

AN EMPIRICAL EXAMINATION OF SERVICE DOMINANT LOGIC:

THE THEORY OF THE NETWORK

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Marketing scholars question the ability of the 4Ps to explain higher order phenomena in modern marketing. Scholars contend that marketing's historical framework, based in product centric economic theory, constrains the 4Ps ability to form a foundation for a general theory of marketing. The focus on value embedded in product fails to explain knowledge-based intangible sources of competitive advantage. In response to this concern a new dominant logic for marketing called service-dominant logic (S-D Logic) has been proposed. However, not all scholars are supportive of S-D Logic. Still nescient, S-D Logic lacks a theoretic model, operationalized constructs, and relationships between those constructs.

This study addresses those deficiencies by:

1. Generation of a grounded theory of a performance-oriented network.
2. Empirical assessment of the S-D Logic literature.
3. Development of an inductively generated theory of S-D Logic to include constructs, relationships, outcomes, and hypothesis.

This investigation provides an important set of research findings. The resultant service-oriented network theory suggests a theoretic structure for S-D Logic. Use of grounded theory provides a strong empirical foundation based in a leading edge multi-national market segment composed corporations and programs worth hundreds of billions of dollars. The analysis drew upon 44 field interviews and follow-up exchanges. Multiple member checking sessions generated practitioner confirmation of the research conclusions.

The work provides actionable theoretical and practical implications. This investigation provides a link between S-D Logic as a foundation for a general theory of marketing and initial model of suggestive of such theory. For the practitioner the service-oriented network model provides actionable constructs. The antecedents identified are largely influencable by inter-firm leadership and provides them a mechanism to tailor the specific service-oriented strategy to support the desired network value propositions.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

Marketing is considered the science of exchange (Alderson, 1957; Kotler, 1972; Kotler & Levy, 1969). According to Hunt (1991) the goal of marketing, as a science, is to explain, predict, and understand marketing phenomena. However, a general theory of marketing, one which is able to explain and predict phenomena, remains elusive (Hunt, 2002; Hunt, 1983; Lusch and Vargo, 2006b; Wilkie and Moore, 1999). More specifically, scholars suggest that marketing research fails to provide a unified marketing theory as to why:

1. Some products fail and others do not (Kerin et al., 1992; Suarez and Lanzolla, 2005);
2. Some customers are satisfied and others are not (Lam et al., 2004; Taylor et al., 2004);
3. Different consumers find differing satisfaction in identical products (Parasuraman et al., 1994b; Zeithaml et al., 1996);
4. With so many new products choices consumers appear increasingly dissatisfied (Prahalad and Ramaswamy, 2004b).

A growing number of marketing scholars contend that marketing's product based economic pedigree limits marketing's ability to develop its own theory (Hunt, 2002; Hunt, 1983; Hunt and Madhavaram, 2006; Lusch and Vargo, 2006b; Wilkie and Moore, 1999). The economic science's product focus, which emphasizes tangible outputs, appears unable to explain much of the higher order phenomena of modern marketing (Lusch and Vargo, 2006b). The product focus of marketing research and practice is evident in marketing's current dominant logic, or framework, known as the 4Ps (Kotler and Armstrong, 2005). The 4Ps (product, price, place and promotion) have served as the dominant logic, or paradigm, from which marketing scholars and practitioners have approached problems and research during the last three and a half decades

(Kotler and Armstrong, 2005; Lusch and Vargo, 2006b). However, there is growing debate as to the adequacy of the 4Ps as a dominant logic for marketing (Vargo and Lusch, 2004a).

Scholars in this debate tend to use the words paradigm, framework, and dominant logic interchangeably (Achrol and Kotler, 2006; Bolton, 2006; Levy, 2006; Vargo et al., 2006; Webster, 2006). Typically the most generally acceptable term is dominant logic. A dominant logic is the worldview through which scholars and practitioners conceptualize the discipline and its problems (Prahalad and Bettis, 1986; Vargo and Lusch, 2004a). Vargo & Lusch (2004a) claim that marketing has evolved over the last 100 years and this evolution, or shift, requires a new way of looking at (i.e., new dominant logic) marketing research and practice.

This evolution in the marketplace has caused scholars to question the adequacy of the 4Ps as the dominant logic for marketing (Lusch and Vargo, 2006b; Vargo and Lusch, 2004a; Wilkie and Moore, 2003). Day and Montgomery (1999, p. 3) claim the 4Ps have become “merely a handy framework.” Vargo & Lusch, (2004a) argue the 4Ps are constrained in a product-centric focus, one which treats the customer as a target of marketing activities. Others contend that the 4 Ps fail to provide an explanatory framework for many of the new marketing variables, such as market orientation (Jaworski and Kohli, 1993; Narver and Slater, 1990), relationship marketing (Morgan and Hunt, 1994; Morgan and Hunt, 1999), supply chain management (Lambert and Garcia-Dastugue, 2006) and marketing strategy (Varadarajan et al., 2001). This concern has generated considerable debate over the requirement for a new dominant logic, and structure of that new logic (Bolton, 2006; Prahalad and Bettis, 1986).

To address this debate Vargo & Lusch (2004a) recently proposed a new dominant logic for marketing called service-dominant (S-D) Logic. S-D Logic represents a shift, or reorientation,

in marketing worldview. This shift moves away from the goods-oriented dominant logic of the 4Ps where the product is embedded with value, to a service-oriented dominant logic where knowledge is the source of source of value (Vargo and Lusch, 2004a). The assertion is that the fundamental resource being exchanged in the market is not tangible goods. The fundamental resources exchanged are intangible skills, knowledge, and relationships aimed to achieve a service requirement (Vargo and Lusch, 2004a).

Yet a dominant logic is not theory, it does not propose constructs, relationships between constructs, or a theoretical model (Prahalad and Bettis, 1986; Vargo and Lusch, 2004a). Rather, a dominant logic provides a framework from which to conceptually approach marketing research and practice. Proponents of S-D Logic, as a new dominant logic, claim S-D Logic more adequately conceptualizes new phenomena in the market place and is thus more comprehending of new marketing variables (Rust, 2004; Vargo and Lusch, 2004a). These proponents assert that S-D Logic has potential as a foundation for a general theory (Lusch and Vargo, 2006b). Although nascent, S-D Logic has accumulated a generous amount of dialog and debate (Lusch and Vargo, 2006c). However, all of literature is not equally supportive of the promise of S-D Logic.

## 1.2 S-D Logic Debate

Many marketing and supply chain scholars are supportive of S-D Logic as a new dominant logic of marketing; optimistic that S-D Logic will foment a general theory of marketing (Bolton, 2006; Lusch and Vargo, 2006b). Other scholars are yet unconvinced, but willing to seek evidence of S-D Logic's authority (Ambler, 2006; Hunt, 2004; Woodruff and Flint, 2006). Others are already dismissive of S-D Logic, alleging S-D Logic offers nothing new, does not go far

enough, and is too firm-centric (Prahalad and Ramaswamy, 2004a; Wilkie and Moore, 2006; Woodruff and Flint, 2006). All agree that S-D Logic is a conceptual model, untested, its boundaries, limitations, and extensions unknown (Webster, 2006).

Despite the ongoing debate S-D Logic has accomplished a significant task already; it has provided the baseline around which scholars can define themselves and their contributions (Webster, 2006). Those scholars supportive of S-D Logic claim it provides a “robust alternative to the traditional view” (Webster, 2006, p. xiv). Some, like Rust (2004), consider S-D Logic “brilliantly insightful”, poised to provide explanation power with respect to key marketing constructs. For these authors S-D Logic provides greater insight and comprehension into knowledge processes (Day, 2004), better explains core competency (Prahalad, 2004a), explains more effectively market orientation (Jaworski and Kohli, 2006), articulates co-creation of value (Lusch and Vargo, 2006a; Oliver, 2006), explains structural changes in the market place (Day, 2006b; Deighton and Narayandas, 2004) and is coherent with tenets of supply chain management (Lambert and Garcia-Dastugue, 2006).

Many are hesitant, but willing to seek evidence of S-D Logic’s authority (Ambler, 2006; Hunt, 2004; Woodruff and Flint, 2006). These scholars are hopeful and pragmatic; acknowledging that the outcome of the S-D Logic debate, and the “shape of the new paradigm, [is] anything but certain” (Webster, 2006, p. xiii). Hunt (2004, p. 22) extols, researchers should give S-D Logic a “careful read and thoughtful evaluation, not a quick skim and hasty judgment.”

Some are dismissive of S-D Logic, finding little of it groundbreaking and limited promise in S-D Logic. These authors argue that S-D Logic, and its firm-centricity, fails to deliver as a “new” dominant logic (Prahalad and Ramaswamy, 2004a). Others find the logic too abstract

(Shugan, 2004), or that S-D Logic simply employs services as a term for value-added (Hunt, 2004; Prahalad and Ramaswamy, 2004a). Some argue that there is no real “reorientation” implied by S-D Logic (Levy, 2006). In all this S-D Logic has generated extensive dialogue, controversy, and debate (Bolton, 2006).

This controversy highlights the conceptual nature of S-D Logic driven by the limited empirical support for its boundaries, limitations, and extensions. At this point “S-D Logic is an open source code”, one that has potential to evolve into a “fully integrative and complete general theory of marketing” (Lusch and Vargo, 2006b, p. 419) The conceptual nature of S-D Logic, and its potential, provide a rich research area in which much theoretical and practical work can be done (Day, 2006b). From a theory perspective S-D Logic is presented as a logically supported new paradigm from which to approach marketing research. As such, S-D Logic has potential as a foundation for development of a general theory (Lusch and Vargo, 2006b). However, as of yet there are no theoretical models supportive of S-D Logic, nor are there defined and operationalized constructs supportive of its premises. From the firm perspective, S-D Logic requires a clear model of its antecedents, processes, and outcomes (Day, 2006b). Without a clear model, one which articulates the processes by which operant resources lead to competitive advantage, firms will be slow to adapt to the strategic prescriptions of S-D Logic (Day, 2006b). Firms burdened by inertia from previous product-centric decisions will find it difficult to unlearn those lessons (Bettis and Prahalad, 1995). Without theoretic explication of S-D Logic, most firms, and most researchers, are unlikely to embrace and extend as argued by Vargo and Lusch (Day, 2006b, p. 88).

### 1.3 Problem Statement

S-D Logic is a conceptual model, untested, and its boundaries, limitations, and extensions unknown (Webster, 2006). Further S-D Logic is proffered as “a foundation for a general theory” (Lusch and Vargo, 2006b, p. 406). However, there is no theoretical model supportive of S-D Logic, no operationalized constructs, nor theoretic relationship between these constructs.

S-D Logic is articulated through nine fundamental premises, as shown in Table one. However the concepts captured by these premises have yet to be operationalized using an empirical investigation. The premises are based in logical argument which positions S-D Logic as a new framework, or paradigm, for conceptualizing marketing research and phenomena (Kuhn, 1996; Vargo and Lusch, 2004a). However, similar logical argument has also been used to refute S-D Logic, and the foundation for its premises (Achrol and Kotler, 2006). Without inductive support, generated through empirical investigation, the S-D Logic debate remains a stalemate, each side rearticulating its arguments, no new ground taken.



Table 1

Fundamental Premises of S-D Logic (Vargo and Lusch, 2004a)

FP1	The application of specialized Skills and Knowledge is the Fundamental Unit of Exchange
FP2	Indirect Exchange Masks the Fundamental Unit of Exchange
FP3	Goods are Distribution Mechanisms for Service Provisions
FP4	Knowledge is the Fundamental Source of Competitive Advantage
FP5	All Economies are Service Economies
FP6	The customer is always a co-producer (co-creator)
FP7	The enterprise can only make value propositions
FP8	A Service-Centered View Is Customer Oriented and Relational
FP9	Organizations exist to integrate and transform microspecialized competences into complex services that are demanded in the marketplace.

The next step in the S-D Logic debate is an empirical investigation; one that adopts an inductive approach grounded in observational data (Gummesson, 2004). The grounded theory methodology is specifically designed to identify a sample from which to emerge constructs and posit theoretic relationships (Charmaz, 2006). Grounded theory provides a rational empirical foundation to assess the premises of S-D Logic, and the debate surrounding S-D Logic. Construct development and identification of antecedents, processes, and outcomes of an S-D coherent theoretic model is a logical precursor to quantitative validation of S-D Logic. Development of constructs and relationships promises to increase understanding of the boundaries, limitations, and extensions of S-D Logic; as Webster states “the final outcome of that debate, and the shape of the new paradigm, is anything but certain” (Webster, 2006, p. xiii).

#### 1.4 Research Design

This research uses grounded theory to explicate the boundaries, limitations, and extensions of S-D Logic in a sample pursuing a performance-centric logistics strategy. Table 2 provides a general outline of the strategy adopted in this investigation.

Table 2  
Structure of the Investigation

<p>1. Problem Statement:</p> <ul style="list-style-type: none"> <li>a. S-D is presented as the new dominant logic of marketing. However, its boundaries limitations and extension remain unknown.</li> <li>b. Further S-D Logic is presented as a foundation for a general theory. However, such theory lacks a theoretic model, operationalized constructs, and theoretical relationship between these constructs.</li> </ul>
<p>2. Role of Literature Review:</p> <ul style="list-style-type: none"> <li>a. S-D Logic, its fundamental premises, and its debate provide an initial focus for a grounded theory investigation.</li> <li>b. This literature provides a mechanism to qualify as sample rich in S-D Logic like phenomena.</li> <li>c. The literature also provides initial scope for interview questions. However, these initial interview questions do not constrain the investigation. Once the, empirical investigation is under way the data and the emergent results reshape the direction in which the investigation continues. Researcher will amend questions and directions based upon the empirical data</li> </ul>
<p>3. Grounded theory method:</p> <ul style="list-style-type: none"> <li>a. Using the method of constant comparison and theoretical sampling (see method) constructs emerge and relationships between constructs in a sample potentially rich in S-D Logic like phenomena.</li> <li>b. The resultant grounded theory potentially identifies core process, antecedents, and outcomes of an S-D Logic congruent theory.</li> </ul>
<p>4. The analysis follows the conceptual guidance of Glaser &amp; Straus (1967b), Glaser (1992; 1978) and used the specific application of Charmaz (2006). The analysis approach is:</p> <ul style="list-style-type: none"> <li>a. The first section provides a description of the analytical process of constant comparison employed. This section provides explication of coding, memo writing, sampling, saturation, and sorting.</li> <li>b. The second section presents the emergent theory. The performance-centric grounded theory is presented as a theoretical framework. The categories, their relationship, and propositions are presented.</li> <li>c. The third section uses the emerged grounded theory to inform an assessment of the S-D Logic premises and debate. In this section the grounded theory informs an assessment of the boundaries, limitations, and extensions of S-D Logic.</li> <li>d. The fourth section presents a suggested model of S-D Logic to include constructs, relationships, and outcome.</li> </ul>
<p>5. Implications for future research: The analysis evaluates a grounded theory emerged in a sample rich in S-D Logic like phenomena. This grounded theory is positioned for follow-on deductive quantitative investigation supportive of greater generalization.</p>

Grounded theory provides a mechanism to emerge constructs, and relationships between these constructs, supportive of theory generation (Glaser and Strauss, 1967b). The method employed in this grounded theory investigation aims to emote description, dimension, and the relationships between constructs reflective of the central premises of S-D Logic. This is accomplished using field observation of five, multi-billion dollar, Department of Defense (DoD) programs executing a performance-oriented logistics strategy known as performance based logistics (PBL). Grounded theory generates theoretical relationships between constructs. Theory emerged in such a manner provides a methodology, and vehicle, for examination of the literature debate surrounding S-D Logic in order to determine its boundaries, limitations, and extensions.

The S-D Logic literature frames the interview guide and sample selection. The literature, in grounded theory, provides a lens through which the work can be initially focused (Charmaz, 2006; Glaser, 1992; Glaser, 1998). However, such focus does not constrain, or presuppose, the direction of the investigation. Grounded theory provides strong methodology in which the data speak for themselves (Glaser and Strauss, 1967b; Strauss and Corbin, 1998). The outcome, an inductively derived grounded theory, provides a theoretical model from which to analyze the S-D Logic debate.

As such, this investigation explores the potential of “S-D Logic as the foundation for a general theory” (Lusch and Vargo, 2006b, p. 406). Starting with S-D Logic as an initial lens (Charmaz, 2006), this investigation aims to derive a grounded theory of exchange using a number of organizations engaged in a performance-centric strategy. The empirical inductive

nature of this investigation promises to illuminate the boundaries, limitations, and extensions of S-D Logic.

For those pragmatists awaiting demonstration of the authority of S-D Logic this investigation promises observational and empirical data. If, as some contend, S-D Logic is limited by firm-centrality of its suppositions, or is merely a restatement of the old, this illumination should give form to these contrarian comments. If S-D Logic provides a foundation for a general theory of marketing, then this investigation, based in an S-D like environment, should elucidate the key process, antecedents, and outcomes supportive of such theory of exchange. The analysis follows the conceptual guidance of Glaser & Strauss (1967b), Glaser (1992; 1978) and used the specific application of Charmaz (2006). The analysis approach is:

1. The first section provides a description of the analytical process of constant comparison employed. This section provides explication of coding, memo writing, sampling, saturation, and sorting.
2. The second section presents the emergent theory. The performance-centric grounded theory is presented as a theoretical framework. The categories, their relationship, and propositions are presented.
3. The third section uses the emerged grounded theory to inform an assessment of the S-D Logic premises and debate. In this section the grounded theory informs an assessment of the boundaries, limitations, and extensions of S-D Logic.
4. The fourth section presents a suggested model of S-D Logic to include constructs, relationships, and outcome.

Grounded theory (Glaser, 1992; Glaser, 1998; Glaser and Strauss, 1967a) methodology allows investigation into the possible operationalization of the fundamental premises associated with S-D Logic. Some argue S-D Logic represents structural changes emerging in the market (Day, 2006b). As such grounded theory, based in a sample exhibiting similar environmentally driven structural changes, promises to provide emerged constructs coherent with a critique of the fundamental premises of S-D Logic.

Grounded theory derives constructs by developing conceptual categories using constant comparison across multiple facets of the sample (Glaser, 1992; Glaser, 1978). Yet, grounded theory goes beyond mere description of the phenomena. This is accomplished by explicating the underlying structure, and dimensionality, associated with the emerged constructs (Charmaz, 2006). Examining multiple organizations, each situated in an S-D Logic like environment, provides different views of constructs. These contrasting and complementary views generate insight into the underlying structure of an S-D Logic like organization. Contrasting multiple samples, each engaged in a performance-oriented strategy, thus provides dimensionality for the emerging constructs.

Grounded theory moves beyond descriptive analysis by inductively deriving the relationships between the emerged constructs (Charmaz, 2006). The use of multiple organizations, comparing and contrasting observation, and illumination of construct dimensionality allows for the development of relational statements between key constructs. This process generates a theoretical model describing the antecedents, key process, and outcomes based upon the emerged constructs. To this end, this investigation must first determine the similarity in environmental antecedents generating the shift to performance-centric logistics strategies and the structural changes in the market claimed to be explained by S-D Logic.

#### 1.5 S-D Logic and Performance Based Logistics (PBL)

The goal of grounded theory method is to emerge theory (in this case framed by S-D Logic) in environments (in this case organizations engaged in a performance-oriented strategy) likely to exhibit the phenomena (premises of S-D Logic) of interest (Glaser, 1992; Glaser, 1998).

Unlike quantitative methodology, where the sample is hoped to support generalizability, the grounded theory sample is chosen with a goal of generating observational data from which to emerge constructs in support of theory development. As such, the goal of the literature review, with respect to PBL, is to determine if there is sufficient reason to believe that organizations engaged in a PBL strategy are doing so as a result of S-D Logic similar “structural changes in the underlying system” (Rust, 2004, p. 24). If so then PBL provides a rational sample from which to emerge constructs supportive of an investigation into S-D Logic.

The samples under study involve DoD aircraft programs adopting performance-centric logistics strategies. These programs face environmental antecedents similar to the evolving market place as explained by S-D Logic. For instance, those arguing the requirement for a new dominant logic for marketing assert that the market environment is evolving in the following manner:

1. Highly demanding, uncertain, and information intensive (Day, 2004; Day, 2006b)
2. A focus on effect based upon information and knowledge, and less on physical benefit (Rust and Thompson, 2006)
3. The generation of solutions (Day, 2004; Sharma et al., 2002)
4. The convergence of supply chain management and marketing theory (Flint and Mentzer, 2006; Lambert and Garcia-Dastugue, 2006; Rust, 2004)
5. The rise enabled exchange (Day, 2006b; Hunt, 2000)

The environmental changes explained by S-D Logic are very similar to those driving new DoD weapon system performance-oriented sustainment strategies. Like S-D Logic, DoD’s environment is forcing evolution toward a new sustainment strategy, one focused on creation of aggregate performance and away from repair and return of products (Pagonis, 2004; Wolfowitz, 2004). Like S-D Logic, the strategic “cornerstone of PBL is the purchase of weapon system sustainment as an integrated package based on output measures such as system

availability, rather than input measures, such as parts and technical services” (Wolfowitz, 2004, p. 2). Like S-D Logic, the goal of a performance-performance PBL strategy is an outcome based satisfaction which transcends mere product focus (Berkson, 2005).

The S-D Logic literature, when compared with PBL guidance, and initial interviews, indicate that organizations engaged in a performance-oriented PBL strategy may provide a leading edge, highly visible, insight into what is occurring in the overall market. The use of the term “performance” appears conceptually similar to service. Those transitioning to a performance-oriented strategy routinely make refer to a product-performance distinction. Further, performance for these practitioners represents the true and continuing value that is transmitted through the product and network relationships.

The “engine” of a performance strategy is knowledge. The initial interviews revealed that the shift to performance strategy is largely supported by information systems and tools that allow the network to leverage knowledge to increase value. This makes PBL an excellent environment from which to empirically investigate the S-D Logic debate. PBL provides a rational sample to answer the pragmatic questions concerning boundaries, limitations, and extensions of S-D Logic. Initial review finds that PBL has much in common with the fundamental tenets of S-D Logic. This method (grounded theory), and this sample (DoD PBL), support’s calls for explication of processes, constructs, and relationships of S-D Logic (Vargo and Lusch, 2004, 2006, Bolton 2006, Webster 2006, Day 2006).

## 1.6 Scope and Limitations

This effort looks to find emergent theory based upon empirical observation of organizations engaged in performance based logistics. The environment of PBL appears similar

to that explained by S-D Logic. As such this research aims to provide empirical, inductive, support for constructs and relationships framed by the premises of S-D Logic. Consequently, the investigation looks to emerge a grounded theory explicating the antecedents, processes, and outcomes of an organizational strategy rich in S-D Logic like phenomena. If S-D Logic, as posited by its supporters, provides a “foundation for a general theory” (Lusch and Vargo, 2006b, p. 406), then this investigation is well positioned, and designed, to provide evidence of such theory. Additionally this work is expected to provide a general model supportive of performance-centric logistics strategies, such as PBL, for use in practice.

While grounded theory is appropriate for the current investigation, it does have limitations. The goal of grounded theory is to inductively educe theory from a sample rich in the phenomena under question (Strauss and Corbin, 1998). Inductively derived theory is specific to the sample and untested for generalizability (Strauss and Corbin, 1998). The theory emerged in this work will require subsequent follow-on deductive investigation through which its generalizability is established (Strauss and Corbin, 1998).

### 1.7 Theoretical Implications

Theory development using grounded theory method has significant theoretical implication (Glaser and Strauss, 1967b). This research aims to emerge theory from a performance-oriented sample from which inform the debate surrounding the fundamental premises of S-D Logic, and proffer theoretic relationships between emerged constructs. The goal of this investigation is to develop an empirically testable model framed by the S-D Logic debate. The grounded theory methodology promises to inductively derive such a theoretical model coherent with the S-D Logic debate using organizations engaged in performance-centric



PBL strategies. Grounded theory moves beyond classic qualitative description by positing theoretic relationships between the operationalized constructs. This methodology aims to provide an actionable model underlying processes of a performance-oriented strategy. Such a model promises to illuminate the antecedents, key processes, and outcomes of a performance-centric strategy. Subsequent analysis of this model aims to identify the boundaries, limitations, and extension of S-D Logic. Inherent in this analysis is an investigation into S-D Logic as a potential foundation for a general theory (Lusch and Vargo, 2006b).

### 1.8 Practical Implications

The study of performance-centric logistics strategies, such as PBL, has rich practical applications and has generated interest from industry (major US and European aerospace firms) as well as government organizations (Berkson, 2005; Cothran, 2006). PBL, a broad grouping of multi-billion dollar supply chain management strategies, contains opportunities for research, education, executive education, and policy (Berkson, 2005; Cothran, 2006; Pagonis, 2004). PBL presents a strategy that integrates supply chain and marketing management strategies of the supplier and focal firm with outcome-based customer performance requirements. This is a growth area; multi-government / industry teams are increasing their cooperative weapons system development and sustainment strategies.

Grounded theory, generated through field observations, is comprehensible by both researchers and practitioners. This is because grounded theory emerges variables and constructs meaningful to practitioners (Brown, 2005; Strauss and Corbin, 1998). Additionally, grounded theory “provides us with relevant predictions, explanations, interpretations and application” (Glaser and Straus 2006) of how performance-based PBL strategies work.

Those senior DoD leaders supportive of this study specifically called for answers to very direct question, of very real interest, to the DoD, its Allies and major weapons system contractors. These questions are:

1. How do PBL implementations differ between the DoD, contractors, and vendors?
2. What changes are recommended for organizing and implementing PBL efforts?
3. What contributes to the long-term success of a PBL effort--how can these initiatives be sustained over time?
4. What metrics incentivize behavior oriented toward knowledge sharing (customer and suppliers) aimed at making better decision and improving process to decrease cost and improve performance?
5. How can market based (competitive environment) business theories be adopted and adapted by DoD sustainment?
6. What is the relationship between cost and performance?

### 1.9 Summary and Implication

Grounded theory methodology provides support for significant follow-on deductive investigation. The constructs developed, and their theoretic relationships, lend themselves well to propositions testing and instrument development. This method is similar to that employed by Kohli and Jaworski (1990) studying market orientation and Parasuraman et al (1988) studying service quality. The methodology promises to spur further theory development. Lastly, this investigation appears to be the first of its kind using grounded theory, supported by MAXQDA software, to investigate supply chain management.

We must work to advocate a proper balance of rigor and relevance, both theoretical and practical, and bring to bear the results of scholarship (Webster, 2006, p. 6).

Similarity of environment appears to be creating overlap between DoD PBL guidance and execution, and theories of the firm emerging in business research. From a theoretical perspective this investigation attempts to define initial constructs and relationships of a performance-oriented strategy. As such, the study defines boundaries, limitations, and

extensions of the S-D Logic framework. This is accomplished through an explicit grounded theory methodology. This methodology promises to provide a degree of validation of S-D Logic in DoD programs acknowledged as rich, leading edge, examples of emergent performance-centric business logistic concepts. From a practical perspective the identification of key PBL antecedents and processes (emergent constructs of PBL), and the consequences of these processes allows greater performance and lower costs. PBL may very well be the “steam engine” from which we learn the authenticity of S-D Logic and its foundation as a general theory.

This dissertation is organized in the following manner. Chapter II provides an overview of the literature in order to develop the controversy surrounding S-D Logic. In chapter three the method is developed. Chapter IV contains analysis and results. Chapter V provides a discussion of the identified theoretical and practical implications of the study results, limitations and suggestions for future research.

## CHAPTER 2

### LITERATURE REVIEW

This section begins with a brief discussion of the role of the literature review in grounded theory. Next S-D Logic is presented. In this section the concept of, and the logical support for, S-D Logic is presented. Also presented is a discussion of the fundamental premises of S-D Logic. Following this, the debate surrounding S-D Logic is scrutinized. In these sections, arguments supportive, dismissive, and pragmatic with respect to S-D Logic are considered. Lastly, background on Performance Based Logistics is overviewed.

#### 2.1 Role of Literature Review in Grounded Theory

The objective of the literature in grounded theory is to provide a framework for initial conceptualization of the research (Charmaz, 2006). In addition the literature is used to evaluate and critique the appropriateness of the sample as supportive of the proposed grounded theory development (Charmaz, 2006; Glaser, 1992). Therefore, the literature review presented hereafter focuses on the development of the literature to support a grounded theory exploration of S-D Logic in a government/industry setting known for its Performance Based Logistics (PBL) management strategies (Secretary of the Air Force Installation and Logistics and Secretary of the Air Force for Acquisition, 2006).

#### 2.2 Service Dominant Logic

S-D Logic asserts that marketing has evolved over the previous 100 years (Vargo and Lusch, 2004a). Vargo & Lusch (2004a) center the nature of this evolution discussion by focusing on knowledge as a source of value. The core supposition in S-D Logic is that marketing is moving “from a goods-dominated view, in which transactions were central, to a service–dominant view,

in which intangibility, exchange processes, and relationships are central” (Vargo and Lusch, 2004a, p. 2). Table 3 contrasts good and service-centered views of value of knowledge.

Table 3  
Operand and Operant Resources Help Distinguish the Logic of the Goods and Service Centered Views (Vargo and Lusch, 2004a, p. 7)

	Traditional goods-centered dominant logic.	Emerging service-centered dominant logic.
1. Primary unit of exchange	People exchange for goods. These goods serve as primarily operand resources.	People exchange to acquire the benefits of specialized competences (Knowledge and Skills), or services. Knowledge and skills are operant resources.
2. Role of goods	Goods are operand resources and end products. Marketers take matter and change its form, place, time, and possession.	Goods are transmitters of operant resources (embedded knowledge); they are intermediate “products” that are used by other resources (customers) as appliances in value creation processes.
3. Role of customer	The customer is the recipient of goods. Marketers do things to customers; they segment them, penetrate them, distribute to them, and promote to them. The customer is an operand resource.	The customer is a co producer of service. Marketing is a process of doing things in interaction with the customer. The customer is primarily an operant resource, only functioning occasionally as an operand resource.
4. Determination and meaning of value	Value is determined by the producer. It is embedded in the operand resource(goods) and is defined in terms of “exchange-value.”	Value is perceived and determined by the consumer on the basis of “value in use.” Value results from the beneficial application of operant resources sometimes transmitted through operand resources. Firms can only make value propositions.
5. Firm-customer interaction	The customer is an operand resource. Customers are acted on to create transactions with resources.	The customer is primarily an operant resource. Customers are active participants in relational exchanges and co-production.
6. Source of economic growth	Wealth is obtained from surplus tangible resources and goods. Wealth consists of owning, controlling, and producing operand resources.	Wealth is obtained through the application and exchange of specialized knowledge and skills. It represents the right to the future use of operant resources.

### 2.2.1 Explication of S-D Logic Concept

Historically, marketing focused on tangible goods as the unit of exchange (Vargo et al., 2006; Wilkie and Moore, 2003). Under this perspective the value of tangible goods was based in classical economic terms of land, labor, and capital (Smith, 1776). Tangible goods represent outcome of production and distribution processes that embed value in the consumable good (Shaw, 1912; Shaw, 1916; Vargo and Lusch, 2004a). Alternatively, S-D Logic embraces intangible resources, such as skills, knowledge and processes, as the fundamental source of value. It is the distinction in resource definition between operand (tangible) and operant (intangible) resources which provides the fundamental insight into the evolution towards a service-centered logic (Vargo and Lusch, 2004a).

Operand resources are those tangible assets that are factors of production (Vargo and Lusch, 2004a). In a goods-centered logic, operand resources are the primary source of competitive advantage (Vargo and Lusch, 2004a). Operand resources find their roots in Smith's (1776) conceptualization of value as embedded in the product. In a goods-centered perspective, the "customers, like resources, became something to be captured or acted upon" (Vargo and Lusch, 2004a, p. 2).

There are five aspects to the goods-oriented perspective: 1) economic activity is to make and distribute goods, 2) value is embedded in goods, 3) firms function to optimize production variables, 4) maximum efficiency is achieved through standardization, and 5) unsold goods retain value (Vargo and Lusch, 2004a, p. 5). These goods-oriented aspects limit marketing

both functionally and as a force in market strategy making at the firm / inter-firm level (Noble, 1999; Noble and Mokwa, 1999; Vargo and Lusch, 2004a; Vorhies and Morgan, 2003).

Conversely, operant resources are “resources that produce effects” (Vargo and Lusch, 2004a, p. 2). Operant resources are skills and knowledge that act upon operand resources: “operand resources are often invisible and intangible; often they are core competencies or organizational processes” (Vargo and Lusch, 2004a, p. 3). This differentiation provides an explanatory framework capable of rationalizing the incongruency between capital valuation of a company and market valuation through stock prices (Srivastava et al., 1998; Srivastava et al., 1999). The idea of operant resources provides explanation for the enduring strength of the US economy while faced with continual trade deficits (Vargo and Lusch, 2004a; Vargo et al., 2006).

In a service-oriented logic: 1) knowledge is the source of competitive advantage, 2) efficiency is achieved through optimizing relationships benefited by knowledge competency, 3) customers are co-producers of competitive offerings, and 4) financial performance is driven by endogenous growth (Vargo and Lusch, 2004a, p. 5). Thus, the service-oriented view comprehends the goods-oriented view as a specific and limited case. By this construction, S-D Logic is coherent with resource-advantage theory and core competency theory (Hunt, 2000; Prahalad and Hamel, 1990; Vargo and Lusch, 2004a).

Armed with logical argument support of the general contrast between goods and service-centric views Vargo and Lusch present the 9 fundamental premises of S-D Logic (Vargo and Lusch, 2004a). The 9 FPs (shown in Table 1) are considered complementary to the six differences presented in Table 3. Taken together, the FPs and the six differences “present the patchwork of the emerging dominant logic” (Vargo and Lusch, 2004a, p. 6).

### 2.2.2 Nine Fundamental Premises of S-D Logic

The FPs provide the abstract conceptual structure of S-D Logic. Much of the support for S-D Logic is based upon logical argument favoring the ability of the FPs to provide an explanatory framework explaining current market phenomena. The fundamental premises provide a baseline for the analysis in this investigation. Table 1 provides a summary of the FPs.

FP<sub>1</sub>: The application of specialized skills and knowledge is the fundamental unit of exchange.

Value is most accurately measured in use; it is in the application of operant resources through servicing of needs that customer satisfaction is manifest (Vargo and Lusch, 2004a). It is satisfaction of service requirements, whether through direct service (such as application of transportation service), or through service accommodated by product (provision of a self drive automobile), that forms the fundamental unit of exchange (Vargo and Lusch, 2004a). This value in use is also a key criticism offered by Prahalad & Ramaswamy (2004a) who argue an experience-centered logic.

FP<sub>2</sub>: Indirect exchange masks the fundamental unit of exchange.

Micro specialization and monetization of the market (indirect exchange) masks the fundamental unit of exchange; “money, goods, organizations, and vertical marketing systems are only the exchange vehicles” (Vargo and Lusch, 2004a, p. 8). Industrial production efficiencies distanced those performing tasks from contact with the customer. Those involved as micro specialists seldom have a view of the entire product. Microspecialist are indirectly compensated by the market through salary paid by the organization (Vargo and Lusch, 2004a). This structure, unchecked, fosters slow degradation in quality to both internal and external



customers. The rise of quality management was meant to overcome this negativity and instill accountability for product quality into entities separated from customer contact due to micro specialization (Deming, 1982; Vargo and Lusch, 2004a).

FP<sub>3</sub>: Goods are distribution mechanisms for service provisions.

Initially, marketing focused on distribution and the exchange of goods (Alderson, 1957; Shaw, 1916; Vargo and Lusch, 2004a). The market is now centered on the application of “specialized knowledge, mental skills, and to a lesser extent, physical skills” (Vargo and Lusch, 2004a, p. 8):

People often purchase goods because owning them, displaying them, and experiencing them (e.g. enjoying knowing that they have a sports car in the garage, showing it off to others, and experiencing its handling ability) provides satisfaction beyond those associated with the basic functions of the product (e.g. transportation) (Vargo and Lusch, 2004a, p. 9).

Adopting this perspective goods serve as a vehicle around which operant resources are exchanged with the consumer to satisfy higher order needs.

FP<sub>4</sub>: Knowledge is the fundamental source of competitive advantage.

Knowledge, an operant resource, is at the core of competitive advantage (Vargo and Lusch, 2004a). The application of specialized skills and knowledge is the fundamental unit of exchange. Market based knowledge and core competency intertwine to form the basis of competitive advantage. Further, “knowledge as the basis for competitive advantage can be extended to the entire supply chain” (Vargo and Lusch, 2004a, p. 9). Vargo and Lusch (2004a) argue that the primary inter-firm flow is knowledge with or without accompanying product. It is through knowledge that firms, aligned with partners, bring value to consumers. In S-D Logic, competitive advantage is based in operant resources and management’s function to co-create

processes with customers that utilize these operant resources. Knowledge, through co-creation, appears to be the essence of the S-D Logic framework.

FP<sub>5</sub>: All Economies are service economies.

Economics as a science is grounded in Smith's (1776) narrow concern with manufactured output. This preoccupation led to a focus on efficiency and micro-specialization. In turn this led to an increase in outsourcing. This outsourcing distorts national economic accounting. Tasks performed as elements of production are now outsourced skills, once outsourced many of these tasks are accounted for as services (Vargo and Lusch, 2004a). If such skills had remained vertically integrated within the firm, they would be considered part of production costs (Vargo and Lusch, 2004a). At a macro level, the trend toward specialized outsourced skills, *service*, evolves the overall economy towards a service economy (Vargo and Lusch, 2004a).

FP<sub>6</sub>: The customer is always a co-producer (co-creator).

The customer is the target of production in the goods-oriented view. The firm combines microspecialized activities well away from the customer in order to achieve "maximum manufacturing efficiency" (Vargo and Lusch, 2004a, p. 18). Customer responsiveness, and customer orientation is posited as the normative goal for modern marketing constructs (Kohli and Jaworski, 1990; Levitt, 1960; Narver and Slater, 1990; Vargo and Lusch, 2004a). This customer orientation has led to a focus on adapting to current customer needs while anticipating future needs. In this perspective, production is an intermediary process. For instance, durable goods can be considered a service delivery mechanism. The product is designed, such as a washing machine, to provide a service. Additionally, even with such durable

goods, the product is surrounded by service such as learning to use, repair, and adapt to unique needs (Vargo and Lusch, 2004a). This leads to an increase in the demand of real time marketing that “integrates mass customization and relationship marketing” (Vargo and Lusch, 2004a, p. 11). In the goods-oriented view the customer is the target of the firm’s activities. In a service-oriented view the customer is a co-creator of the network value proposition.

FP<sub>7</sub>: The enterprise can only make value propositions

The classical economic view holds that marketing provides a value added function (4Ps) in addition to the value embedded through production (Vargo and Lusch, 2004a). However customer orientation infers a more dyadic sense of co-created value propositions as articulated by S-D Logic (Vargo and Lusch, 2004a). S-D Logic holds that value is in co-creation, coupled with customer acceptance of value proposition. This implies the firm can only offer value propositions (Vargo and Lusch, 2004a). .

FP<sub>8</sub>: A service-centered view is customer oriented and relational

Vargo (2004a, p. 11) and Lusch assert that the service-oriented view is “interactivity, integration, customization, and co-production.” These are inherently customer focused and relational. Doing things not just for, but also with customers, provides a balanced-centricity. Modern production economies obscure the inferred relational aspects inherent in pre-industrial exchange:

Marketing, engineering, and manufacturing were integrated-in the same individual. If a knight wanted armor, he talked directly to the armorer, who translated the knight's desires into a product, the two might discuss the material-plate rather than chain armor-and details like fluted surface for greater bending strength. Then the armorer would design the production process. (Vargo and Lusch, 2004a, p. 20).

The service-centered view is “participatory and dynamic”, it hinges upon co-creation through learning (Vargo and Lusch, 2004a, p. 11). For S-D Logic the market has transitioned from a “product and production focus to a consumer focus and, more recently, from transaction focus to a relationship focus” (Vargo and Lusch, 2004a, p. 20). This requires, at the aggregate, relational structures supportive of knowledge sharing, dissemination, and response.

FP9: Organizations exist to integrate and transform micro-specialized competences into complex services that are demanded in the marketplace.

In 2006 Vargo and Lusch (2006) added a ninth fundamental premise. This premise addressed the role of integrating resources. They claim it is integration that motivates and facilitates exchange. While initially aimed at the micro-marketing structural role of integrator, Vargo and Lusch assert that this integration function is “equally applicable to individuals and households, or more generally all economic entities are resource integrators” (Lusch and Vargo, 2006a, p. 283). Vargo and Lusch (2006) contend that micro-specialization requires integration, that is the bundling of resources to create service people want. This premise brings together co-creation (understanding what people want) and integration (bringing together micro-specialist) to satisfy performance requirements. Vargo and Lusch (2006, p. 53) argue that this premise may very well “provide a framework for a theory of the firm.”

### 2.3 S-D Logic Debate

Although nascent, S-D Logic has accumulated a generous amount of dialog and debate (Lusch and Vargo, 2006c). Those positing the emergence of a new dominant logic assert that the 4Ps have become “merely a handy framework” (Day and Montgomery, 1999, p. 3). They argue this framework is constrained by a product-centric focus (Vargo and Lusch, 2004a) that

treats the customer as a target of marketing activities (Kotler and Armstrong, 2005; Vargo and Lusch, 2004a). These scholars argue that the 4Ps fail to provide an explanatory framework for many of the new marketing variables, such as market orientation (Jaworski and Kohli, 1993; Narver and Slater, 1990), relationship marketing (Morgan and Hunt, 1994; Morgan and Hunt, 1999), supply chain management (Lambert and Garcia-Dastugue, 2006) and marketing strategy (Varadarajan et al., 2001).

### 2.3.1 The First Camp: Those Supportive

A number of scholars find great promise in S-D Logic's potential to provide a "robust alternative to the traditional view" (Webster, 2006, p. xiv). Some, like Rust (2004), consider S-D Logic "brilliantly insightful," capable of providing a framework to explain key marketing constructs. For these authors S-D Logic is historically accurate (Wilkie and Moore, 2003), provides insight and comprehension of knowledge process (Day, 2004), is coherent with respect to structural changes in the market place and supply chain management (Deighton and Narayandas, 2004; Lambert and Garcia-Dastugue, 2006; Rust, 2004), explains core competency (Prahalad, 2004a), explicates more effectively market orientation (Jaworski and Kohli, 2006), and articulates co-creation of value (Oliver, 2006).

Morgan joins Vargo and Lusch (Vargo et al., 2006) in asserting that S-D Logic provides a rational interpretation of the evolution in marketing thought over the last century. S-D Logic appears to appropriately integrate the exchange paradigm while at the same time reinterpreting the 4 eras of marketing (Wilkie and Moore, 2006; Wilkie and Moore, 2003). S-D Logic explains the early success of Smith's (1776) theories of value in production; yet still argues the need for a more appropriate paradigm (Kuhn, 1996).

Rust (2004, p. 23) calls S-D Logic “brilliantly insightful.” He finds S-D Logic effectively captures structural changes occurring in the market place. Like Day (2004), Rust finds these structural changes are driven by knowledge and knowledge supportive systems. Rust (2004) sees the service revolution intractably linked with the information revolution. This confluence presents the researcher an ability to forecast the future of marketing more confidently. Logically, if information technology continues to advance, the shift towards service should also intensify (Rust, 2004).

Rust (2004) sees in this evolution a growing symmetry linking marketing and supply chain management. He argues business to business marketing as a leading edge source of many new marketing variables “due to its relationship intensiveness and its customer databases” (Rust, 2004, p. 25). The key attribute emerging in B2B is the ability to convert information to knowledge and effectively manage relationships. Like Day (2006b), Rust (2004) asserts that the primary reason for the shift is information technology and its ability to “understand and enhance customer relationships” (Rust, 2004, p. 25). Rust (2004) believes that supply chain management provide significant validation of S-D Logic. He believes the information and knowledge intensive demands in supply chain management provides a leading environment emerging an S-D Logic like structure (Rust, 2004, p. 25). For Rust (2004), marketing is entering a new era, one that is well articulated by S-D Logic. This era will closely “resemble the business-to-business/service/relationship marketing of today” (Rust, 2004, p. 25).

Day (2006b) finds S-D Logic appropriately captures the evolution in knowledge processes transforming the market place. Day (2006b) believes the sources of advantage in this market place are knowledge enabled, customized offerings, realized through relational

exchange supportive of the concept of co-production. In this S-D Logic and its emphasis on knowledge are consistent with the competency based view of the firm (Prahalad and Hamel, 1990). According to Day (2006b) strong advantage occurs when customers “make mutual commitments through their engagement in the value-creation process.” The co-creation, performance-oriented nature of S-D Logic is supported by the fact that “Sixty-three percent of the Fortune 100 already claim to offer solutions” (Sharma et al., 2002, p. 3).

Jaworski and Kohli (2006) find S-D Logic extends ideas of customer orientation. They applaud conceptualizing the consumer as an active co-creator, where the “the firm and the customers do the asking, listening, observing and experimenting; that is, the firm and the customers engage in learning” (Jaworski and Kohli, 2006, p. 111). They assert that the network *and* the customers perform value creating activities (Jaworski and Kohli, 2006). Jaworski and Kohli (2006) offer insight into the process of co-creation and when not to co-create.

Deighton and Narayandas (2004) use a case example to suggest the verisimilitude of S-D Logic. They compared two software firms competing in the mid 1990’s. Their case approach positions one firm as adopting a goods-oriented view, while the other adopts a more service-oriented logic (Deighton and Narayandas, 2004). Deighton and Narayandas (2004) find that the successful firm adopted a number of practices congruent with the fundamental premises of S-D Logic, particularly co-creation and the role of knowledge processes (Deighton and Narayandas, 2004).

Gummesson (2004) concurs that the market, as indicated by S-D Logic, has adopted a focus on the interaction between exchange partners. He argues that ideas of consumption and production are limited and that it is the third element, interaction, that addresses this

limitation. Interaction, he argues, is the key property of S-D Logic, and it is through interactions that “parties become partners” (Gummesson, 2004, p. 20). Although inclined towards S-D Logic, Gummesson (2004, p. 21) asks for facts and metrics supportive of the premises of S-D Logic. For Gummesson (2004) an appropriate instigation of S-D Logic requires inductive techniques:

Piecemeal surveys of limited data based on arbitrary assumptions and narrow operationalizations of variables are not sufficient. To begin with, marketers need to do as V&L [Vargo & Lusch] advocate: reinvent marketing theory to fit the present and the future.

Shugan (2004) agrees that marketing must adopt a new paradigm. He asserts that marketing must evolve. He notes that while many top officers in the consumer package goods industry have a marketing background, these industries are stagnant. Conversely, in service oriented industries (i.e., finance, law, operations) “other backgrounds prevail” (Shugan, 2004). Shugan (2004, p. 25) suggest this phenomena is also occurring in the marketing academy, he is concerned for “marketing doctoral students who face competition from non-marketing doctoral students”. According to Shogun (2004), marketing must make greater strides to coexist with finance and operations. For Shugan (2004), the success of S-D Logic will reside in its ability to provide a framework to broaden marketing’s perspective and interactions with non-marketing disciplines. Shugan (2004, p. 25) provides an exhaustive list, as shown in Table 4, supporting further research in this area based upon the framework of S-D Logic.



Table 4  
Shugan's (2004): Challenges to Extend Prior Work

- Implementing marketing strategy in an operations-dominated environment (e.g., Eliashberg et al. 2001)
- Measuring the impact of marketing strategies on short- and long-term profits (e.g., Leeflang and Wittink 2000);
- Managing demand and enhancing profits, given capacity constraints;
- Developing new services in which implementation is more critical than design;
- Developing recovery systems for mitigating almost-certain failures in service delivery systems (e.g., Hart, Heskett, and Sasser 1990);
- Making personal selling more effective by adding service;
- Developing marketing strategies for exploiting seasonality and diminishing its deleterious impact on server capacity(e.g., Radas and Shugan 1998);
- Increasing sales and profits when teams deliver the service;
- Marketing when third parties pay for the service or evaluate it (Eliashberg and Shugan 1997);
- Using marketing to train effectively and to retain employees;
- Marketing more effectively information services, entertainment, and services with low marginal costs;
- Developing highly profitable ancillary services to complement low-margin core services (e.g., concessions at movie theaters);
- Balancing self-service and employee-delivered service;
- Determining the optimal amount of customization (e.g., Anderson, Fornell, and Rust 1997) in a rate-based pricing environment;
- Developing internal marketing programs to motivate service employees;
- Determining when and how to advance sell services (Moe and Fader 2002; Xie and Shugan 2001);
- Developing creative pricing ideas for services (e.g., Biyalo-gorsky and Gerstner 2004);
- Building network externalities for services (e.g., Basu, Mazumdar, and Raj 2003);
- Measuring the impact of more service on customer welfare (e.g., Liu, Putler, and Weinberg 2004).

In summary, those in the first camp applaud S-D Logic. They find it is coherent with marketing history, and exchange as the essence of marketing. Even so, they find there is much practical work to be done; researchers are “far from capitalizing on the possibilities” (Day, 2006b). Yet without a clear model of the antecedents, processes and outcomes of S-D Logic, firms will be slow to adapt to the strategic prescriptions of S-D Logic. Firms burdened by inertia

from previous product-centric decisions must engage in the process of unlearning (Bettis and Prahalad, 1995). Without clear explication most firms and researchers are unlikely to embrace and extend what is argued by Vargo and Lusch (Day, 2006b, p. 88). As such, many are skeptical of the potential of S-D Logic.

### 2.3.2 The Second Camp: Interested but Unconvinced

S-D Logic has generated extensive dialogue, controversy, and debate. In this debate a number of researchers await evidence of the validity of S-D Logic (Ambler, 2006; Hunt, 2004; Woodruff and Flint, 2006). Hopeful, but pragmatic, these scholars acknowledge that the outcome of the S-D Logic debate, and the “shape of the new paradigm, [is] anything but certain” (Webster, 2006, p. xiii). Hunt (2004) finds that S-D Logic is coherent with resource advantage theory. Day (2004) finds S-D Logic explains structural changes in the market. Levy (2006) wonders if S-D Logic will spur practitioners and academic towards the centrality of customer. Deighton and Narayandas (2004) wonder if S-D Logic is a familiar set of contingencies or new framework from which to explain current marketing phenomena.

Hunt (2004) finds that S-D Logic is coherent with resource advantage theory. Specifically, Hunt (2004, p. 22) states that “V&L’s (Vargo& Lusch) argument is historically informed, finely crafted, properly interdisciplinary, and logically sound”. Hunt is particularly mindful of the distinction with respect to resources as both tangible and intangible. Yet, Hunt (2004) questions how S-D Logic values operant resources. While supportive of Vargo and Lusch’s (2004a) contention that marketing strategy should be taught from a resource advantage perspective, Hunt (2004, p. 22) states that “missing are the arguments for the why

and the how". As such, Hunt (2004, p. 22) extols researchers to give S-D Logic a "careful read and thoughtful evaluation, not a quick skim and hasty judgment".

Day (2004) finds that S-D Logic is properly poised as a new framework. Day (2004) believes that S-D Logic coherently explains the structural changes in the market that act as "tributaries" feeding a new dominant logic. These changes, or S-D Logic antecedents, are "services marketing, market orientation, customer relationship management, networked markets, mass customization, and interactivity" (Day, 2004, p. 18). The common denominator in this convergence is information technology the foundation of S-D Logic's knowledge-orientation is therefore well poised to provide an explanatory framework for knowledge-based competitive processes (Day, 2004). However, Day (2004) is concerned that firms will resist the shift to S-D Logic, suggesting that firms resting on what they know will have difficulty breaking the path dependency of the product paradigm. As such both goods and service frameworks will coexist for some time. Consequently, the boundaries, limits, and extensions of a new framework remain unclear.

From Levy's (2006) perspective those practitioners and scholars of a "service-centered frame of mind will feel reinforced, maybe enthusiastic, as is Rust (2004), or annoyed because they always thought that anyway" (Levy, 2006, p. 62). Although interested, Levy (2006) insists that for S-D Logic to be a new framework it will require support from both managers and scholars, and such support will take time. Levy (2006) questions when, and if, marketing as a discipline (both academic and practical) will recognize the centrality of customer as posited by Vargo and Lusch (2004a).

Deighton and Narayandas (2004) summarize the S-D Logic arguments succinctly. For them, S-D Logic does appear to explain marketing phenomenon of the last decade. They question whether this is a new dominant logic or a “familiar set of contingencies” (Deighton and Narayandas, 2004, p. 19). They assert the “answer lies in the inductive development of theory from phenomena closely observed and thickly described” (Deighton and Narayandas, 2004, p. 19).

### 2.3.3 The Third Camp: Those Dismissive of S-D Logic

In contrast other strategy scholars are dismissive of S-D Logic, finding little groundbreaking insight, and less promise in S-D Logic. These authors argue that S-D Logic, and its firm-centricity, fails to live up to a “new” dominant logic (Prahalad and Ramaswamy, 2004a). Others find the logic too abstract (Shugan, 2004), or that S-D Logic simply employs “services as another word for value-added” (Prahalad and Ramaswamy, 2004a). Some argue that there is no real “reorientation” implied by S-D Logic (Levy, 2006).

Some critique S-D Logic as limited by a firm-centric nature (Prahalad and Ramaswamy, 2004a; Prahalad and Ramaswamy, 2000; Prahalad and Ramaswamy, 2003). They argue that when a true “new” dominant logic embraces an experience-centric view, “new and exciting opportunities unfold” (Prahalad, 2004b, p. 23). This group argues that an experience-centric model is required to make comprehensible key intangible marketing constructs such as brand, customer orientation, and innovation (Prahalad, 2004b). They assert that Vargo and Lusch (2004a) do not provide an adequate interpretation of these variables with the S-D Logic conceptualization.

Experience-centric scholars look for an explanation as to why consumers facing an increased choice of products and services still appear dissatisfied (Prahalad and Ramaswamy, 2004a). They propose that an explanation of this paradoxical dissatisfaction requires a dominant logic that replaces the firm centrality of both product and service logic with experience-centric logic (Prahalad and Ramaswamy, 2004a). The goods/service-centric logic maintains, in a limiting fashion, distinct roles of production and consumption. What is required is a dominant logic explaining “interactions between consumers, consumer communities, and firms” (Prahalad and Ramaswamy, 2004a, p. 5).

Experience-centric scholar authors stress that understanding the co-creation experience is key to unlocking “new sources of competitive advantage” (Prahalad and Ramaswamy, 2004a, p. 7). This essence of the co-creation process is to “seek to co-create value with customers through an obsessive focus on personalized interactions between the consumer and the company” (Prahalad and Ramaswamy, 2004a, p. 7). Table 5 displays and contrasts what co-creation is and what co-creation is not.

Table 5  
The Concept of Co-Creation (Prahalad and Ramaswamy, 2004a, p. 8)

What co-creation IS NOT	What co-creation IS
Customer focus Customer is king or customer is always right	Co-creation is about Joint creation of value by the company and the customer. It is not about trying to please the customer
Delivering good customer service or pampering the customer with lavish customer service	Allowing the customer to co-construct the service experience to suit her context
Mass customization of offerings that suit the industry's supply chain	Joint Problem definition and problem solving
Transfer of activities from the firm to the customer as in self-service Customer as product manager or co-designing products and services	Creating an experience environment in which consumers can have active dialogue and co-construct personalized experiences; product may be the same (e.g., Lego Mindstorms) but customers can construct different experiences
Product variety	Experience variety
Segment of one	Experience of one
Meticulous Market Research	Experiencing the business as consumer do in real time Continuous dialogue
Staging experiences	Co-creating personalized experiences
Demand-side Innovation for new products and services	Innovating experience environment for new co-creation experiences

The co-creation experience focuses on dialogue, access, risk benefits, and transparency (Prahalad and Ramaswamy, 2004a, p. 9). This logic looks to transform the idea of relationship between firm and consumer to one in which the market is a “forum for co-creation experiences” (Prahalad and Ramaswamy, 2004a, p. 11). The experience-centric view argues the firm-centric perspective of S-D Logic to be limited, unable to encompass a “new” logic with

dominance in experience. Prahalad and Ramaswamy (2004a) discuss provide their interpretation of the shift in relationship between the firm and consumer in Table 6. Prahalad (2004b) argues that co-creation “revolve [s] around the individual consumer, the experience, the cocreation of value, the criticality of consumer communities, and the need for a network of firms” (Prahalad, 2004b, p. 23). The experience-centric view holds real challenge for deeply held marketing constructs (Prahalad, 2004b).

Table 6  
Transformation of the Relationship Between Firms and Consumers  
(Prahalad and Ramaswamy, 2004a)

From:	To: (Experience-Centric)
One way	two-way
firm to consumer	consumer to firm
consumers are prey	consumers can hunt
Choice = buy/not buy	consumer wants to can impose to is being
firm segments and targets consumers; consumers must fit into firms offering	consumers wants to/is being empowered to co-construct a personalized experience around herself, with firm’s experience environment

Other authors suggest that S-D Logic offers little new insight. Deighton and Narayandas (2004) wonder if S-D Logic is simply a more effective articulation than a new framework. Hunt (2004) looks for the how and why, his concern is that S-D Logic does not provide any new theoretical insights from which to solve marketing fragmentation issues. Hunt (2004) wonders if S-D Logic might be considered a rework of Boyd and Levy’s “New Dimensions in Consumer Analysis.” Shugan (2004) is hesitant, suggesting that S-D Logic as currently articulated, is too abstract.

This controversy highlights the conceptual nature of S-D Logic (Webster, 2006) and limited empirical support for its boundaries, limitations, and extensions (Deighton and

Narayandas, 2004). There is no clear model explicating the processes, antecedents, and outcomes of an inductively generated theory suggestive of the structure of S-D Logic. Further, the actionable link between S-D Logic as a foundation for a general theory of marketing, and initial model of such theory remains elusive. As such, S-D Logic provides a rich research area where there is much theoretical and practical work to be done (Day, 2006b). From the firm perspective, S-D Logic requires a clear model of its antecedents, processes and outcomes. Failing this, firms will be slow to adapt to the strategic prescriptions of S-D Logic. Firms, burdened by inertia from previous product-centric decisions, will find it difficult to unlearn those lessons (Bettis and Prahalad, 1995). Without clear explication, most firms, and most researchers, are unlikely to embrace and extend what is argued by Vargo and Lusch (Day, 2006b, p. 88).

#### 2.4 Background of Performance Based Logistics

Support of empirical investigation of S-D Logic requires a sample that exhibits similarity in structure. Those supportive of S-D Logic argue that S-D Logic explains structural changes occurring in the market place (Day, 2004). A grounded theory investigation of S-D Logic therefore requires a sample whose strategy and organization is specifically designed to address similar structural changes. As S-D Logic continues to generate attention, and extensive literature support, so too does a new performance-oriented sustainment strategy within the Department of Defense (DoD). This new strategy is called performance based logistics (PBL). An initial review of the PBL literature indicates that PBL and S-D Logic have much in common. As such, PBL provides an excellent sample in which to inductively critique S-D Logic.



Like S-D Logic PBL adopts knowledge as the core to competitive advantage, and puts customer perception of performance central to the exchange relationship (Wynne, 2004). PBL is the DoD's preferred approach for weapon system sustainment (Wynne, 2003). PBL relies on performance-oriented strategy as part of the DoD's comprehensive systems engineering process; the goal of which is to help logistics managers "optimize performance and cost objective through strategic implementation of varying degrees of Government-Industry Partnerships" (Krieg, 2006, p. 5.3). DoD regulation 5000.1 provides general overview of the key tenets of PBL;

The essence of PBL is buying performance outcomes. It is procurement of a capability to support the warfighter versus the individual parts or repair actions. This is accomplished through a business relationship that is structured to meet the warfighter's requirements. PBL support strategies integrate responsibility for system support in the Product Support Integrator, who manages all sources of support. Source of support decisions for PBL do not favor either organic or commercial providers. Like traditional support strategies, PBL optimizes the best public and private sector competencies based upon a best-value determination, evidenced through an appropriate analysis of the provider's product support capability to meet set performance objectives. The major shift from the traditional approach to product support emphasizes how program manager teams buy support, not who they buy from. Instead of buying set levels or varying quantities of spares, repairs, tools, and data, the focus is on buying a predetermined level of availability to meet the warfighter's objectives (Krieg, 2006, p. 5.3).

In summary PBL is 1.) A firm strategy focused on purchasing performance instead of product-centric repair actions, 2.) Is based upon relational exchange as opposed to transactions, 3.) Focused on meeting unique customer (co-creation) performance requirements, 4.) Provides specific guidelines for contractual actions in support of performance attainment, 5.) Identifies a shift from buying tangibles goods to buying intangible outcomes. Embedded in DoD PBL guidance is an articulation of operant and operand resources. The DoD's

core capability is warfighting. PBL, as supportive strategy, allows DoD to focus on the core business of war-fighting while gaining partners to co-create performance. As such, PBL enables DoD to co-create through sustainment partners, the required level of support to meet warfighting objectives (DoD Directive 5000.1, 2005).

PBL has practical applications with significant interest from major aerospace firms (US and European) as well as US and NATO allied governments (Cothran, 2006). PBL, as the preferred DoD sustainment approach, currently represents billions of dollar worth of supply chain management per year. These broad groupings of PBL strategies offering many opportunities for research, education, executive education, and policy (Pagonis, 2004). PBL as a firm strategy integrates supply chain strategy and the marketing management strategies of the supplier and focal firm with customer performance requirements. This is a growth area; multi-government / industry teams (such as F-35 Joint Strike Fighter) are increasing their cooperative weapons system development and sustainment strategies (Nativi and Barrie, 2006) .

However, recent General Accounting Organizations reports indicate that the DoD struggles to develop policy, regulation, organization, structure, training, and metrics in support of PBL (General Accounting Office, 2004a; General Accounting Office, 2005; General Accounting Office, 2004b). There is no clear theoretical model explicating the process by which PBL achieves advantage. The overarching strategy for PBL and its link to firm and inter-firm strategy remains elusive. As a practical and implementation tool, PBL guidance does not provide conceptual terms of PBL congruent with the language of science. Inductive investigation of those organizations implementing PBL promises to reveal the underlying theoretical structure

of PBL. At the same time many of the tenets, environmental influences, and philosophies of PBL, while linguistically different, appear conceptually similar to those of S-D Logic.

## CHAPTER 3

### METHODOLOGY

This investigation uses grounded theory to reveal the theoretical structure of organizations shifting from product to performance-oriented strategy. This approach acts on a theoretical curiosity about the statement “S-D Logic as the foundation for a general theory” (Lusch and Vargo, 2006b, p. 406). This grounded theory investigation uses S-D Logic as an initial theoretic lens (Charmaz, 2006). The research uses inductive technique to generate theory from a performance-oriented sample that is highly characteristic of S-D Logic conceptualization. The result reveals boundaries, limitations, and extensions of S-D Logic, informs an assessment of the fundamental premises and the S-D Logic debate, and suggests a theoretic structure of S-D Logic. This section describes the methodology employed in this investigation. First, the specific methodology of the grounded theory approach is presented. This is followed by the mechanics involved with this investigation.

Grounded theory defines the salient variables and theoretically arranges them through the analytic process of constant comparison (Charmaz, 2006; Glaser and Strauss, 1967a). This approach is well suited for the study of complex inter-organizational business relationships {Bettis, 1995 #1502}. Investigations into complex adaptive systems require an ability to recognize and articulate nonlinear interactions (Holland, 1992). Grounded theory provides rigorous non-linear approaches that not only have rational place in such studies, but optimistic opportunities for success (Charmaz, 2006).

For those pragmatists awaiting demonstration of the authority of S-D Logic this investigation provides the first round of observational, empirical data. If, as some contend, S-D

Logic is limited by firm-centrality of its suppositions, or merely a restatement of the old, this illumination should give form to such contrarian comments. If S-D Logic provides a foundation for a general theory of marketing than this investigation, into an s-d like environment should elucidate the key process, antecedents, and outcomes supportive of such S-D Logic oriented theory of exchange.

In summary, this research approach, based upon grounded theory method, provides an emerged theory from a service oriented industry (performance logistic). The emerged theory offers insight into the underlying structure of an industry shifting from a product to service focus. The emerged theory of PBL provides a platform to inform an evaluation of the premises of S-D Logic and posit a theoretic structure of S-D Logic.

### 3.1 Rationale for Grounded Theory

The research problem dictates the solution (Eisenhardt, 1989; Glaser and Strauss, 1967b; Kerlinger and Lee, 2000). This investigation aims to generate a theoretic model of on underlying substantive area suggested by S-D Logic. Inductively generated grounded theory is the appropriate method (Charmaz, 2006; Glaser and Strauss, 1967a). Properly executed investigations aimed at revealing the underlying nature of a substantive area through inductive theory generation have resulted in seminal knowledge generation in business research. Previous inductive theory investigations led to entire research streams, such as service quality (Parasuraman et al., 1985), market orientation (Kohli and Jaworski, 1990), and market strategy implementation (Noble and Mokwa, 1999). The search for underlying structure revealed through inductively generated theory results in a positive model the “what is” (Hunt, 2002). The strength of such model is in the ability to inform normative assertions, “what should be” (Hunt,

2002). Such models are instructive for both research and practitioner. Further, the inductively generated model provides a rich foundation for follow-on deductive, quantitative, investigation supportive of greater generalizability (Charmaz, 2006; Hair et al., 1998).

Grounded theory methodology is appropriate for the logic of discovery (Glaser and Strauss, 1967b; Swartz, 2005). S-D Logic is proposed as a conceptual framework, its constructs and their relationships are as of yet undeveloped (Webster, 2006). This stage of research calls for methodology supportive of “inductive development of theory from phenomena closely observed and thickly described” (Deighton and Narayandas, 2004, p. 19). Grounded theory provides such a method.

Is there a new dominant logic for marketing or just a familiar set of contingencies? We do not know the answer...However, we do assert that the answer lies in inductive development of theory from phenomena closely observed and thickly described. Writing of early history of thermodynamics, Lord Kelvin said that the steam engine had given more to science than science had to the steam engine. In the same spirit, we suggest that at this point in marketing’s evolution, perhaps the marketplace has more to teach scholars than scholars have to teach the marketplace (Deighton and Narayandas, 2004, p. 20)

Figure 1 shows how this work falls in an area requiring inductive logic in order to build theory (Burrell and Morgan, 1979; Swartz, 2005). The use of grounded theory moves beyond case description and toward development of theoretic categories and posited relations between these categories (Charmaz, 2006). Lusch and Vargo (2006b) propose S-D Logic as a foundation for a general theory, one waiting to have its conceptual variables and their theoretic relationships uncovered. S-D Logic, its premises, and debate, provide a rich substantive area for investigation. PBL, an environment flush with S-D Logic like phenomena, provides a rich sample from which to generate a grounded theory and inform the debate.

Figure 1

The Research Evolutionary Model adapted from Swartz (2005)

Objective/Phase	Paradigm	Logic/Theory	Hypotheses	Data	Method	Causality
OBSERVATION "Facts"	Qualitative	Inductive	"Presence of A"	Field or Natural	Pre-Experiments Ethnography Phenomenology Case Study	Construct Validity - Convergent
CATEGORIZATION "Characteristics"	"Descriptive"	T Building	"Presence of A distinct from B"	Setting	Content Analysis <b>Grounded Theory</b> Historical	- Divergent Rationality - A priori - Falsifiability
CORRELATION "Associations"	Quantitative	Deductive	"Covariance between amount of A and amount of B"	Lab or Designed Experiment	Observational Developmental Correlational Surveys	- Parsimony Correlation - Statistical sig - Practical sig
CAUSALITY "Relationships"	"Prescriptive"	T Validating	"A causes B"		Designed Experiments - True - Quasi	Temporal Precedence Exclusivity

Grounded theory provides the appropriate analytical method to look within an organization and illuminate the fundamental antecedents, processes, and outcomes that form the inherent structure in human activity. Grounded theory efficiency is related to the richness of the observable phenomena in the substantive area (Charmaz, 2006). PBL provides that rich substantive area. The grounded theory approach, as shown in Figure one, emerges theoretic structures from complex adaptive systems.

### 3.2 Logic of Discovery in Complex Adaptive Systems

Complex systems "seek to adapt to their environments" (Bettis and Prahalad, 1995, p. 11). S-D Logic suggests a knowledge based evolution in the market competition.(Vargo and Lusch, 2004a) This evolution therefore should be reflected in the underlying structure of the adaptive organizational systems. Study of the adaptive and evolving (dynamic) environment inferred by S-D Logic then requires an initial methodology which maintains cognitive awareness of the complexity of the system while isolating its salient variables:

Reductionism is not a viable approach to studying complex systems. Knowledge of the constituent is not knowledge of the whole or major parts (Bettis and Prahalad, 1995, p. 11).

In such situations the usual technique of linear approximation and statistical generality are of limited value (Holland, 1992).

Inductive theory generation rests upon theories of complex adaptive systems (Holland, 1992). Study of complex adaptive systems requires comprehension of aggregate behavior in order to understand the structure or rules upon which the system adapts (Holland, 1992). The market represents a complex adaptive organizational system. As organizations adapt they reveal the environmental forces shaping that adaptation (Holland, 1992). The nonlinear interactions displayed by organic adaptive systems become more comprehensible when contemplated from a basis in chaos theory (Gleick, 1987; Stewart, 1989; Wilding, 1998). Grounded theory supports such aggregate level, inductive, and pattern searching investigation (Charmaz, 2006; Glaser, 1992; Glaser and Strauss, 1967b; Holland, 1992).

The entities studied in this investigation represent complex adaptive systems. The sample represents numerous organizations undergoing a transition from a product to a performance strategy. These organizations are at varying stages of the product to performance shift. This environment is similar to the market progression from goods to service dominant logic captured by S-D Logic (Vargo and Lusch, 2004a). Grounded theory method is particularly effective in revealing underlying structure as organizations undergo an environmentally driven evolution (Charmaz, 2006). However the interrelated nature of macro-organizational system evolution makes comprehension of the whole through study of the piece exceedingly difficult (Holland, 1992). Comprehension of an organic macro system requires study of whole:



All complex adaptive systems involve large number of parts undergoing a kaleidoscopic array of simultaneous nonlinear interactions. Because of the nonlinear interactions, the behavior of the whole system is not even to an approximation, a simple sum of the behavior of its parts. The unusual mathematical techniques of linear approximation—linear regression, normal coordinates.... and the like—make little progress in the analysis of complex adaptive systems.... Complex adaptive systems anticipate. In seeking to adapt to changing circumstances the part develop 'rules' (model) that anticipate the consequences of responses... the effect of local anticipations on aggregate behavior is one of the aspects of complex adaptive systems we least understand (Holland, 1992, pp. 184-85)

Substantive contextual changes (such as product to service) calls into question wholesale transference of variables conceptualized in the previous framework into the new framework (Kuhn, 1996). Grounded theory addresses these concerns. Grounded theory the previous variables are reconceptualized as efficiently represent discrete encapsulation of knowledge (Glaser and Strauss, 1967b; Hunt, 1992), without imbuing bias of previous theoretic structure(Charmaz, 2006). The new theoretic structure and its variables illuminated by the nascent grounded theory informs a retrospective evaluation of the previous frameworks variables and theoretic structure (Burrell and Morgan, 1979; Charmaz, 2006; Hunt, 1990). Thus grounded theory retains the summative accumulation of knowledge while breaking free of structural path dependencies of the previous paradigm.

Support for inductive qualitative technique in business research is on the rise (Day and Montgomery, 1999; Deighton and Narayandas, 2004; Hunt, 1992; Kavanagh, 1994; MacInnis, 2005; Morgan and Hunt, 1994). Qualitative research programs provide an ability to focus on the aggregate level system, as opposed to decomposed parts (Webster, 2006). Qualitative investigation, such as grounded theory, gives business research a holistic explanation of current marketing variables along with identification of new marketing variables through rich

observation and analysis (Deighton and Narayandas, 2004). This approach addresses practitioner concern that current marketing variables are increasingly studied out of context and almost unrecognizable (Brown, 2005). Senior executives have called for study results that are inherently more comprehensible and actionable (Brown, 2005; Day and Montgomery, 1999; Webster, 2005). This grounded theory investigation provides such results.

Varki, et al (2000, p. 486) asserts that “in marketing, qualitative data are used in theory development for investigating marketing phenomena in more depth.” Varki, et al (2000) found that between 1988 and 1997, there were 100 articles in the *Journal of Marketing*, *Journal of Marketing Research*, and *Journal of Consumer Research* using a qualitative approach. Grounded theory in marketing research has evolved key marketing constructs in the last two decades (Kohli and Jaworski, 1990; Narayandas and Rangan, 2004; Noble and Mokwa, 1999; Parasuraman et al., 1985). This research follows a similar path. S-D Logic, investigated in a PBL environment, provides identification, definition, and description of core constructs, defined through highly complex, nonlinear systems. S-D Logic and PBL provide the potential for rich, new, “big”, marketing variables; variables with significant practical interest (Staelin, 2005). As this research endeavors to develop theory, grounded theory is the appropriate methodology to accomplish that task.

### 3.3 Analytic Process: Method of Constant Comparison

Grounded theory relies on the logic of constant comparison (Charmaz, 2006; Glaser and Strauss, 1967b). Constant comparison asserts that there is an underlying structure in complex adaptive systems. Interview, re-interview, and new interview brings into focus emerging

variables and theoretic relationships. The result of this process is an inductively derived theory logically configured to support follow-on empirical deductive investigation.

Grounded theory was originally conceptualized and employed to study the process of dying (Glaser and Strauss, 1967a). Since that time numerous disciplines have generated successful grounded theory. Within business research grounded theory, or similar methods of theory generation, have successfully generated a number of key business process variables (Kohli and Jaworski, 1990; Noble and Mokwa, 1999; Parasuraman et al., 1985).

This investigation uses the grounded theory approach as conceptualized by Glaser (1992; 1998) and as instructed by Charmaz (2006). The approach relies on rigorous constant comparison to inductively generate theory. In accordance with Glaser (1992, p. 11) the qualitative researcher's is to "absorb the data as data, to be able to step back or distance oneself from it, and then to abstractly conceptualize the data." This process consists of three major components, (1) data collection, (2) the analysis, "that soon generate the concepts, hypotheses and their integration which result in the production of (3) written and verbal presentations" (Glaser, 1992, p. 13).

This grounded theory investigation makes use of recorded interview, transcription, and coding for theoretic relationships (Charmaz, 2006). The interviews schedule (40+interviews) is consistent with previous marketing research involving grounded theory (Homburg and Pflesser, 2000; Noble and Mokwa, 1999; Parasuraman et al., 1985). Table 7 provides the concepts and definitions used in this investigation.

Table 7  
Grounded Theory Words and Concepts Adapted from Charmaz (2006, pp. 187-89)

Axial coding	The type of coding that treats a category as an axis. This process keeps the category grounded in the emergent theoretical structure. Axial coding provides for a theoretic thread which links the emerging category through the emerging model. This process is used in the technique of Corbin and Strauss. From the perspective of Glaser (1978) and Charmaz (2006), the idea of axial coding is accomplished through the inter relationship of codes, and sub codes beneath a category though use of theoretic coding
Categorizing	The abstract evolution of certain codes with overriding significance
Coding	The process of defining what data are about with bias of previous conceptualization
Constant comparative model	Analytic method that generates successively more abstract and theoretically related categories
Focused code	Using the most significant and/or frequent codes to sift through large amounts of data, and make decisions about which initial code makes the most analytic sense in support of emerging categories.
Theoretic coding	Introduced by Glaser (1978) conceptualizes how the focused codes may relate to each other as hypotheses of an integrated theory
Grounded theory	Method of conducting qualitative research that focuses on creating conceptual frameworks or theories though inductive analysis from data.
Substantive Theory	Theoretical interpretation and depiction of the underlying theoretical structure of a particular area
Theoretical sampling	Deliberate collection of empirical data to inform and fill out theoretic categories, not for generalization of the model
Theoretical saturation	The point where gathering more data about a theoretic category reveal no new properties about a category or any further theoretic insights

Grounded theory as developed by Glaser and Strauss (1967b) is based upon a the method of comparative analysis. This method derives theory from observational data in a highly systematic manner. Grounded theory adheres to scientific, positivists tenets that seek “predictions, explanations, interpretations, and applications” (Glaser and Strauss, 1967b, p. 1). Grounded theory relies on empirical (field) observation to emerge concepts and categories. As

such grounded theory is a rich source of emergent, and contextually relevant, variables (Charmaz, 2006). Figure 2 outlines the structure and application of the grounded theory method.

Figure 2  
Grounded Theory Process Adapted from Charmaz (2006)

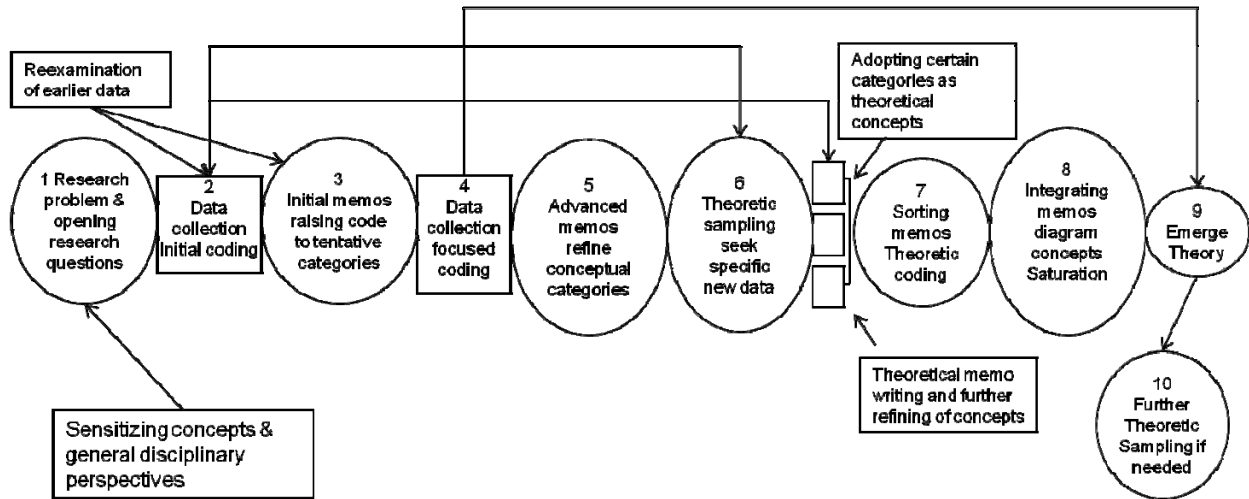


Figure 2 (Charmaz, 2006, p. 11) provides an overall example of the process of grounded theory adopted in this investigation. The process (step 1) begins by addressing the nature of the research question and consideration of grounded theory as the appropriate method. As discussed previously, literature and discipline specific perspectives (in this case S-D Logic), are used to frame the initial approach to the grounded theory investigation. As the investigation proceeds, departures from S-D Logic concepts are rigorously pursued as appropriate. In grounded theory the “data speak for themselves” (Strauss and Corbin, 1998). The nature of the substantive area under study instructs the investigation, not the initial literature and archival data.

At step two the sample is identified and initial data collection begins. The sample was selected for its potential as a rich with respect to the substantive area under study (Charmaz, 2006; Glaser and Strauss, 1967b; Strauss and Corbin, 1998). The sample, PBL, demonstrates rich potential to represent the substantive area of S-D Logic. Organizations are chosen that are in various stages of PBL strategy (acquisition, modification, and sustainment). Sampling of structurally different organizations in similar substantive area allows for greater dimensional development of emerged concepts, categories, and theoretical relationships (Charmaz, 2006; Glaser and Strauss, 1967b; Strauss and Corbin, 1998).

The core process of grounded theory is the method of constant comparison (Glaser and Strauss, 1967b). Comparative analysis emphasizes “discovery of what concepts and hypotheses are relevant for the area that one wishes to research” (Glaser and Strauss, 1967b, p. 2). In grounded theory, data (blocks 2 and 4) are coded into conceptual themes. These conceptual codes are emerged from the interview and fill out the conceptual categories (constructs).

Steps 3 and 5 outline the use of memo’s in the grounded theory process. The memo forms the researcher’s notes as ideas emerge while the researcher is immersed in the empirical data (Charmaz, 2006). Memos provide rigor, transparency, and reliability from which committee members, and follow-on researchers, can judge the validity of the investigators emerged variables and theoretic relationships.

Theoretical sampling (step 6) provides validation in grounded theory (Charmaz, 2006; Glaser, 1992). Theoretical sampling is an iterative process (Charmaz, 2006). Theoretical sampling involves selecting follow-on samples to fully explicate a proposed conceptual category by “filling out” the category (Strauss and Corbin, 1998). The process of theoretical sampling

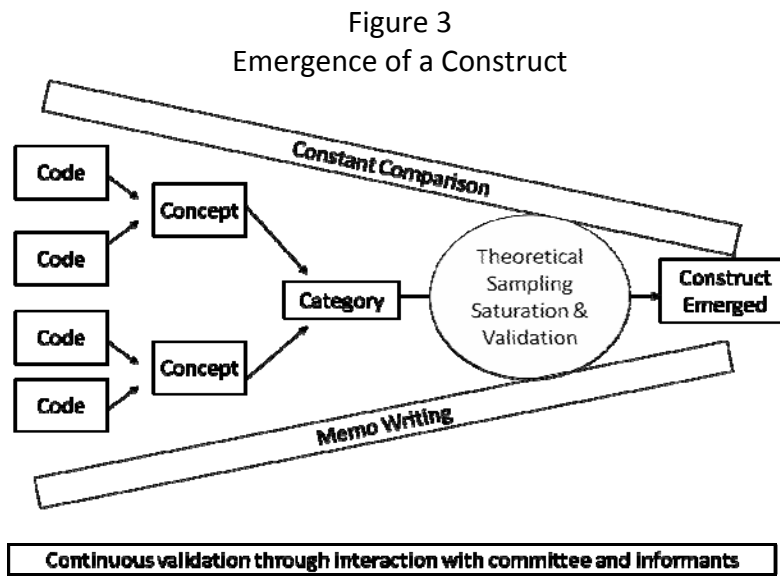
involves sequential comparisons. Sequential comparison involves comparing data in earlier and later interviews to find similarities and differences (Charmaz, 2006; Glaser and Strauss, 1967b; Strauss and Corbin, 1998). It is through this constant comparison, in concert with investigative team and committee member oversight, that the researcher guards against possible distortions of meaning (Charmaz, 2006; Strauss and Corbin, 1998).

In this investigation the ability to theoretically sample different organizations engaged in performance-centric PBL strategies, (such as those in an acquisition phase, or sustainment phase) provide contrasting venue to fill out the dimensionality of the categories. Sampling based upon the level of the supply chain (focal firm, first tier supplier, and customer) enhances the validation and dimensionality of this research. Sampling based upon level of responsibility (VP, manager, and production line) also contributes to this dimensionality.

In steps 7 & 8 the grounded theory emerges salient variables and identified relationships between conceptual categories. The final analytical step (9) in the grounded theory methodology involves integrating the memos into diagrams. The sorting and integrating of memos results in the development of theoretic relationship between categories (Charmaz, 2006).

Sorting and theoretical sampling continues until theoretical saturation. Theoretical saturation occurs when no new properties of the categories emerge during data collection (Charmaz, 2006). Properly accomplished rigorous grounded theory emerges constructs and theoretic relationships. In using grounded theory method “perceptiveness and insight are required to sense the structural changes and understand their importance, but it is the structural changes that provide the underlying basis for new paradigms” (Bolton et al.,

2004, p. 24). Figure 3 provides a notional diagram on how codes, converge to become categories and the theory emerges.



As shown in Figure 3, constructs begin as code emerged from the primary data. These initial codes are funneled through constant comparison and memo writing in an analytic process that transforms codes into concepts, and concepts into categories. Through the alchemy of theoretical sampling, saturation, and validation, codes finally emerge as constructs (Charmaz, 2006). These constructs, inductively derived, are then related spatially in a grounded theory (step 9). Such inductively derived grounded theory is then supportive of follow on quantitative methodology employing deductive method. This emerged theory is presented in graphical form representing antecedents, core processes, and outcomes.

### 3.4 Grounded Theory Tools and Techniques Employed

Each grounded theory adopts a study specific methodology. This section provides a description of the tools and techniques employed in this grounded theory. This section



describes the initial interview protocol and sampling framework. Next this section details transcription methodology. This section concludes with a discussion of the software selection process.

### 3.4.1 Interview Guide

The approach adopted for creation of the interview guide is based conceptually in Glaser (1992; 1978) and instructed by Charmaz (2006). The interview questions serve as a guide that allows the research to focus on the content of the current dialogue without worry about the next question. The researcher is cautioned against using the guide to ask a “series of ‘do you’ questions that cut off exploring the topic” (Charmaz, 2006, p. 30). The initial interview questions get the dialogue going and provide preplanned guideposts of the intended area of interest. However, the guide is not an end in itself, caution is required to guard against missing an unanticipated but illuminating exchange (Charmaz, 2006).

The goal in grounded theory is not an analysis of the preplanned questions but the exploration into the substantive area. The goal of the question is to get at the underlying structure involved with the substantive area while minimizing bias. This approach requires well thought out open ended questions (Charmaz, 2006). From a practical standpoint the more ubiquitous the phenomena under study, the more concerned the participant with the substantive area at hand, the more likely the interview will flow easily. The researcher task is to facilitate the subject quickly shifting in their own cadence telling their important stories (Charmaz, 2006) .

### 3.4.2 Interview Recording and Transcription

The interviews are recorded using a digital recorder, “coding full interview transcriptions gives you ideas and understanding that you otherwise miss” (Charmaz, 2006, p. 70). Coding full transcriptions provides depth to the investigation that might otherwise be lost using field notes alone (Charmaz, 2006). Transcribing and coding from a recorded conversation provides the researcher context and insight from the nuance and tone of the interviewed participant. Transcription by the field researcher, the one who also codes the data, ensures that this nuance is reflected in the analytical process.

The transcriptions are created using Dragon Speak Naturally. To accomplish the transcription, the researcher listens to the interviews, and then speaks into Dragon Speak to create the written transcription. Transcription by the researcher allows initial codes to be included in the text along with notes and memos. As transcriptions are coded within the software system, the recorded interview is used to verify and correct any errors in the transcription. The recorded interview is also referred to during the coding process to provide greater contextual awareness. Some interviews where facility procedures do not allow recordings. In these cases field notes document the interview.

### 3.4.3 Software

This investigation uses Computer Assisted Qualitative Data Analysis Software (CAQDAS) software to support the grounded theory development. The software package chosen is MAXQDA. CAQDAS software historically supports one of two qualitative data analysis approaches. The first approach is to use software for quantitative analysis of textual data. This type of work searches for patterns and structure through generation of word counts,

frequencies, etc. The second approach uses software to increase the administrative efficiency of a grounded theory analysis. This type of software emphasizes efficient coding of text, coding of relationships, use of code trees, memo writing, and analysis of code intersections. Most modern CAQDAS packages have integrative tools that support both approaches (Lewins and Silver, 2006).

Six CAQDAS programs were considered based upon research conducted by The CAQDAS Networking Project. Four of these software packages (MAXQDA, QDA Miner, and NVivo 7, and Atlas TI) were further evaluated by downloading and assessing a demonstration version of the software. Of these programs MAXQDA stood out as the most supportive of the current research effort. MAXQDA uses words and structure congruent with the methodology proposed by Glaser (1992; Glaser, 1998), Glaser and Strauss (1967b), and Charmaz (2006). Additionally MAXQDA provided efficient method to support mapping, and remapping (MAXMAPS) of the emerging grounded theory. MAXQDA also provides a full suite of quantitative tools (MAXDICTIO) useful in follow on research.

#### 3.4.4 Caution of Quantitative Techniques

A note of caution when applying quantitative techniques, such as word count, to grounded theory. These count based techniques are incongruent with the underlying logic and structure of grounded theory. The software programs provide a number of tools in support word count, frequencies, etc. These tool have little place in place grounded theory. Word count and frequency are misleading; the interviews are guided and open ended, not structured. Therefore there is no reliability or validity associated statistical generalities dealing with word count of the elicited response. The aim in grounded theory is to uncover salient variable and

relationship. Some of these relationships come quickly; they are easily defined and less controversial. These generated low word count. Some variables generated a great deal of discussion, and thus a great deal of word count. However word count is not an indicator of weight or importance of the construct and its relationship. Some variables like mindset, were key to the grounded theory, yet these emerged late, the practitioner recognized them retrospectively; any word count would miss constructs such as these.

## CHAPTER 4

### ANALYSIS

The analysis follows the conceptualization of Glaser & Strauss (1967b), and Glaser (1992; 1978), and the specific application and methodology of Charmaz (2006). Grounded theory relies on the methodology of constant comparison. This methodology involves a nonlinear analysis. The process outlined by Charmaz (2006) is used to depict this nonlinear analysis in a linear fashion. This chapter begins with a description of the analytical process of constant comparison employed. This section provides explication of coding, memo writing, sampling, saturation, and sorting. The second section presents the emergent theory. The performance-centric grounded theory is presented as a theoretical framework. The categories, their relationship, and propositions are presented. The third section uses the emerged grounded theory to inform an assessment of the S-D Logic premises and debate. In this section the grounded theory informs an assessment of the boundaries, limitations, and extensions of S-D Logic. The fourth section presents the constructs, relationships and proposition suggestive of a theoretic model of S-D Logic.

#### 4.1 Description of the Analytical Process

This section presents the analysis performed to generate the grounded theory. The grounded theory process is a nonlinear method. This method requires the reader to keep in mind the complex, iterative, and inter-related nature of the analysis with respect to the categories, sub-categories, and their relationship. For those not more intimately familiar with grounded theory, keeping Figure 3 close at hand may assist in that task. Additionally, readers unfamiliar with qualitative terms and concepts may find Table 7 helpful.

The analysis begins with a discussion of the interview and the sample. Then the next section presents the coding and memo writing process. Due to non-disclosure agreements and requirements of the institutional review board specific experts from interview are limited or redacted. The final section discusses the use of sorting and saturation.

#### 4.1.1 Interview

This research program used intensive interviews to gather data (Charmaz, 2006). The process was facilitated by use of an interview guide. The guide was developed based upon a review of the substantive area under consideration (to include the S-D Logic literature and PBL archival data). The interview guide also benefited from review by senior industry and academic experts. Table 8 provides the initial pedigree for the guide.

Table 8  
Pedigree of Initial Interview Guide Adopted from Kohli & Jaworski (1990)

Kohli and Jaworski Market Orientation Interview Questions	Adaptation to current study
What does the term “market/marketing orientation” mean to you?	What does the term “performance based logistics” mean to you?
What kind of things does a market /marketing-oriented company do?	What kind of things does a performance based logistics strategy require?
What organizational factors foster or discourage this orientation?	What organizational factor foster or discourage performance based logistics strategy?
What are the positive consequences of this orientation?	What are the positive consequences of a performance based logistics strategy?
What are the negative consequences of market orientation?	What are the negative consequences of performance based logistics?
Can you think of a business situation in which this orientation may not be very important?	Can you think of business situation in which a performance based logistics strategy may not be very important?

During two initial meetings with industry executives and two meetings with academic experts the guide was further adapted to the current study. Table 9 shows that adaptation. The guided was largely used at the end of the conversations to check for any missed ground.

Table 9  
Supplementary Interview Questions Based Upon Focused Discussion with Industry and Academic Professionals

What are the core processes of performance based logistics?
Why does performance based logistics work?
Who is the performance based logistics champion?
What does performance mean? How does it apply to each of the constituents? What are its properties? What are its dimensions?
What could you do to make your PBL better? Why don't you? What are the PBL metrics measures? What behaviors do they incentivize? Could they be better?
Why do you think DoD is pursuing PBL (What is the environment)
Are there stages (evolutionary processes) in PBL? What stage are you at? What was the previous stage? What is the next stage? Can we trace PBL as an event? (what is the underlying structure
What are PBL metrics?

The interest in the PBL topic area generated a number of practitioner-oriented questions. Table 10 outlines these questions. These questions demonstrate practitioner interest in understanding the structural phenomena associated with implementing a performance based strategy. The interview guide provided a “broad sweep of the landscape.” (Charmaz, 2006, p. 14). As the interviews began the guide was largely set aside. From the first interview there was widespread interest, experience, and opinion with respect to PBL.

Table 10  
Questions of Interest to Department of Defense

1. How different teams have implemented the PBL guidance--why have differences emerged and how have differences affected implementation?
2. What lessons can be learned from these different applications?
3. How the PBL effort compares between DoD and contractor implementation--is performance and practice aligned with the same objectives? If not, why not? What are the potential issues and how can they be overcome? What are the best practices used in both sectors?
4. What changes are recommended for organizing and implementing PBL efforts including DoD and USAF policy?
5. What contributes to the long-term success of a PBL effort--how can these initiatives be sustained over time?
6. What metrics incentivize behavior oriented toward knowledge sharing (customer and suppliers) aimed at making better decisions and improving processes to decrease cost and improve performance?
7. How can market based (competitive environment) business theories be adopted and adapted by DoD sustainment?
8. How does funding level increase / decrease performance under PBL?

Charmaz (2006, p. 29) states the grounded theory method should generate results within the initial interview. That was the experience with this research. The interview guide got the interview started, ensured key areas were covered, and guarded against limiting the scope of what the research participants wished to discuss. The overall approach resulted in an intensive interview structure that explored without interrogating (Charmaz, 2006, p. 29). An effective interview technique to generate this type of insight began with a question about the most recent success story in PBL, and then followed up with a question as to why that did not occur earlier.

The investigation led to 44 recorded interviews. Four of these recorded interviews were re-interviews. As such there were 40 recorded interview participants. In addition another 8 industry participants were not recorded, however notes were generated during these



interviews. Table 11 provides the general background of the interview participants. The detail provided by Table 11 is limited to protect the identity of the participants. Some of those interviewed are well known and would be recognizable based upon their background. Research participants experienced PBL across a number of weapons systems with differing stages of PBL evolution; indeed one code generated during the analytic phase was “stages of PBL.” Some research participants experienced PBL in both system and subsystem PBL strategy. A total of 24 of the 44 recorded interviews were transcribed and coded. The other 20 recordings were reviewed, with notes taken, to support theoretical saturation.

Table 11  
Interviewee Background

Experience	3 to 40 years
Functional area	Engineering, supply chain management, logistics, operations, finance, contracting, international business, business strategy, acquisitions, government, depot supervisor, military logistics (USAF and Army), technician, special operations officer, special programs
Level	Executive vice president to line technician
Supply chain tier	Customer, prime contractor, and tier 1&2 supplier
PBL Stage	Full PBL to non-PBL

A number of the participants had deep experience on multiple systems, with both government and industry. In the course of the interview these research participants would use contrasting examples based upon their background to illuminate an idea or make a point. The resultant interviews gave great depth through their ability to compare and contrast the mindsets, processes, and outcome associated with a conversion to PBL. These research participants represented what Kuhn (1996) described as those of the old paradigm who successfully made the transition to the new.

Overall the research participants recognized PBL as a substantive area representing a fundamental shift from delivering product to providing objective, and measurable, performance. The research participants presented a broad range of opinion on PBL. Some were supportive of PBL, others dismissed PBL as “just another buzz word”, still others were skeptical of PBL’s promise. Even those new to the industry, with limited experience on PBL, were interested in sharing their views and concerns. The interviews confirmed Charmaz’s (2006, p. 29) assertion that in many cases the first question will nearly suffice “for the whole interview” as “stories tumble out.” Most of the interviews began with “what are your thoughts about PBL?” and ran to an hour, the interview guide untouched.

Time passed quickly during the interviews. A 45-minute session seemed to flow along effortlessly. Occasionally, at the 70-minute point, the next scheduled participant waiting, the interview was curtailed. In these cases a follow-up interview was conducted either in person or by phone.

As questions arose during transcription and coding, the research participants were always willing to provide follow on support in order to clarify variables, ideas, and theoretic relationships. Notes (or recordings) from these conversations, provided supplemental insight which illuminated the emerging grounded theory. The use of intensive interview met the requirement for “an in-depth exploration of a particular topic with a person who has had the relevant experiences” (Charmaz, 2006, p. 25).

#### 4.1.2 Coding and Memo Writing

The analytic process of grounded theory begins with coding (Charmaz, 2006). Initial coding takes a great deal of time; each statement examined to provide an “understanding of

studied life but also help direct subsequent data-gathering towards the analytic issues being defined” (Charmaz, 2006, p. 42). The coding process provided efficient summarization and categorization of segments of data. Each code represented a piece of the underlying structure. Each paragraph (or paragraphs) tied together that structure. The ability to tie these relationships together required a focused mindset capable of finding pattern within the data (Glaser, 1992). Table 12 provides questions which help set the analytic mindset to coding and analysis (Charmaz, 2006, p. 24).

Table 12  
A selection of Mitchells Questions as Cited in Charmaz (2006, p. 24).

What is going on? What is the overall activity being studied, the relatively long term behavior about which participants organize themselves? What specific acts comprise this activity?
What is the distribution of participants over space and time in these locales?
How are actors organized? What organizations effect, oversee, regulate, or promote this activity?
What do actors pay attention to? What is important, preoccupying, critical?
What goals do actors seek? When, from their perspective, is an act well or poorly done? How did the participant judge action – by what standards, developed and applied by whom?
What rewards to various actors gain from their participation?

The following segment of interview is coding to illuminate this process;

What I think you will also need organizationally is someone who understands the whole network and how the whole thing is put together. So you can then model and predict what is going on, understand what trends are occurring. And then model and predict what you need to do to make the trends to go better.

This paragraph provided initial insight of the underlying theoretic structure. The specific initial codes and memos were assigned as shown below.

What I think you will also need organizationally is someone (**intergrator**) who understands the whole network and how the whole thing is put together (**integration**). So you can then model and predict (**decision support, network lever action**) what is going on, understand what trends (**information generation**)

are occurring (**Knowledge based process aimed at value creation**). And then model and predict what you need to do to make the trends (**dynamic**) go better (**continuous improvement-consequence of the integrator in a performance environment**)

This section also generated a number of initial memo's

Memo: Is there a requirement for organizational change?

Memo: Is this also a change in mindset

Memo: Where does the information come from? Does this passage infer a knowledge management process? Is modeling and forecasting the only knowledge management conversion process?

Memo: How does the performance based arrangement effect contracts and partnering, particularly with respect to this continuous improvement process?, Memo: Initial concepts for theoretic code, integrator influence on knowledge flow, integrator alignment of network to performance outcome.

The codes show how the data is selected, separated, and sorted in search of the emerging analytic framework. The codes generated the "bones" of the analysis (Charmaz, 2006, p. 45). The bold words above are the codes assigned to each segment of text. This process was administratively easier, and more intuitive within MAXQDA. In MAXQDA a code is developed and then assigned to a segment of text, much like a tag. Coding continues assigning fresh codes to segments dealing with different concepts. In this manner text segments, representing similar phenomena, are easily assigned to a code using the drag and drop feature available in MAXQDA.

From the beginning the process allowed passages to emerge in a tentative theoretic structure. The research participant described a role to be played by "someone who understands the whole network", the segment was initially considered a person or function and coded as the **integrator** (this code held up in subsequent interview, although shifting from a processes oriented category to a well defined antecedent category under the **Integration**). Surrounding, and in some way related to the code integrator, were other distinct concepts and

processes. One was information, and with it was a process that appeared to in some way infer a conversion of information to knowledge (**knowledge management**). For the participant in the above passage modeling and forecasting formed the conversion process. Is that always the case? Also a dynamic output is within the passage that appeared to capture some type of improvement (inferred by taking action on the trends and forecasts).

Beneath the passage are a number of memos. Memos capture and record areas that were not clear or indicate an initial feeling or inference. The memos gave a place and structure to document the emerging relationships. The memos “provided the pivotal intermediate step between data collection and paper writing” (Charmaz, 2006). MAXQDA facilitates assignment of memos to both text, and to actual code. The initial thoughts captured in memos focused on the segments, and how these segments related to code, and the code related to other codes. Memos also provided a place to take notes for future follow-up. For instance the passage above inferred some sort of information process. If that is indeed the case, that process will, (and did), become more salient in follow up interviews (Information systems became a key antecedent category). Other questions involved how does that code (information) relate to other emerging codes (partnering dynamics)? Through memo writing, this insight was noted and identified for follow on action. Through memos and codes, the segments illuminate an initial theoretical structure. The process is repeated over and over again throughout the analysis.

The initial coding separates data into categories and reveals the underlying processes (Charmaz, 2006, p. 51). Initial coding was an assiduous process, but one required to keep from being immersed in the respondent’s worldview and losing objectivity as the researcher (Charmaz, 2006). After initial coding, focused coding followed. Focused coding increased the

efficiency of sifting through the most significant data and codes (Charmaz, 2006; Glaser, 1978). Focused coding was the start of the decision making process. This was the beginning of the ‘aha! Now I understand,’ experience which may, (and many times did), prompt reexamining the earlier data with the new insight (Charmaz, 2006, p. 58).

Through constant comparison, the initial interviews emerged a broad overview of the theoretical structure of the substantive area. Interviews flowed into focused coding, focused coding led to memo writing. The constant comparison technique provided an iterative process that deepened the dimension and abstraction associated with the emerging categories. During this process, similar codes clustered to become emergent categories. For instance integration emerged frequently in follow-on interviews. Interview and focused coding answered questions like “who should be the integrator,” and “what is the role of the integrator?” Codes emerged that defined and filled out the categories. These categories were then defined by sub-categories.

Charmaz (2006) recommends recorded and transcribed interviews. Emerging and shifting categories required a reexamination of earlier interviews. The addition of a new code many times illuminates an uncertainty or a hesitancy of a previous code. The fully transcribed interview provided tremendous ability to return to earlier segments in context and reorient the analysis.

Each major category contained an “unsorted code” bucket. This bucket contained emerging codes whose placement was unclear. The unsorted bucket provided a placeholder for codes, which seemed distinct, yet assignment to any existing category felt forced. This approach proved to be a very effective technique. Many times as coding and sorting continued,

these unsorted codes found a place as a category became more illuminated. Other times a group of similar, “unsorted” codes would illuminate a missing category. Reexamination of unsorted code resulted in the ‘aha!’, new insight providing a more effective theoretical base. The introduction of a new code and category impacted the emerging structure. Like a new variable in a structural equation modeling, the code and category, required a retrospective examination of the underlying “covariance structure” as the emergent theory formed.

MAXQDA supports a tiered structure to coding. The tier one code represented an emerged category, the tier two and three codes provide dimension to that category. The definition and explanatory power of a category benefits from an ability to assign multi-levels of codes beneath each category. The use of software, such as MAXDA significantly increases the administrative efficiency associated with that task.

Used well, grounded theory quickens the speed of gaining a clear focus on what is happening in your data without sacrificing the detail of the enacted scenes. Like a camera with many lenses, first you view a broad sweep of the landscape. Subsequently, you change your lens several times to bring scenes close and closer into view. (Charmaz, 2006, p. 14)

The interviews and analysis generated a broad model of PBL. General categories emerged implying concepts dealing with knowledge management, information, leadership, partnering, environment, integration, and mindset. The follow up interviews generated greater detail and more contextual insight into the theoretical relationships.

#### 4.1.3 Sampling, Saturation, and Sorting

Once the conceptual categories were filled out and the relationships explicated, the analysis turned to reconfirm relationships through theoretical saturation (Charmaz, 2006;

Glaser and Strauss, 1967b). At this point the emerged theory is approaching the right side of Figure 3.

#### 4.1.3.1 Sampling and Saturating

Sampling in grounded theory is “aimed toward theory construction, not for population representation” (Charmaz, 2006, p. 6). The sampling strategy focused on identifying the underlying structure involved in the substantive area. This sampling approach is similar to other marketing research programs aimed at inductively generating theory (Kohli and Jaworski, 1990; Noble and Mokwa, 1999; Parasuraman et al., 1994a). The sample programs represent organizations undergoing various stages of the transition to a performance-oriented strategy. As the grounded theory emerged the sampling evolved as necessary to saturate the dimension of the categories. For instance, an industry sponsor recommended that the investigation consider a firm program that was not engaged in PBL. That particular group of interviews provided contrasting insight.

The final set of investigated programs represented a broad range, from those adhering to a traditional product based strategy, to those converting, or having converted to PBL. Two programs were designed from the ground up as full PBL. Additionally the protocol included research participants from multiple functional areas (engineering, contracting, logistics, and new business). This approach provided full dimensionality of the substantive area, insight, and subsequent theoretical saturation of key concepts and variables.

The interviews were scheduled in a manner that minimized the impact on the participating organization. In most cases the interviews adopted a batch approach to support interviews at the participating organizations’ location. The batch process reduced the



administrative burden associated with visit notification and scheduling of interview rooms. Since many were DoD contractors, security protocol required a somewhat burdensome visit notification process. These constraints required an approach led to conducting more interviews, representing a broader functional spectrum and level, within the business than necessarily envisioned. The approach generated more interviews than probably necessary however the approach reduced the chance that on-site re-interview would be necessary.

To minimize burden on the organizations interviews were scheduled in a batch process. Typically 3 interviews were scheduled for 45 minutes each in the morning, and four interviews were scheduled for 45 minutes each in the afternoon. In this manner questions illuminated in a morning interview were easily pursued in an afternoon interview or these questions were addressed the following day. The participants came armed with ideas and opinions; they discussed what it was they wished to discuss. The next batch of interviews provided a venue to address the questions raised during transcription and coding. As required the research participants responded to questions by phone call or email.

Immediately following a batch of site-specific interviews, transcription, and coding began on the interviews that represented broadest functional diversity. For instance interview protocol may have resulted in first day interviews from engineering functions, the next day contracting, and so on. However, the coding protocol cut across functions, one interview with engineering than contracting, then finance, etc. This coding continued until the site-specific variables and relationships became repetitive. Then the next set of interviews were scheduled and conducted. When new categories emerged review of previous interviews usually generated further insight. As the process continued, previously uncoded interviews were coded as

necessary to illuminate and refine categories and relationships. This process resulted in effective theoretic sampling using both follow up interviews and coding of previous uncoded interviews. Interview continued until repetition across programs and functions emerged. This repetition is what grounded theorist call saturation (Charmaz, 2006; Glaser and Strauss, 1967b).

Adherence to this process resulted in saturation of the categories and development of theoretic relationships. After the twenty fourth interview, the code, category, and relational structure stabilized as indicated by Charmaz:

Fresh data no longer spark new theoretical insights nor reveal new properties of these core theoretical categories... Saturation is distinct from repetition of detail, in saturation nothing new is happening. (Charmaz, 2006, p. 113).

Saturation raised the categories to an abstract and general level. This abstractness became evident as the categories, and theoretic relationships stood up to the test of “ok, how about this situation” in follow-on discussions with industry and academic experts. The emerged theory, inductively derived, became increasingly, abstract, flexible, and applicable. Figure Four graphically depicts the analytic process from which empirical segments of interview are coded and made increasingly abstract and theory laden.

Figure 4  
 Moving from Empirical to Abstract; the Analytic Process of Grounded Theory Emergence

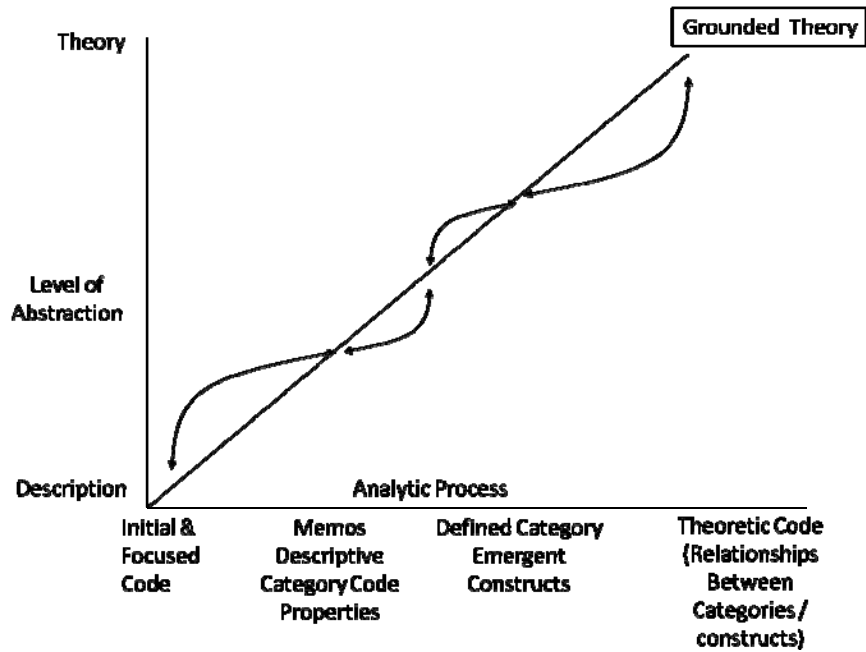


Table 13 indicates the guideline used to assess saturation of the categories (Charmaz, 2006, p. 113). The logic of saturation argues “that you keep sampling until your categories are saturated and that this logic supersedes sample size” (Charmaz, 2006, p. 114).

Table 13  
 Guidelines for Assessment of Category Saturation (Charmaz, 2006, p. 113)

Which comparisons do you make between data within and between categories?
What sense do you make of these comparisons?
Where do they lead you?
How do your comparisons illuminate your theoretical categories?
In what other directions, if any, do they take you?
What new conceptual relationships, if any, might you see?

Overall the interview and batch sampling approach minimized impact on the organization, while ensuring the objectives of theoretical sampling. The resultant categories, subcategories, and their relationship met the criteria laid out by Charmaz (2006, p. 104):

1. Delineate the properties of a category
2. Check hunches about the categories
3. Saturate the properties of a category
4. Distinguish between categories
5. Clarify relationships between emerging categories
6. Identify variation in a process

In an iterative process, sorting completes the task of saturation. The next section presents the detail of sorting.

#### 4.1.3.2 Sorting

Grounded theory is inherently a nonlinear process. The sorting of categories, and building of their interrelationships occurs throughout the analysis. Sorting is the analytics process of evaluating codes, their emergence into categories, and the memos outlining the relationship between categories and other categories;

Sorting gives you a logic for organizing your analysis and a way of creating and refining theoretical links that prompts you to make comparison between categories (Charmaz, 2006, p. 115).

By the end of the first series of interviews an initial structure emerged (Charmaz, 2006; Glaser, 1978). The use of models, and their evolution, supported the process of sorting in this investigation. Constant comparison resulted in model creation, re-creation, definition, and redefinition. This process resulted in dozens of model iterations.

During the process of coding and categorization the MAXQDA application MAXMAPS, provided a robust tool to support sorting. As memos captured the emerging theoretic relationship MAXMAPS provided an intuitive tool to diagram and document categories, to

include sub categories, and theoretic relationships. The ease of this process resulted in an effective human factors edge to grounded theory. The intuitive nature of the software tool eased the arduous work associated with grounded theory. The decreased administrative burden created more motivation to tackle new insights, variables, and relationships.

In the course of the analysis new insight required a resorting of codes and categories. For instance constant comparison, review of literature, and discussion with an academic strategy expert revealed that a major category was incorrect and required resorting. About half way through the analysis the idea of governance appeared to emerge as a code, and then a category. While there was clearly “something there” the category was difficult to describe in relationship to other categories. The category appeared to be split and in some way incongruent with the emerging theory. The analysis seemed to indicate that the code dealing with governance structure was more representative of the macro shift from a product to performance-oriented environment. The conceptual idea of governance was evident in the data, but seemed more rational as a context for the overall grounded theory rather than a category.

With this insight, the “Aha!” moment occurred, what seemed to be some sort of governance structure affecting decision making within the model emerged more appropriately as the category mindset. From a sorting standpoint, this “Aha!” moment represented significant follow-on analytical rework. At that time governance had 93 segments, and 32 codes. Each of these required re-evaluation for application within the shifted theoretical framework. Resorting, recategorizing, and redefining of these codes increased the coherency of the resultant iteration of the grounded theory. MAXQDA made this process administratively easier.

When governance was initially questioned, broken up, and spread to other categories the MAXQDA enhanced the efficiency and effectiveness associated with this process. The ability of MAXQDA to activate, retrieve and associate segments with codes and text, reduced the administrative burden. The MAXQDA software, like many other research support tools (LISREL, SPSS, and SAS), reduced some of the difficult, yet non-intuitive, tasks associated with the analysis.

The sampling, sorting, and saturation occurred after 24 interviews. Saturation was confirmed by a number of follow-up member checking sessions where the emerged theory was presented and discussed. Figure five presents the emerged grounded theory that emerged through this analysis. The following section provides a detailed explanation of the categories and their relationships.

#### 4.2 Emergent Theory: Categories, Relationships, and Propositions

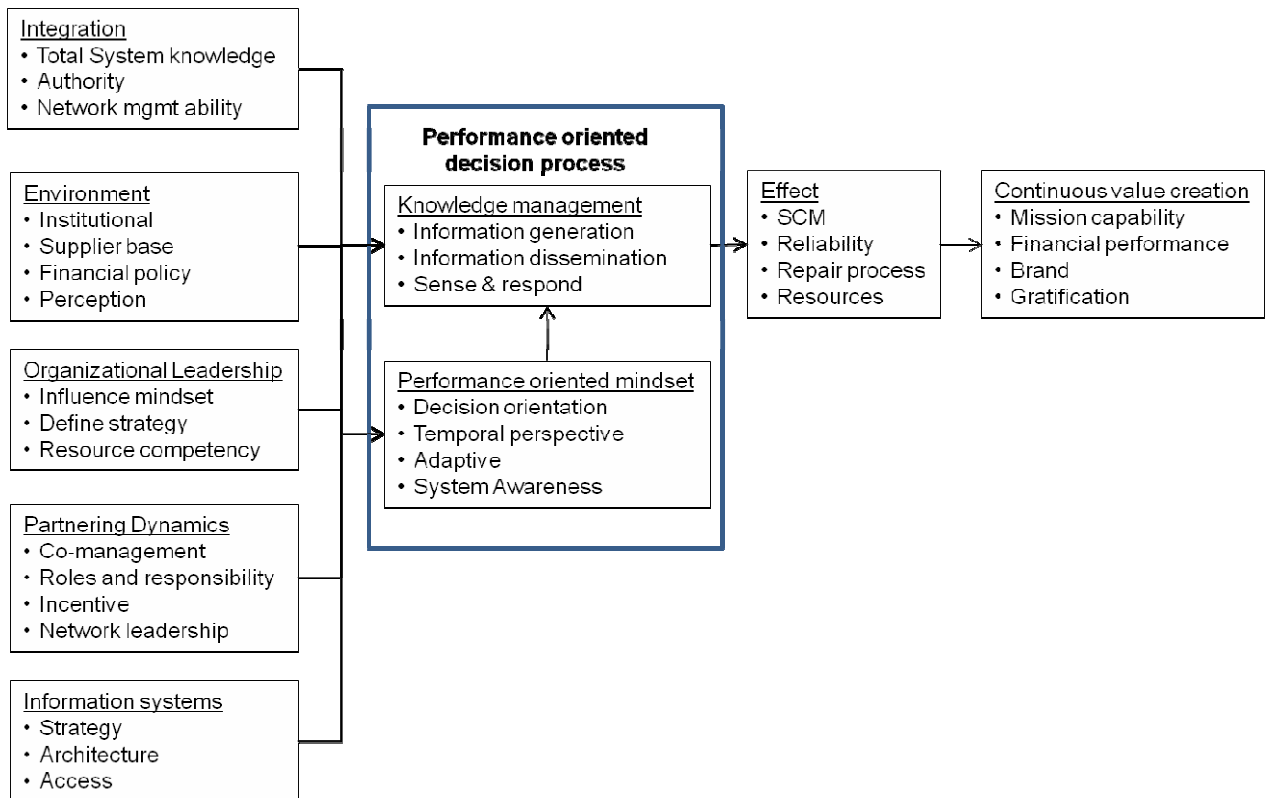
Figure 5 represents the emerged theory generated in this research. The presentation of a grounded theory, in a theoretical framework, aligns with a positivist perspective that “seeks causes, favors deterministic explanation, and emphasizes generality and universality” (Charmaz, 2006, 126). This section presents the categories and sub-categories of the emerged theory, along with their relationships. To illuminate the analysis interview segments are included. These segments represent only a small sample of the overall coding/analysis. There were thousands of segments coded and hundreds of codes created. The segments are generalized as required for readability and to obscure any particular program or personal identity. In addition, program unique terminology is converted into a more generalized and understandable form.

The goal of the segment presentation is to illuminate the general logic of the theory, increase the reader’s awareness, and garner support for the conclusions.

Interviewer: so what is performance logistics? Is it a contract? Is it a business case? Is it a strategy? What is it?

I believe it is a mindset. I really believe that PBL today is personality driven. If you have intuitive knowledge of what PBL can do, yes you will do well at it. But if you are just learning what PBL is you will not be very good at it.

Figure 5  
Performance-Oriented Network Theory



The abstract theoretical relationships are best visualized as a thread running from the left side of the model (the antecedents), through the processes (the middle section), and their effect on the outcome (the right side of the model). Each interview, and each paragraph of discussion, laid down a new thread. Subsequent interviews laid down more threads, defining the path, and intensity of the relationships. The end result was a weaving together of the individual threads

to form a mosaic of the underlying structure of a performance-oriented environment. The result is a model that (Charmaz, 2006, 126):

1. Treats concepts as variables: The core construct in the grounded theory is the performance-oriented decision process. That process is composed of two elements, knowledge management and performance oriented mindset. The antecedents of the process are integration, environment, leadership, partnering dynamics, and information systems. Consequences of the core construct are effect and continuous value creation.
2. Specifies relationships between concepts: The placement of the categories within the theoretic framework specifies the relationships.
3. Explains and predicts these relationships: The analysis provided the explication of the grounded theory within the theoretic framework.
4. Systematizes knowledge: The framework efficiently systematizes the emerged macro-level network model.
5. Verifies theoretical relationships and hypothesis testing: The use of theoretical sampling, constant comparison, and abduction, verified, through saturation, the relationships.
6. Generates hypothesis for research: The analysis provided a broad range of research propositions supportive of follow-on deductive investigation.

The central process emerged is the performance-oriented decision process. The outlined box in Figure 5 shows this process. The performance-oriented decision process is composed of knowledge management and the moderating effect of the performance-oriented mindset. The next section presents the performance-oriented decision process. Following that the discussion turns to the antecedents of that process. The antecedents are integration, environment, leadership, partnering dynamics, and information systems. Last the discussion presents the outcome categories. The outcome categories are effect and continuous value creation. Presentation in this manner allows for a coherent “unweaving” of the theory without degrading its interrelated nature.

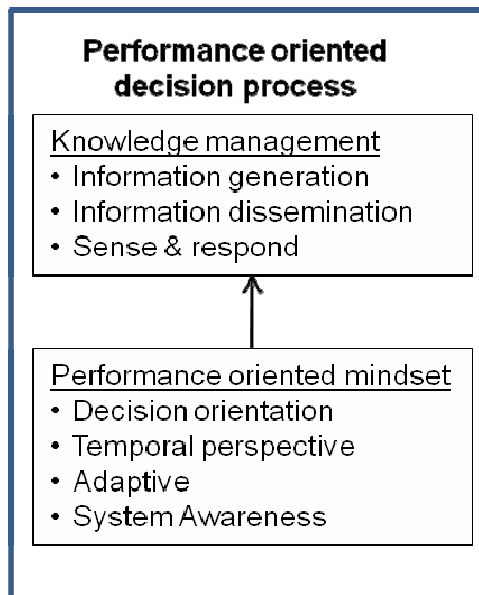


#### 4.2.1 Performance-Oriented Decision Process

The core construct of the performance-oriented network model is the performance-oriented decision process. The performance-oriented decision process is composed of knowledge management and the performance-oriented mindset. The network entity inclination act upon new knowledge in pursuit of a dynamic goal leads to continuous value creation.

The interviews revealed a strong focus on knowledge management by those engaged in, or converting to, a performance-oriented strategy. The key process that emerged dealt with how decision converts knowledge to value. What appeared to be the seminal insight of the performance-oriented strategy grounded theory involved how members of the network make decisions, what enabled efficient decisions, and how the individual's mindset influenced the performance-oriented decision process. In an initial interview one of the participants discussed how they conceptualize the ability to "sense and respond." The code "sense and respond" captures the essence of evolutionary sustainment. The participants conceptualized this process as the ability to sense actionable knowledge and respond in a manner that impacts value. The analysis revealed knowledge management, and the performance-oriented mindset represents a performance-oriented decision construct coherent with sense and respond. Figure 6 presents the performance-oriented decision process.

Figure 6  
Performance-Oriented Decision Process



#### 4.2.1.1 Knowledge Management

Senior executives devote a great deal of thought about the how and why of a performance strategy. The executives recognized the requirement to move from a focus on delivering an end product to a focus on providing performance. Leading edge performance-oriented strategists focused on creating value for the customer and the network partners through actionable knowledge generation and dissemination.

Form the very first meetings, industry executives focused on how the shift from product to performance sustainment required a reexamination of the role of knowledge. This shift permeated all aspects of the business. A number of the aerospace executives wondered how best to make a shift from a product-oriented engineering company to a performance-oriented, engineering enabled, company capable of providing world-class sustainment;

Knowledge is highly important. You have to have it. Everyone needs to know clearly what the bounds of the performance parameters are. You need to know

the supply chain knowledge... You have to know the supply chain at every step. You have to know the government and end user requirement. You have to know if the supply is going to be available in case I have to plan to surge. The prime needs to know that industry can fulfill that (requirement). The subcontract base needs to know what kind of demands are going to be put on me to where I have to help support. So you have to have knowledge that flows through kind of a circle.

Performance-oriented strategy conceptualizes knowledge flow as a circle. Knowledge is linked to customer “performance parameter”, the network (supply chain), dynamic performance requirement (surge), integration (prime), the partners (sub-contract base), and feedback (knowledge in a circle). The analysis substantiated this segment. Performance requires knowledge generation, dissemination, and the ability of the entity to sense and respond through an effective and efficient decision processes. The segment highlights how the performance-oriented strategy shift ensures knowledge availability, and that the information is in a form supportive of the network strategy. Value in this process is co-creation between the customer network wide generation and dissemination of knowledge. Information is transformed to value as “knowledge that flows though kind of a circle.” Information becomes knowledge when some entity senses the potential of that information on the performance oriented decision process, and responds with that information. For instance temperature of a system at time of failure is information (or data). Temperature at time of failure becomes knowledge when the network strategy captures (sense) this information with the intent to understand root cause and improve design (respond).

In response to questions on “how you do PBL?” Or “what is the core process of PBL?”, the research participants discussed knowledge. Knowledge and knowledge management came up hundreds of times during the interviews. The more advanced the PBL strategy the more

intricately imbued was discussion of knowledge management, and knowledge management systems in the quest for superior financial performance. Knowledge management was what linked decisions, the network, and a performance output.

We have to have knowledge of everything that impacts the system performance outcome, so that when we look at it, it is not just necessarily a number. It is here is the metric... what are the restrictors to achieving that metric? What are the things that we can control? What are the things that we cannot control? What are the worst-case resources? Are there certain resources that we need, that are going to, because of non-availability or lack of ready availability that could impact that performance outcome? What is the availability of that resource? Is it lead-time? If I am not going to get there, what is the next option? What are the restrictions the customer must figure a way around?

This segment reveals that a performance-oriented strategy requires:

1. Knowledge of the system
2. Knowledge of how the system is performing
3. How the customer perceives that performance (outcome)
4. Knowledge of increased value potential in the network
5. How to leverage network value potential
6. Role of knowledge management and ability to sense and respond
7. Decision that results in optimal effect

The ability to leverage knowledge from the network partners in a timely and efficient manner creates value. This value creation requires knowledge not only of the customer's perception of performance requirements but also knowledge management that is fundamentally relational with the network suppliers;

So it is not like we are dictating down to the vendors, it is like they're helping us. Because they have all this wealth of knowledge.

Knowledge of the system and ability to convert that to outcome generates value. The network co-creates a value proposition by harnessing knowledge today in a more efficient and effective manner than yesterday. Knowledge management, knowledge of customer perception of performance value, coupled with knowledge of supply chain member resources increases the

probability that decisions made will increase overall network performance. Knowledge generation has a probabilistic impact on effective sense and response. The performance-oriented network knowledge management requires the ability to generate knowledge, and disseminate knowledge in a fashion that efficiently increases the effect of discrete decisions. The performance oriented network harnesses knowledge in the pursuit of evolutionary “cost and performance curves.”

#### 4.2.1.1.1 Knowledge Management (Information Generation)

Knowledge value is value in use. Value in use requires that network systems disseminate generated knowledge to entities most capable of responding with that knowledge in a network-optimized fashion. The value proposition for the network is based upon the probability that some entity will act more efficiently due to exposure to the generated knowledge. The efficiency is based upon the probability that the value generated is greater than the burden associated with generation, dissemination, and response based upon that knowledge.

According to research participants, the objective of the performance-oriented strategy is to increase the affordability and performance of the weapon system. This concept permeated the discussions. The outcome objective in a performance-oriented program is non-static. When asked how this differed from a product-based approach the participants indicated the performance-oriented approach was more dynamic. This approach seeks greater knowledge from which to dynamically improve decisions. The first step in that process involved generating knowledge;

Interviewer: okay so you're working in performance based logistics, what does the term performance logistics mean to you?

Performance is outcome, it is an outcome based set of results that meet requirements and needs of your customer. Simply outcome based production.

Interviewer: So how does that compare, in your perception, to previous strategies that are more product centered?

Product base is you are only interested in delivering to what is aligned to the contract. Whereas outcome based you are interested in more providing the service that meets a need of your customer. A value added to them.

Interviewer: Does that change the dynamics of your relationships with your customer? How?

Yes. It becomes more interactive with them, focused on what they need, and how you can help provide that need. Rather than saying this is what they contracted for, and this is what they get.

Interviewer: Ok, would it be fair to say that it is more of a dyad?

Yes it is more of a dyad in more of a relationship based, versus a strict contract based, transactional type.

The performance-oriented strategy is “outcome based”, and that outcome is oriented to the “needs of the customer.” The segment contrasts product versus performance strategies.

Product strategy has an air of a static, more limited “only interested in delivering to contract” transactional relationship. Whereas the performance strategy is oriented toward meeting the needs (the value desired) of “your customer.” A performance-oriented approach involves a dyad where the network actively seeks knowledge of the customer’s requirement. The relational partnership provides an awareness of the customer’s value proposition. This awareness increases the ability of the network.

Generation of knowledge from the network partners increases the probability that a decision results in greater overall value. This decision process requires, and leads to, a more focused strategy with respect to the network participants;

So we know a lot of these suppliers have a lot of experience on PBL. So what we have done is formed a working group. So what we have done is formed our strategic supplier working group. I have asked for volunteers, because this is not in their contracts. This also has folks from our side, the business people, the supply chain people, various other functions. That make up this group. And I bring hard problems to the table, and we as a group begin to work the problems. Because I have to have their (suppliers) input, because so much relies upon them, on this program...

That is how we keep them focused, because we always bring our problems, here is how it relates to you. Now help us to figure out what is the best way to do it. So it is not like we are dictating down to them, and it is like they're helping us. Because they have all this wealth of knowledge.

Interviewer: so it is more of a collaboration?

Most definitely a collaboration.

A performance-oriented strategy amplifies co-creation of value through knowledge gained from the supplier base. This is a shift from a product-based strategy where suppliers are “squeezed” in a least cost bid, focused on reducing cost. In the performance environment the supplier represents a source of potential value. The supplier in a performance-oriented approach ascends to a position well beyond providing the purchased good, “because they have all this wealth of knowledge.” The shift toward performance-orientation requires collaboration to harvest this potential wealth. The performance strategy drives a relational structural to satisfy competitive knowledge based value propositions.

The government and industry participants focused on the generation of dynamic knowledge. Dynamic knowledge generation seeks a broad spectrum, such as temperature of a part at failure, financial knowledge, institutional knowledge, logistical knowledge, and more. The executives and managers articulated that the performance-oriented decision process required new sources and approaches to knowledge generation. The very existence of this

research underscores this point. One industry executive mentioned that this was the first non-engineering dissertation that their firm had ever sponsored. The requirement to generate new forms of knowledge was clear. Knowledge in a performance-oriented strategy is the raw material that spurs continuous value creation.

P1: Increased actionable knowledge generation positively influences the effect of the performance-oriented decision.

However, those raw materials must first be transferred to the “knowledge conversion factory.” The analysis illuminated the next element dissemination of actionable knowledge. Dissemination is the inbound transportation of that raw material.

#### 4.2.1.1.2 Information Dissemination

Knowledge generated, to be actionable, requires dissemination. Greater dissemination of actionable information increases the probability that a decision will result in continuous value creation. The performance-oriented strategy leverages knowledge to provide continuous value creation. The knowledge is generated network wide. That generated knowledge takes a step closer to becoming value when the knowledge is disseminated at the time, place, and to the entity, most capable of sensing the value of that knowledge and responding in a manner which positively impacts the network’s value proposition.

In a knowledge enabled performance-oriented strategy the focus on actionable information takes central stage:

Because I’ve got to be able to take a problem to the customer decompose it into what is actionable. And then put back together a solution that isn’t just another transaction. But will assure an improved level of performance.

Dynamic performance requires an ability to take a customer value metric (such as mission capable rate), decompose that metric, and disseminate those decomposed parts in a way that



is actionable. This process requires a co-management of the customer value proposition and the ability to decompose that value proposition in a manner that allows creation of a new solution that *improves* performance. The participants understood that data needed to flow in a form that increased the likelihood of positive outcome:

The source of repair (supplier) drives that performance as well. So they have to be aware. They got to have all the data flow to them.

They got to have the data in a form that is actionable and digestible. Then they have to be able to take action on the drivers. And if your aircraft availability is your focus, you have to be able to take action in with both the customer and supplier areas.

The network members (source of repair) must have knowledge generated and disseminated (“flowed”) to them in “actionable” form, and “focused” on the aggregate level goal. The segment demonstrates that an integral aspect of a performance-oriented network is “awareness” that provides actionable data. This awareness enables activities (decisions) focused on the drivers on customer value metric. The drivers are those things that inhibit the next level of performance.

The shift from product to performance-oriented approach reveals the significant shift in the nature of the outcome and the requirements for dynamic knowledge. In the performance-oriented strategy, achievement of continuous value creation requires new actionable knowledge available in a timely manner to network partners;

It is really the functional aspect of managing those relationships. You have to make sure the right knowledge is getting to the right place, at the right time. Making sure that all of the actors and players that need the information have it. Understanding what is driving that activity, and what impacts the activity will have over the long term. Part of achieving the performance requirement is making sure that all understand the requirements.

The performance-oriented strategy interconnects relationship through shared knowledge disseminated to the right place at the right time. The segment highlights how the performance-oriented approach recognizes the central role of knowledge in the new environment. The process is to “make sure all of the actors” that need (generation) information have (dissemination) information from which to make a performance oriented decision (long run impact). The knowledge-enabled strategy elaborates time and place utility of knowledge. The network optimal outcome relies on time based efficiency (right time), a system level awareness (requirements understood by all), knowledge to the right entity (right “place”) to achieve continuous value creation.

The investigation revealed the managers treat time as a place utility for knowledge. The more leading edge programs store tacit knowledge. A code emerged called “temporal dissemination.” One executive vice president discussed the need to have an information dissemination architecture, and mindset that enabled a “reach back in time.” This perspective interlaced the interviews. One academic expert labeled this “temporal reach back” process knowledge capture. Temporal dissemination emerged as a requirement to capture current employee:

1. Dynamic knowledge of how the current system performs
2. Knowledge of potential future system failure
3. Knowledge of emerging technology not mature enough for current production
4. Knowledge of “what would you have really liked to have done

The emergence of a temporal knowledge capture driven by a performance-oriented execution underscores the knowledge-based shift at the center of the product to performance-oriented evolution. The idea makes remarkable intuitive sense; the engineer designing the system today is generally most knowledgeable of where this system might fail sometime in the

*future*. Additionally that engineer is likely most aware of emergent technologies which might improve reliability but are not mature enough to be included at production *today*. The chore is capturing tacit (or causally ambiguous) knowledge in ways not possible using 2 dimensional configuration documentation and detailed specification. This temporal knowledge quest highlights an understanding in a performance-oriented strategy that multi-dimensional knowledge dissemination is required to achieve continuous value creation.

The respondents placed a premium on ensuring timely and accurate information made available to the right people, “at the right place, at the right time.” This requirement seemed to call into question the value of protecting information in a performance-oriented network. Protection of information inherently constrained dissemination. Those interviewed appeared to reconsider the historic desire to guard proprietary value. The more leading edge performance-oriented program seems to tip the balance toward more ubiquitous information dissemination.

The ability to align the industry at all tiers on the desired performance outcome (customer measure of value) reshaped ideas and strategies with respect to information dissemination. Discussing the value of field service representatives (industry experts co-located with the customer) one industry manager said,

I will improve reliability, I will improve the efficiency... I will give them all of the engineers back here (at the designing organization) on a first name basis. The field representative can pick up the phone and ask the engineer a question. And I am going to give the field representative a cell phone, I will give them Cingular. The network, I will give the customer that big network behind them.

Direct co-management between the designer and the customer potentially improves reliability and efficiency. The use of the metaphor “Cingular, the network” illuminates the idea of increased connection with customer, increased connection speed, and connection with entities

capable (authorized engineers) of improving the process quickly. Performance oriented strategy requires efficient dissemination of actionable knowledge.

P2: Increase dissemination of actionable knowledge positively influences the effect of the performance-oriented decision.

Efficient dissemination appeared as the link between generated knowledge and decisions that leads to performance improvement. The research participants described the overall process of generation, dissemination, and response “is like a loop”. The loop is closed by the ability to sense the actionable knowledge and respond in a manner that leads to continuous value creation.

#### 4.2.1.1.3 Sense and Respond

The analysis demonstrated the ability to sense actionable knowledge and respond with efficient effect as the engine of performance-oriented (knowledge based) strategy. Sense appeared as the inclination to look for actionable performance-oriented knowledge to increase the probability that the decision response will achieve continuous value creation. Greater performance-oriented sense and response appeared as the evolutionary decision making process in a performance-oriented strategy. Response through decision closed the knowledge management loop. In performance-oriented strategy knowledge conversion through decision forms the source of continuous value creation. The network factors that provide unconstrained solution sets positively influence the network value proposition.

The interviews emerged numerous success stories of performance-oriented decisions resulting in improved reliability, improved repair process, or improvements to the supply chain management function. There were also stories of how lack of a performance-oriented sense and response inclination resulted in missed opportunity and negative consequence. In some

cases the decision had a direct effect on performance outcome, such as redesigning a part to improve reliability. In other cases decisions led to a second or third order capability to provide continuous value creation. For example, the decision to send personnel to training, or to invest in more coherent information management systems, generates a second order effect.

Sometimes environmental factors constrained the network's optimal decision. The interviews showed the performance-oriented decision process as inherently dynamic, increased flexibility positively influenced the processes. In some cases a respondent mentioned that current policy restricted optimal response. These participants noted that many of the current sustainment policies were oriented toward a product based compliance approach. Those policies constrained response in a performance-oriented strategy. The performance-oriented strategy requires an update to these policies.

The analysis revealed a link between the ability to efficiently sense and respond and the use of decision support tools. The more advanced the performance-oriented program placed greater emphasis placed on decision support tools:

Like in the case of one of our programs converting to PBL, when we took a look at it, in order for people to do better work they needed better decision support tools. People make better decisions with better decision support tools.

There is a relationship between PBL, knowledge, and tools that increase the ability to sense and respond. "Better work, requires better decision support tools", in this perspective decision is the core activity and "people perform this core activity better with better tools." This was a remarkably simple yet powerful insight. The transition to a performance-oriented strategy drives to, and is driven by, increasingly effective and efficient decision support tools. There were hundreds of segments coded that dealt with decision, decision support, and business

decision processes. One research participant captured the impact of decisions and decision support tools on performance outcome:

Our resource managers are being entrepreneurial; they are somewhat like item managers but somewhat like engineering specialist and like logistics specialist. So we created a new job category of people and we went and picked, because they have experience with the customer they have this mindset they have good decision support skills. Most of them are ex-military; we looked for people with maintenance experience, and engineering backgrounds. So they understand the needs of the customer. They understand the needs of support. They also have a system that helps them make smart decisions on demand patterns and economic order quantities. And by helping them with a better decision support tools we get a better product. We think we have a good people but it's not just good people, it is giving them good information to make their decision and to do their planning with.

The performance-oriented strategy requires an “entrepreneurial” sense and response aimed at dynamic performance. This knowledge-decision conversion-value generation construct creates a “new job category” requiring “people that have a certain mindset.” The job category is “decision support tool assisted knowledge based network connected entrepreneurial decision maker.” There is a link between a cognitive mindset, network orientation, total system awareness, and an ability to use previous experience (background) to understand the need of the customer. Achieving competitive advantage in knowledge centric environment requires increasingly effective decisions and decision support tools.

P3: Increased efficiency of sense and response positively influences the performance oriented decision process.

In the performance-oriented environment mindset emerged as a significant moderator of the performance oriented decision process.

#### 4.2.1.2 Performance-Oriented Mindset

Mindset emerged as a significant moderator of the knowledge conversion process. Mindset influenced network optimal alignment of the performance-oriented decision process. Performance-oriented mindset adopted a cross-temporal agility. The performance-oriented mindset responded to the dynamic environment in an adaptive manner. The performance oriented mindset maintained a network level awareness.

In the shift from product to performance, mindset shifted from compliance logistics to entrepreneurial logistics:

Interviewer: so what is performance logistics? Is it a contract? Is it a business case? Is it a strategy? What is it?

I believe it is a mindset. I really believe that PBL today is personality driven. If you have intuitive knowledge of what PBL can do, yes you will do well at it. But if you are just learning what PBL is you will not be very good at it.

The participant links mindset with intuitive knowledge, and intuitive knowledge to improved performance. This insight contains a tremendous proscriptive implication. This finding suggests that leadership can train or guide the intuitive mental ability. This segment captures succinctly that PBL is a mindset, and mindset influences the sense and response decision processes:

Sometimes by putting a PBL construct on a program you now make support provider responsible for metrics that are tracked on their side and by their bosses; you give them a new mindset.

The use of actionable metrics pulls entities into the performance-oriented mindset. The performance-oriented approach is about relationships, collaboration, and definable accountability. The “new mindset” improves efficiency of the decision by focusing the decision maker and the reward provider (their bosses) on metrics. The metrics represent the

decomposition of the co-managed measure of customer value. Mindset represents the mental governance structure that influences the entities decisions toward evolving value propositions.

Mindset in this context is what governs and gives pattern and coherency to decisions and choices. This is a significant and exciting insight. Analysis demonstrated that mindset appeared to be a more actionable construct than culture in a performance-oriented network. The performance-oriented entity optimizes sense and response in a manner tangibly linked to continuous value creation. Those of a performance-oriented and product-oriented operated in the same organizational culture. Understandably the emergence of the performance-oriented mindset created tension as two entities with differing paradigms attempted to coexist:

Most of those people do not come in to work saying you know I think I will be a bureaucrat and screw things up today. But they were raised and trained in an environment focused on compliance. With rules as opposed to problems solving.

Performance-orientation is a shift away from compliance and toward problem solving. Problem solving is an inherently dynamic decision and knowledge focused activity. The task for leadership is to use training and environment to reshape mindset to approach issues not as a compliance opportunity but as a problem solving opportunity. The performance-oriented logistician does not sense a problem but instead senses an opportunity to improve the value proposition offered by the network.

The shift in mindset represents an entrepreneurial approach to aligning the network toward continuous value creation. This alignment increases the probability that solutions today will improve upon solutions from yesterday:

In today's world you have a lot of supply chain; it is a mindset switch with your supplier base as well. You have to incentivize them to do for you what you are essentially doing for the end user.



The inference is that government, focal firms, and the lower tiers of a supply chain network require a mindset shift to optimize network performance. The interview segment reveals that a network wide solution set is available in a performance-oriented strategy; “you have a lot of supply chain, it is a mindset switch with your supplier base as well.” In subsequent member checking, senior executives seized the idea of mindset. Mindset represented an actionable construct through which to improve the performance-oriented strategy success. One senior executive going so far as to say (as summarized from notes of two participants):

We should pull out a group of people and train them for a year to think this way. You could then add these people all over the company to influence the company towards this new direction.

This segment suggests mindset can be leveraged in a proactive fashion. The performance-oriented strategy mindset positively influences continuous value. Mindset emerged as a seminal finding. Mindset is composed of four elements. The first element, decision orientation is the mindset attribute that senses and responds toward dynamic rather than static solutions. The second element, temporal perspective, is the element of mindset that adopts a long-term decision orientation. Adaptive is the mindset element that contacts environment, learns from that contact, and improves upon subsequent decisions. The last element, system awareness, is the mindset attribute that maintains system level cognition and impact.

#### 4.2.1.2.1 Decision Orientation

The analysis revealed decision orientation as a shift away from a static, product, compliance, specification-oriented decisions, to a more dynamic evolutionary sense and respond decision orientation. The decision orientation in a performance strategy requires

generates a more “entrepreneurial approach.” This approach seeks information, generates and disseminates that information across the supply chain. Increased “actionable” information, leveraged by a mindset oriented toward a dynamic outcome, positively influences the continuous value creation process:

The difficulties we have been running into are more bureaucratic than anything else.

If a broken part has a wrong identification number on the repair paperwork, our people would like to fix the paperwork and get the part out of there. The identification number is on the broken part. So get it out of there and get it fixed. The individual responsible with enforcing contract/policy procedures says oh no you have to get the paperwork fixed by the user...and he is eating up three or four days of my process to get that thing fixed...

The shift to the performance-oriented strategy creates tensions as two paradigms (mindsets) attempt to coexist. Individually these mindsets act consistently with respect to their relevant training, expectation, and upbringing. However acting together the product and performance entities find each other incomprehensible. The performance-oriented mindset focuses on a dynamic output. Thus the decision is intuitive to change the tag. The performance-oriented strategy captures the process failure (wrong tag) and disseminates that knowledge to increase the probability the process will not fail again. The knowledge generated enables another entity to create a checklist with respect to tags, or invest in RFID that does away with all tags. These decisions align with a strategy that increases performance, generates quicker repairs, requires fewer parts, and provides greater cost efficiency.

The other mindset is more product-oriented. The overriding objective in the product-oriented approach is to comply with processes and specification. The manager’s overarching responsibility is to ensure the consistent quality associated with the process. From this

perspective the tag story may represent one of a thousand different discrete transactions in which the incentive structure rewards enforcement and compliance. Thus the mindset adheres to policy. Based upon the entities world view (compliance or entrepreneurial) mindset orientation affects sense and response:

How you make decisions, different folks can take a problem apart and make decisions at the piecemeal level. Others tend to say okay we need to make a decision at the strategic versus tactical level if you will. There has to be a good blend. The real tendency when you have a lot of, and I use the word mechanics. But I think you used product focused. If you have a lot of product focused people, the summation of decisions, does not necessarily get you to your strategic goal.

The product to performance-oriented strategy shift requires a rebalance and redefinition of strategic versus tactical decisions. The goal for the performance-oriented network leader is to engender a mindset that results in summative decision processes aimed toward continuous value creation.

The performance-oriented mindset seeks (senses) knowledge to continually improve response. The performance-oriented mindset broadens the cue of potential solution sets. The performance-oriented mindset breaks away from a constrained product-based paradigm of least cost suppliers and orients on a value-based paradigm that recognizes (senses) the knowledge wealth at the edges of the supplier network. In response to a question on who is most capable of improving repair procedures a senior sustainment manager said:

The vendor in my opinion. The vendor is most capable of fixing the product, they know so much.

This is a powerful statement “they know so much.” The individual making the statement is a senior logistician in the focal firm of a leading edge of performance-oriented sustainment network. The recorded response was quick, unhesitant, respectful and without arrogance. The

key to impacting the continuous value creation “is the vendor”, the reason that the vendor is so valuable is that “they knows so much”. The performance-oriented logistics manager seeks understanding of how best to improve design and subsequent performance in search of continuous value creation. Performance-oriented partner selection is based upon not only best value today, but best future value proposition potential; not least cost.

This research indicates that the decision orientation in a performance-oriented environment shifts toward dynamic decision where the solution (decision) tomorrow will most likely be different, and more optimal, from the solution today. New information perceived by an entrepreneurial mindset is poised to increase the probability of attaining continuous value creation by acting on new knowledge in a timely and efficient fashion. The performance oriented network harnesses modern information systems, modeling systems, and system level expertise to evolve the product in an airworthy manner.

In response to how such decision orientations emerge, a number of participants indicated that the incentive structure must shift to reward the entrepreneurial decision orientation. In other cases participants suggested newer generations might be generally more entrepreneurial in their cognitive processes:

I think yes that these new employees are more technology oriented, multitasking, has forced it. I don't know but it has happened. I guess I'm right on the edge of that, I can sort of do that but, my kids pick up on that much faster. And I see that with the younger people here. Those that are in their 20s. It is more,... they're more flexible, they are almost looking for the change, the next change they are use to it. They are used to evolving quickly.

The performance-oriented mindset is increasingly adroit, temporally agile, as well as technologically and multitasking savvy. The performance-oriented mindset appears to have an affinity for evolutionary sustainment. This simple yet deep insight emerged in a number of

subsequent interviews. These interviews gave distinct characteristic to the performance-oriented entrepreneurial mindset. With respect to the emerged theory, this confirmation provided theoretic saturation with respect to decision orientation.

P4: Increased entrepreneurial decision orientation positively influences the performance-oriented decision process

#### 4.2.1.2.2 Temporal Perspective

The analysis emerged temporal orientation as an element of mindset. There appeared a positive influence of past and future temporal inclination with respect to knowledge seeking, knowledge generation, and knowledge response. This inclination increases the amount of actionable knowledge generated to support a decision. This increase positively influences the probability that a performance-oriented decision will result in continuous value creation. Temporal orientation is the event horizon associated with a decision. Temporal oriented mindset is also willing to go cross-temporal in search of actionable knowledge.

One element of temporal orientation is long-term focus. From a sustainment perspective the respondents indicated that the bulk of the product-oriented sustainment decisions focused on which parts to repair, which vendors to perform those repairs, scheduling of overhaul, contract scheduling, buying, and addressing pressing reliability concerns. The objective was oriented toward return products to specification. The performance-oriented incentive and learning structure drives a mindset oriented toward continuous (long-term) value creation through innate expectation of cost and performance improvement. As stated by a government PBL manager:

I want to have a pen that works and what works for me is if you fix the pen so it never breaks.

The analogy is a good one. Performance-orientation generates a longer event horizon. The performance-oriented incentive structure generates a mindset oriented toward searching for solution sets that achieve long-term increased performance. If the potential reward is structured so “the pen never breaks again” market forces are likely to provide a never breaking pen. This requires a shift in the normative values associated with a product oriented compliance mindset:

You are going to need to switch things around and say okay, this may not be directly in the contract. But I will go do it even though it may cost me a little money, but over the long term there is benefit; you're thinking over the long term versus the short term.

The performance-oriented strategy focuses on the long run value creation. The long-term approach requires a decision not governed by the product-oriented contract. Instead decision is oriented to long-term increases in value for the network.

The analysis revealed the link between incentive structure and a dynamic decision. A product-oriented incentive structure rewards efficient repair and return. A performance-oriented structure is constantly iterating long-term rewards against investment decisions to improve performance:

Most of the time with supply chain management at the very top level they will feel comfortable with a performance-oriented strategy. If you give them a long-term view, we found our network member would invest capital their ahead of the performance improvement. So it would be a better next year.

Performance-oriented strategy adopts a temporal awareness (sense) surrounding the cued response solution set. From a methodological perspective the segment also infers that senior leadership has more of this long-term orientation, “at the very top level they will feel

comfortable with it.” Such dimension is an essential element in theoretical sampling and subsequent saturation.

The temporal orientation also evokes an inclination to search the past for possible solutions sets. The performance-oriented mindset is cognizant of and willing to act on the past. For instance in the following story the industry senior manager discusses how based upon experience the network is laying in potential capability regardless of the generated engineering analysis:

History tells us that although we designed it for X hours we may not reach that goal. We may at the end half of that time or so have to go through an upgrade. Or an overhaul which replaces some of the worn items. So we do not want to give up the ability to set up this capacity if it is needed.

The performance-oriented mindset attends to the tension between hard facts “designed for X hours” and historical knowledge awareness. The historical, cross-temporal, knowledge effect is so strong that it overcomes the hard facts. The decision maker consumes resources to protect against an empirically unsupported ability to generate needed capacity. In a performance-oriented strategy this makes a great deal of sense. Evolutionary performance requires a dynamic and efficient knowledge to value conversion process. The performance oriented manager posses unsurpassed ability to “mentally model” probabilities and outcomes based upon history experience.

The potential value associated with a temporal capture of current tacit knowledge for use (regeneration and dissemination) at some point in the future drove executives to rethink organizational structure. The performance-oriented process illuminated the value of knowledge-based resource generated during design and production. This realization manifested a desire to protect and preserve these resources for later value generation. The executive

interviews illuminated a desire to efficiently store those resources for harvest in sustainment. One senior executive described the need to reconceptualize organizational structure. The executive discussed creating a second dimension in organizational structure dealing with time. The approach considered not only the organization of today (development and production) but also how to most effectively evolve that organization to create continuous value in sustainment. This evolution entailed consideration, down to the employee name and skill of who should be where in the organization 5, 10, and 15 years out. The rationale is that core teams of those responsible for creating the system were most capable of storing and then harvesting tacit knowledge and skill based resources in support of evolutionary sustainment value.

This conception represented a striking comparison to the product-oriented organizational approach in the aerospace industry. In the product-oriented approach the contractor engineering expertise (knowledge and structure) shifted to new programs after design and production was complete. The lion share of sustainment then became the responsibility of the government. The knowledge generated and tacitly stored in the production design network represented a multi-billion dollars investment in knowledge and skill. This value largely evaporating as the aerospace network of firms turned to the next research, development, and production program.

The shift in performance-oriented executive mindset leads industry to intentionally capture and leverage tacit knowledge long into sustainment. This observation represents increased appreciation for temporal elements knowledge. This emergence saturated temporal perspective as an element of mindset. Bringing the tacit development knowledge based



resource into sustainment appears probable to result in exponential value creation in comparison to the previous product-oriented approaches.

The performance-oriented mindset adopts a temporal awareness. This awareness positively influences the probability that decisions adopt a long-term perspective as well as a willingness to go beyond the present and back into the past. A temporally adroit decision schema increases the probability of continuous value creation.

P5: Increased cross-temporal mindset positively influences the service-oriented decision process.

#### 4.2.1.2.3 Adaptive

The performance-oriented mindset is adaptive. This mindset looks for signals in the environment and acts on those signals to improve system-level performance. This mindset seeks continuous value creation. The interview and analysis frequently centered on behavior (decision) which sought to rationalize new knowledge and awareness of the environment in a way that continually adapted decisions today in a fashion superior to decision yesterday:

What I was telling my folks is the mindset has to change.

The performance-oriented mindset is adaptive; the dynamic outcome shaping a dynamic response structure. Conversely the product-oriented mindset focuses on a more static outcome; return the system to original specification. For the product-oriented mindset the response today is largely similar to the response yesterday. In contrast the performance-oriented mindset is cognizant of the dynamism inherent in the environment. The performance-oriented mindset senses and responds in an adaptive fashion. The mindset is oriented by a probability that knowledge tomorrow may afford a different decision and an improved outcome. This requires a mindset willing to understand change, adapt to those changes, and

make new decisions based upon new information. What worked in the past, may not work in the future.

You know that you gestalt it is not the pieces. So behavior is a major thing. Skill sets, cognitive focus if you will, is a major player from what I've seen. You know, a couple of things. If you are in an engineering house and this is an engineering house. The logisticians have always been a second-class citizen, because if they can get the part there on time, I can figure out how to design it. Access to the part after it gets to the field is not my problem. My focus is to get that plane out of the factory door and sold to the customer. So the focus has shifted with performance-based logistics and sustainment. But it will take a while.

The participant reveals the emerging structure. Behavior and skill are shifted in a new “cognitive focus”; a new mindset. The change to a performance-oriented approach pronounces the link between customer, evolution in customer value proposition and network ability to satiate that value proposition through product alone. The product-oriented answer to customer complaint is to “design something else.” The shifting roles and priority is confirmed in the slightly sarcastic comment that the logistics is inherently simple in comparison “if you can get the part there on time.” The reorientation to a performance-oriented mindset almost has an air of class struggle. This participant illuminates this struggle; the firm becomes more than engineering house; logisticians are no longer “second class citizens.” The element of change with a focus on understanding customer sense of sustainment value. The focus is shifting but the shift will “take a while.” These are key insights revealing structural changes as organizations adapt under the pressure of the new environment.

We need policy that promotes partnering. That promotes PBL. It is the senior leader level that they can be the change agents to take that story up. Some senior leaders are ready to push outside of the box. One has said to go find me a rate that is competitive to partnering... Those are the leaders we have talked about, those are the leaders that say hey things are changing the environment is changing we have to adapt.

The evolution to performance approach is moving forward, yet institutional factors have yet to adapt as indicated by “new policy is required.” The participant believes that the general officers understand this institutional shift, and now what remains is for the generals to “take the story up.” The segment reveals that adaptation is occurring, mindset is changing, yet the story needs to go “up.” Up to who? Is it the next general, the department of defense, congress? This segment reveals that the story is good, the organization most in contact with the changing environmental is adapting most rapidly. Now what is required is adaptation by the institutional level factors.

P6: increased adaptive mindset positively influences the service-oriented decision process.

#### 4.2.1.2.4 System Awareness

The dynamism of the performance-oriented approach achieves value by optimizing discrete decisions against network level optimization. In performance-oriented strategy, mindsets that maintain system level awareness increases the probability of continuous value creation. The performance strategy drives a shift in mindset where knowledge of the whole system ensures optimization of the parts:

It is the weapon system that should be the purpose. One of the things that was the big challenge outside the ZZZ weapon system family, was that you would tell people that you are willing to compromise, they would not believe you because they didn't have trust, but inside the ZZZ weapon system family. They would say great let's go do it we all believed you.

The essence of network optimization is a mindset that senses and responds with an awareness of the impact the decision has on the overall system. Mindset oriented toward system level awareness endogenously generates trust. More trust increases the probability that a decision will be more network optimal. By recursive logic increased network optimal decision positively

influences continuous value creation for the network partners. If the performance-oriented incentive structure is correctly aligned, continuous value creation reinforces “trust” based decisions. As such trust is not simply a normative societal value as inferred by the “family” reference. Instead the construct “trust” emerges as a performance-oriented network condition that leads to increased value for the network actors.

The system level awareness improves the efficiency of decision-making. Lower level decisions made with awareness of “the bigger picture” drives a synergized effect that increases aggregate level outcome:

Flight controls are a good example. There are many things in the flight control system that can affect one and another. So look at it as system making it all work. That is what we are trying to do right now. So the day-to-day....The vision is that we have an information system that all of these stakeholders tap into.

There is a link between sub system performance and system level performance. The segment demonstrates the vision for an “information systems that all these stakeholders tap into.”

Vision is inherently future oriented; the systems do not exist now but are required in a performance-oriented future. These information systems are required to ensure a system level awareness in decision-making.

The shift to the performance-oriented mindset requires a change in individual thinking at an abstract level. The shift requires proactive action by the network leadership to reinforce such a system optimized mindset:

And you have to change the culture. The behavior that you are dealing with, you know the culture, the behavior of leadership and so forth. So you have to have the right skill sets, you have to have the right type of thinking.

The structural shift in a performance-oriented environment requires new thinking “the right type of thinking.” This interview segment links the change in thinking as a change in behavior

and a new type of culture. Leadership influences the shift to the “right type of thinking” and the “right skill sets.” The system level awareness, coupled with performance-oriented incentives closes the loop through a sustainment “business cycle”:

And now we get into common themes. All this rambling has some meat in there. So your business decision cycle, and you're performance incentives, and you're performance outcomes have to be aligned. So if you can align those three things, your chances of success are multiplied immensely. So your decision cycles, and what you reinforce, and what you are trying to achieve are all aligned with an output type of metric. As opposed to some of these sub metrics, the transactional ones. Then you can optimize toward the end result that you really no kidding want.

The “business decision cycle” ties together knowledge generation, dissemination, and decision response process. The business decision cycle of performance logistics involves aligning performance incentive and performance outcome. Alignment increases the probability of success “immensely.” Network optimal occurs by aligning the decision cycles, reinforced incentive, and identifiable network level performance outcome.

P7: Increased network level aware mindset positively influences the performance-oriented decision process.

The performance oriented decision process, composed of knowledge management and performance-oriented mindset emerged as the central process in a performance-oriented theory of sustainment. This process, like all processes, results in conversion. Conversion occurs through decision. The performance-oriented entity engages in a decision process that senses superior opportunity today and responds in a manner that generates greater value than the response yesterday. The performance-oriented mindset of the entities influences this process. Like any other process, this process has structural antecedents that largely shape the dynamics

associated with the particular performance-oriented network. The next section of the analysis presents these antecedents.

#### 4.2.2 Antecedents of a Performance-Orientation

Integration, environment, leadership, partnering dynamics, and information systems

The performance-oriented decision process construct is composed of knowledge management and the performance-oriented mindset. The antecedents of this process emerged as inter-organizational factors that affect the ability of any particular performance-oriented network to generate continuous value creation through that process. The analysis generated five distinct antecedent categories. These categories are integration, environment, organizational leadership, partnering dynamics, and information systems.

Figure 7  
Antecedents of the performance-oriented theory

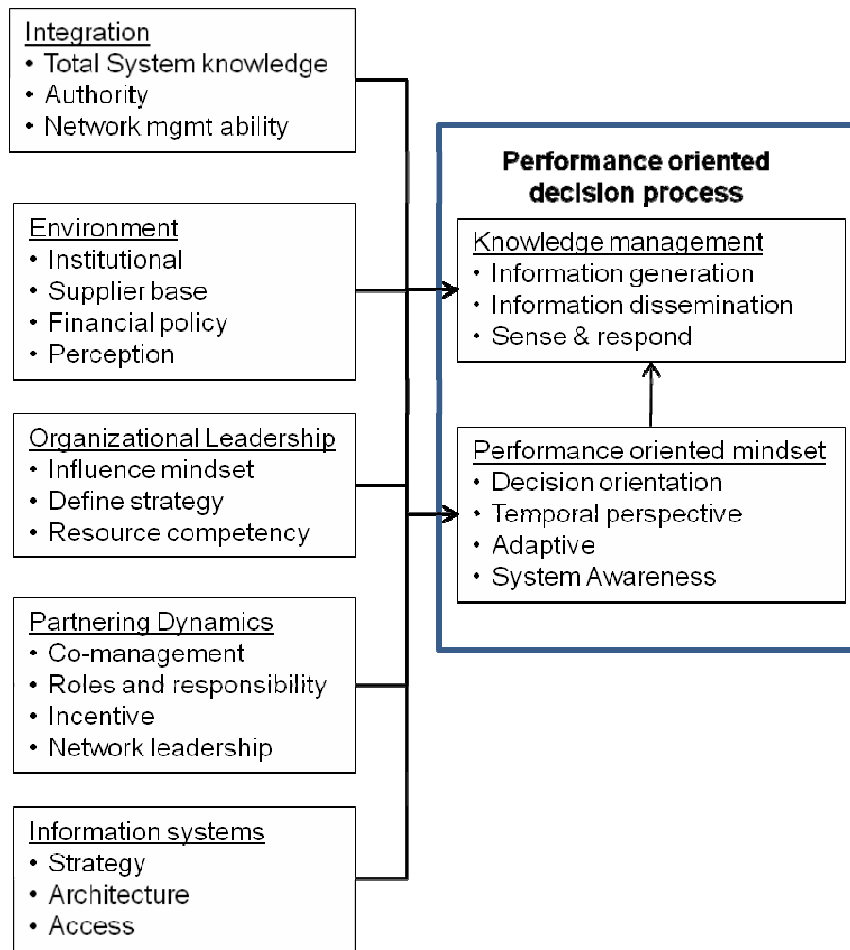
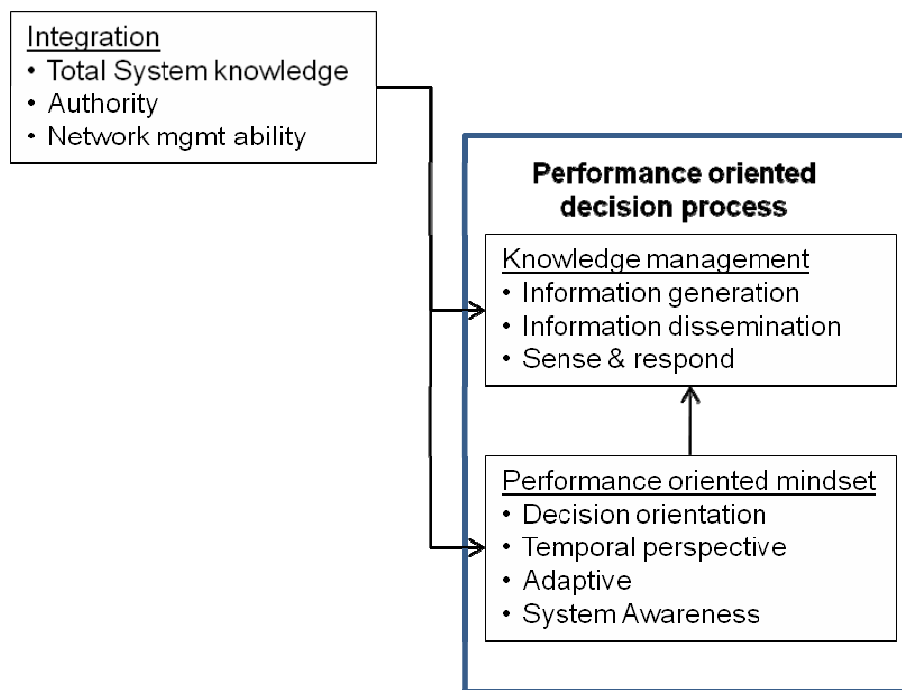


Figure 7 graphically represents how these antecedents relate to the performance-oriented decision process. Industry executives who reviewed (member checking) the antecedents and relationships concurred with the content of the categories and the theoretic relationships between these categories. The executives indicated that these categories, arranged as shown in figure five, provided new and actionable insight into the structure of a performance-oriented logistics strategy. They expressed the opinion that this framework allowed insight into how to more efficiently influence outcome. The discussion of the antecedents begins with the category integration.

#### 4.2.2.1 Integration (Authority, Total System Knowledge, Network Management Ability)

The grounded theory analysis revealed that integration influenced the performance-oriented decision process. This section presents the overall category of integration, and then the discrete element of integration and their influence on the performance-oriented decision process.

Figure 8  
The Role of Integration



During the analysis a group of senior aerospace sustainment managers critiqued an initial draft of the emerging framework. One of the participants, a senior engineer, sat back quietly for some time and then stated, “you’re missing something here. You’re missing how all this comes together, how it is integrated.” This was a tremendous insight. That insight captured a seminal aspect of the how and the why of the emerging theory. That meeting resulted in the



creation of the integration code. Follow-on interviews and analysis saturated the integration category by exploring questions such as what is the role of integration, who should perform integration, why, and what integration required.

So how do we take the industrial base that we have and see how that fits into our global supply chain system that we are putting together? And that is really what I am looking at, it is putting that, I always use the term business wrapper around our supply chain. Because we are selling a service ultimately. Not parts. You know we are in it to make a profit, but also bring a reduced cost for sustainment to the government.

The integrator puts the “business wrapper” around the sustainment-oriented service. The business wrapper function is performed by an entity that can integrate the parts “putting together” and see the whole “our global supply chain.” The global supply base, the network is integrated to provide a “service, not parts.”

The various performance-oriented programs all had a defined role for an integrator. In some cases the integrator was the government, and indeed there is a community who pushes for a government integrator. In other cases the integrator is the prime contractor, the firm who originally designed the network that produced the system. Who should perform the integration function generated a great deal of discussion, some of which was sensitive. The following passage highlights the tension associated with this topic.

The role of integration?... It is really the functional aspect of managing those relationships. You have to make sure the right knowledge is getting to the right place, at the right time. Making sure that all of the actors and players that need the information have it. Understanding what is driving that activity, and what impacts the activity will have over the long term. Part of achieving the performance requirement is making sure all understand the requirements.

Interviewer: Do you think there is a requirement for whoever does the integration role to set standards or to try to at least come up with the architecture for this constellation, this network of information?

Oh absolutely! Yes they have to at some point define what that total architecture is.

Interviewer: Who should be the primary system integrator?

That is a good debate.

Interviewer: okay who do you think it should be?

I am coming from an industry perspective. Classically industry does that somewhat better. From that perspective. However....however that really is an open debate.

Interviewer: Is it a sensitive debate?

It can be. You will have both camps. Some will say let the government do it. Some will say let the contracting authority do it. Some would say let the operating commands do it, well the operating commands do not do it. Some would say the logistics commands. Some would say let Office of the Secretary of Defense do it. Some would say let industry do it. Classically industry can probably do it a little cheaper. However industry has a track record at times where they have not performed.

The emergence of a performance-oriented approach generates a requirement for network integration. All agree that the integration function is essential. Who should perform that function is a “sensitive” discussion. The grounded theory emerged the elements of integration in a positive fashion with normative implications. The analysis reveals integration attributes. The integrator is logically the entity that possesses those attributes. The following sections describe the general elements that define that positive model. The normative implication is to select an entity most capable of performing the integration tasks in a manner that achieves greatest continuous value creation. The analysis revealed the elements associated with integration as authority, total system knowledge, and ability to manage the network.

#### 4.2.2.1.1 Integration (Total System Knowledge)

The first element of integration is total system knowledge. The analysis indicated that optimized output requires a system level awareness. The performance oriented mindset provides an inclination to sense and respond based upon a network optimized decision framework. This mindset requires a network level sense of the what impact discrete decisions will have upon continuous value creation. Ensuring this network optimized sense is the requirement of the integrator. Integration links discrete decision with impact on the aggregate level performance:

What we saw was some areas where processes were convoluted... parts that required a unique handling were being handled by an agency that was familiar with that unique handling. The parts were being handled by parties who, because of the nature of the materials and processes were not well equipped to deal with them.... We brought a different approach to these materials solutions... We (the original designer) were used to dealing with these materials... And by forming a direct relationship with the customer we could help them with their material needs, anticipate their demand patterns, and help them with their stock its levels. We could provide them with an increasing level of support, at what was decreasing cost. So we saw an opportunity.

Network optimization requires efficient integration of disaggregate processes. Network level awareness improves the efficiency of the supply chain management. There is a link between the integrator's aggregate level awareness with the ability to "help them with" an ability to sense and respond in a manner that increases supply chain management efficiency. The system level knowledge increases the probability that the integrator, and network members, will "see an opportunity" or sense and respond in a network-optimized fashion.

System level knowledge positively influences the effect of the integration function. In turn integration positively influences the performance-oriented decision process. This occurs when the entity responsible for performing the integration role is able to increase the

probability that network members execute decisions with an increased system level awareness. This system level awareness suggests technical knowledge of the system, knowledge of stakeholders associated with the system, and ability to efficiently infuse knowledge of new sources of value. Knowledge of the stakeholders includes customers, focal firm, manufacturers, suppliers, users, bill payers, and institutional entities:

Really if you're looking to reduce, or control costs for that matter (the overall goal in PBL). And the predominate cost is in repair. You can do it one of two or three ways. Either find a lower cost repair source in terms of labor rates. You find a way to improve the reliability of that part. Or you improve the repair process.

The technical system level knowledge generated and disseminated to the entity authorized to make a repair and reliability decision positively influences the probability that the result of that decision will bring continuous value creation. The segment reveals that in a performance-oriented sustainment program there are only three processes to improve performance and generate continuous value. These processes are increase reliability, improve repair procedures, and improve supply chain management. Each of these processes require decision structures with access to network wide actionable system knowledge. Two of these (improve reliability and improve repair) requires some level of engineering authority on behalf of the original equipment manufacturer.

The integrator enhances the ability of the network to improve reliability and repair procedures through focused application of system level knowledge. In turn, these improvements influence continuous value creation. The integrator couples engineering authority with system level knowledge to ensure the airworthiness of procedure and performance changes.

The ability to accomplish reliability and repair improvements (and generate greater value) requires knowledge of the system performance (in particular system failure or repair process efficiency) coupled with an ability to identify root cause and contributing context (i.e., time of failure, pedigree of the part, interaction of components). During the interviews participants described stories how tertiary systems performing inefficiently, for instance cooling, induced failures on other parts. Without the system level knowledge the root cause (cooling) remains unaddressed:

We have a number of complex issues, diminishing manufacturing source and material related challenges in all of that. You (the integrator) would have to see that, I would be skeptical that someone who hadn't demonstrated a significant body of experience could suddenly come in and say I will be the integrator. Okay show me.

The decision with the greatest probability of positive nonlinear effect requires complex system level knowledge. The ability of the integrator to provide total system awareness, to include customer sense of value, increases the sense and response effectiveness of the performance-oriented decision process. This increased effectiveness positively influences the probability of continuous value creation.

P8<sub>a</sub> Increase network level awareness positively influences the performance-oriented decision process.

P8<sub>b</sub> Increase in the performance-oriented mindset positively influences the effects of network level awareness.

#### 4.2.2.1.1 Integration (Authority)

Performance-orientation requires decentralization of authority in support of flexible response. Integration requires authority to act and implement cross network policies and decisions to optimize the performance outcome. Both government and industry research participants described how integration required authority to generate and implement decisions

in a timely and efficient manner. The analysis generated a number of codes dealing with authority. Some segments mentioned responsibility, others accountability, others authority. Overall authority appeared most effective capturing the overall context of this element of integration. Integrator authority entails:

1. Financial authority (or its delegation) to enable decision response
2. Accountability authority to apply incentive in response to entity impact on continuous value creation
3. Engineering authority (or its delegation) to improve reliability, maintainability, and repair enhancements
4. Resourcing authority (or its delegation) to ensure the network infra-structure
5. Partnering authority (or its delegation) to ensure the selection and maintenance of partner relationships
6. Investment authority to ensure desired performance outcome
7. Information release authority (or its delegation) to ensure greater probability the network will generate a more optimal solution

Integration requires authority to generate a structure that aligns decisions with the performance goal. Integrator authority is required to reinforce a shift away from compliance oriented (authority) enforcement, to a more trust-based entrepreneurial (authority) empowerment. The network optimized goal forms the governance mechanism that guides entrepreneurial authority toward continuous value creation. The shift from product to performance requires authority-restructuring effort aimed at increasing the probability of performance-oriented success:

The problem we have, if you really want to have a performance-based logistics, if I want you to maintain my weapon system, I am going to have to give you some authority.

The government in a performance-oriented approach gives the integrator “some authority.”

The segment illuminates the tension in the shift from product to performance; giving away some authority is “a problem.” For this respondent releasing some authority makes sense, yet

that does not occur. The retained product-oriented institutional level policy and guidance reinforces the compliance-oriented strategy of the previous paradigm.

The analysis revealed that the tension although manifested at the individual level is in fact generated as leading edge entities sense and respond to the environmental shift quicker than the more removed institutional entities. At the individual level the product and performance paradigms collide. This collision first occurs between entities at the leading edge of a performance-oriented strategy (very tactical) and an institutional entity responsible for some broad ranging policy. The tactical entity is in direct contact with the shifting environment. This entity sees the clear potential of the performance-oriented strategy and the constraint of the policy. The institutional entity is at a much higher level, responsible for policy that affects a broad range of programs very few of which are at the edge of PBL. For these institutional entities the shift in the environment is abstract at best. The conflicting perspectives generate tension.

The product and performance paradigms are inherently incommensurable. The collision generates *predictable* tensions. The organization most in contact with the shifting environment more quickly adopts a performance oriented mindset and the new worldview. The tension has an air of inter-personal conflict. However the tension is in fact environmentally driven. Each entity is striving to do their job. Their jobs are simply incommensurable:

I (the government) will have to give you (the contractor) some authority. To order spares, or to determine what the correct right spare levels are. Most of the performance-based logistics, I'm sorry the contracts we have with performance based elements. Because I would be mischaracterizing these contracts if I called them true PBL contracts. They have PBL elements. But we haven't come out fundamentally with a PBL contract, we do not have authority or the money to buy the number of parts we think we need, or to do smart things. For instance

we (on this particular program) can't go out and make lifetime buy. Every time we want a part, if a part breaks, we have to go back and get permission.

As the differing world views collide the tactical level performance-oriented entity becomes frustrated. The tension erodes the necessary partnering efficiencies to harness performance-oriented success. The tactical level entity sees the requirement and impact of timely execution in a PBL environment. The performance paradigm requires timely response and delegated authority, not having to “go back” and get permission. The product-oriented strategy adopts a return specification approach. The focus is built upon an assumption of efficiency in a static processual response structure. The interview segment indicates that this program has only “PBL elements.” The respondent’s inference is that this program’s evolution to a performance strategy is nascent at best. The tension and frustration between the tactical level entity and their more removed product-oriented counterpart is entirely predictable. The closer the entity is to the shift in the environment the greater the recognition of the requirement to delegate authority. This confluence becomes a paradox; those who have the authority to delegate are more removed from the shift. The normative implication is that some entity must act in a nonlinear fashion to hasten the conversion of institutional actors removed from the environment.

Institutional level policies impacted the ability to delegate authority. These policies impacted decisions on source of repair and ability to incentivize depot level work forces. Other institutional constraints dealt with historical roles of government agencies such as the Defense Logistics Agency (DLA) and the Defense Finance and Accounting Service (DFAS). For instance, DLA is historically given authority to manage DoD wide piece parts. DLA has a large investment and historical path dependencies associated with this function. The optimization of piece parts



can sometimes sub optimize the system performance outcome. The integrator requires system level authority to ensure performance-oriented strategy works in an optimal fashion.

In some environments only the government has the required authority and ability to align the entire performance network. As the achievement of system optimal performance relies on a preponderance of government agencies, the balance of authority and accountable tends to favor a central government agency as integrator. Current institutional policy constrains industry integration on programs that rely on significant government agency support. Pending a shift in policy, government integration on these programs remains the more realist approach.

In general the arguments of who should perform integration are coherent. The integrator must have authority to hold the network partners accountable for their discrete decisions and corresponding impact on the customer value metric:

So, of course the risk flows down with the metric. But we wouldn't just get pay a dollar per flying hour, we would be pay a dollar per usage that is surrounded by a certain number of performance metrics that the supplier has to comply with. It is almost a pass through down to that subsystem. But we hold them responsible for looking at it always from an enterprise perspective.

Integration requires authority to "hold them responsible." Learning in a performance-oriented strategy requires clear explication of entity impact on continuous value creation. This requires integrator authority to decompose metrics and assign incentives. Integration entails the ability and the authority to flow down performance requirements, reward achievements of those requirements, and optimize efforts toward network level objectives.

Authority is a key attribute of integration. Product-oriented authority is delegated through contracts, memorandums of understanding, and policies. The use of preplanned structures, constrained response, and limits on adaptable roles and responsibility appears

antithetical to the flexibility required by performance-oriented strategy. Performance-oriented integration authority (or its delegation) is structured to support dynamic decisions.

Subsequent member checking supported the proscription implications of authority delegation. Executives of leading edge programs agreed the network level authority is required by the integrator to harmonize product and performance partnerships. The executives felt that the performance-oriented strategy is a “good story”; one that would be well received if articulated properly. The executive saw a need to close the gap between environmentally removed policy which limits delegation of authority and performance-oriented success. Closing this gap requires reinterpretation of law and policy to support more coherent authority execution. Effective performance-oriented integration requires assignment of the integration function to the most capable entity and giving that entity authority over government and commercial partners.

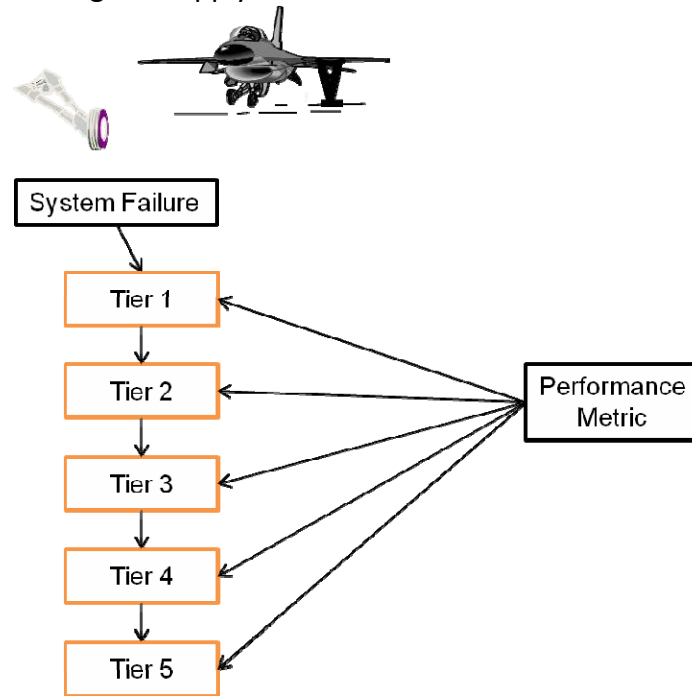
P9<sub>a</sub> increased integrator authority positively influences the performance-oriented decision process.

P9<sub>b</sub> Increase in the service oriented mindset positive influences the effects of integration authority.

#### 4.2.2.1.2 Integration (Network Management Ability)

Integration in a performance-oriented strategy aligns the network toward the aggregate level performance goal. The integration function requires knowledge, authority, and ability to focus the network on the performance goal. Network management ability is a key factor associated with decomposing performance outcome metric and translating that performance outcome to the appropriate actor. Performance-oriented network learning is achieved when the integrator rotates the tiers of supply chain to focus network wide activities on the desired performance, Figure 9 illustrates this concept.

Figure 9  
Rotating the Supply Chain from Product to Performance



In the product oriented approach failure experienced by the customer passes to the first tier entity. The first tier entity passes that failure back through to the system (tier 2) and then the subsystem level (tier 3). Generally the failed component goes back through the supply chain to a vender who returns the component to original specification. The vendor then puts the component back into inventory. Unless there is a significant performance degradation associated with the component, i.e., the component is significantly underperforming with respect to specification; the process does not address the failure mode. The interview did not generate an instance where an individual discussed a program (in the product-oriented approach) aimed at increasing reliability on a part beyond the original specification. The part is repaired, the failed piece parts simply replaced.

The repair process of the component reveals an important insight. The failed component requires replacement of a piece part. In comparison with the system wide cost

associated with the failure, piece part redesign may represent substantial wealth. Seldom was this individual piece part implication with respect to the total weapon system performance captured:

What I mean by that is that, prior you were in the same transactional relationship with the supplier that customer is with the focal firm. So when I go lower down the chain it's okay theirs part is breaking, so therefore I am actually, you know, having to pay more. Which I just pass on to my customer. Now what I have to do is say okay suppliers, if you can find improvements I am giving you this incentive. If you put improvements back into the system that helps our end customer, then what that does is allows us to manage that relationship so that even if I am not paying for an upgrade in performance I am still getting an upgrade in quality of the product, and reliability etc (performance improvement). So then I can pass it on through, helped out by the long-term contract and the long-term relationship being maintained or improved as you go forward.

The “previous” product based structure is transactional. In that environment the repair is sent back “down the chain” to the tier 3 or 4 supplier and cost is simply “passed back to the customer.” In the performance-oriented approach the integrator “says okay guys if you can find improvements” I will reward you. The system level awareness provides the integration function the ability to rotate the supply chain and more effectively and proactively manage the network.

The integration role focuses discrete activities well back in the supply chain through a “relationship” with the end customer based upon rewarding achievement of the value metric:

Yes that's it that's exactly what I'm saying getting those processes aligned those peoples aligned with it. Now their metrics are tied to the aircraft. Not to the aircraft ground equipment shop.

Integration requires an ability to manage the network in such a way that the appropriate supply chain member regardless of their tier focuses on how their decision affects system level

performance as represented by the co-managed customer value metric. Integration leverages knowledge generated and disseminated across the tiers of the supply chain to focus on continuous value creation. The performance-oriented strategy creates value when the tier 5 piece part provider informs the tier 3 repairing vender about a “new more temperature” resistant piece part. With integrator engineering approval the decision to incorporate the new piece part creates new value:

You say does this match what you're trying to achieve, does this align to it. Does what you are measuring here align to what you are trying to achieve.

Integration rationalizes decisions at each level of the supply chain with aggregate system level performance.

Overall integration requires an ability to manage the entire network. Integration requires an entity that can generate interest and attention from third, fourth, and fifth tier suppliers and focus that attention on performance outcomes. Integration requires an integrator who can reach across the network to manage various functional groups. Integration requires proactive management ability. The integrator invites suppliers who show up and tackle “hard problems.” The integrator co-manages creation of the customer value metric and subsequent decomposition of that value metric to align network activities toward continuous value creation.

P10<sub>a</sub> increased integrator network management ability positively influences the performance-oriented decision process.

P10<sub>b</sub> Increase in the performance-oriented mindset positive influences the effects of integrator network management ability.

The elements of integration emerged as authority, system knowledge, and the ability to manage the network. From a proscriptive perspective the integrator should be the entity most

capable of performing these roles within the constraints of the current environment. The integrator by garnering support for a value metric and its decomposition takes the place of the price mechanism in focusing resources on value creation. The integrator acts more efficiently than the market, decomposing customer perception of value, and assigning / rewarding the discrete knowledge based decision transactions of the network entities in a manner that impact continuous value creation. This decomposition and reward assignment provides the learning. In this function the integrator does away with classic approaches to quality management. The efficiency of the integrator is captured theoretically as:

$$KC_{st} = \frac{(\sum_{t=1}^m \alpha_t V_t) / \Pi}{(\sum_{t=1}^n \beta_t R_t) / \Pi}$$

*KC<sub>st</sub> – the knowledge conversion efficiency of the decision > 1*

*$\sum_{t=1}^m V_t$  = the perceived value created by the decision*

*$\sum_{t=1}^n R_t$  = perceived resources consumed by the decision*

*m = unit of time the value is created*

*n = unit of time resources are consumed*

*$\alpha_t$  = some coefficient of increased network efficiency through integration*

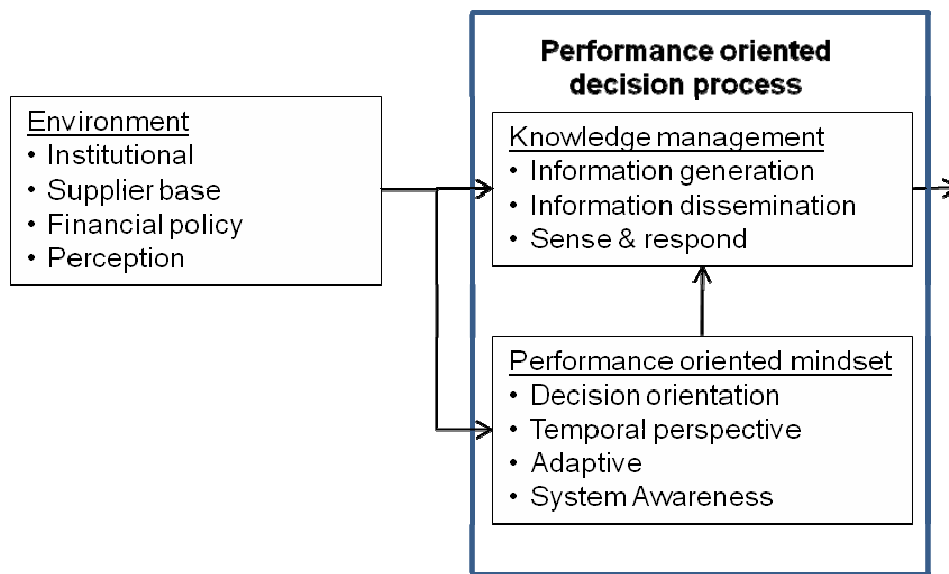
*$\beta_t$  = some coefficient of resource burden of the integration function*

The integrator acquires and disseminates network level knowledge in an actionable form. The mindset of the decision maker influences how the decision maker will act upon that knowledge. The integrator focuses on network optimized continuous value. The next antecedent addresses how extra-network environmental factors affect the performance-oriented decision process.

#### 4.2.2.2 Environment (Institutional, Supplier Base, Financial Policy, Perception)

The grounded theory emerged environment as an antecedent of the performance-oriented decision process. Analysis emerged four distinct sub-categories of environmental factors that externally impact the network's ability to generate value-focused decisions. These elements are institutional, partner base, funding, and perception. Each of these subcategories in some way influenced decision, or the performance-oriented mindset. Environment is the macro level influences beyond the purview of the specific program network. The first subcategory is institutional factors.

Figure 10  
The Role of Environment



##### 4.2.2.2.1 Environment (Institutional)

Institutional factors emerged as a significant influence on the performance-oriented decision process. The institutional factors improve society at the macro-marketing level at the network level decision constraint has a negative impact on continuous value creation. For instance public law requires 50 percent of DoD sustainment expenditure go to military depots.

The law ensures that the US has sufficient military specific infrastructure in the event of large-scale conflict. From the network perspective this requirement constrains source of repair. The assumption is that the macro good outweighs the micro inefficiency.

Institutional factors ensure security, environmental protection, workplace safety and more. The analysis revealed a great deal of focus by the participants on institutional factors. This concern gave dimension to institution as an element of environment. The participants indicated that certain institution factors, such as law with respect to DoD financial flexibility, DoD contract length, depot work load sharing, and numerous legal interpretations require re-evaluation in relation to performance-oriented strategy implementation.

For instance, one program manager wanted to reinvest performance based savings generated by a depot workforce as an incentive for that workforce. The incentive in this case aimed to purchase more effective test equipment. The test equipment purchase was intended to generate future savings. However legal interpretation resulted in a denial of the incentive strategy. In another case the integrator wanted to use some of the savings to provide tangible incentive to depot workforce such as a bonus or a refrigerator. In both cases the stakeholders associated with the incentive decision believed that the use of the incentive generated greater long-term value for the taxpayer. However, legal interpretation (environmental factor, institutional constraint) determined that Federal Acquisition Regulations (FAR) did not allow the use of working capital funds (funds set in a revolving account specifically designated for repair) to be used for incentive:

Our monetary remedies (award fee) had to be taken out,... because of working capital fund issues, and right now the regulations, the FAR, and statute say the working capital fund cannot be used as incentive. Working capital fund has to be a revolving fund, it cannot be added to or taken from.... I was trying to provide



money to (the DoD repair facility) for excellent performance, but that would be giving them money for what the lawyers say is “no real work done.” So you’re not getting any kind of product even though we could justify it by saying we get increased performance. They don’t see it that way. What they think is that we need to go to Congress or OSD and get that changed or get a waiver for that particular regulation in order to be able to properly incentivize the contract. So that will be next year.

The product orientation of the policy is demonstrate by the statement, because we are “not getting any kind of product even though we could justify it by saying we get increased performance.” This interview segment outlines a strategy developed by the organization adapting to the performance-oriented environment (award fee concept). The segment highlights how institutional factors constrained implementation of the desired strategy. The finding that “no real work done” illuminates the cost based focus of the product-oriented regulation. From a performance-oriented view incentive makes intuitive sense. Yet the “regulation waiver” will come later and thus delays implementation of the performance-oriented strategy as policy adapts at an understandably slower pace. Policy makers are more removed from the changing environmental forces.

Another institutional constraint dealt with financial flexibility. Financial flexibility is the ability to redirect funds in a manner which leads to more efficient response:

We were able to say if we are able to consolidate our funding we may be able to get rid of ineffective spend completely.

Ineffective spend is knowingly spending in a sub optimized fashion due to institutional constraints. Law requires taxpayer dollars be spent in accordance with preplanned authorization. This makes a great deal of sense in a product base mentality. Yet such adherence to preplanned objectives negatively impacts dynamic decisions required to achieve continuous value creation in a performance-oriented strategy.

Another constraint dealt with the depot work share policy. Some programs indicated that constraints in repair sourcing reduced network optimal solution sets. The institutional constraints restrict the ability to treat the depot support providers in a similar fashion as an industry support provider. This constraint negatively impact the market based learning likely to occur in the depot organizations.

The engine of performance-oriented strategy is the conversion of knowledge to value through market place learning. This learning occurs by decomposing an aggregate value metric and then incentivizing partner behavior based upon their impact on that value metric. Constraints that limit the network management ability to incentivize or hold accountable a government partner runs counter to network optimal performance-oriented strategy:

“It's easier to put that saddle on a contractor than it is a depot”

In a performance-oriented environment the “saddle” is the incentive. The metric “saddle” uses market dynamics (profit) to link discrete decision with impact on the value metric. The inference United States code is not congruent with the immense potential taxpayer value proposition associate with performance-oriented strategy. Until policy is harmonized to support performance incentive structure the achievement of metrics based continuous value creation remains more rational in an industry partnership:

Interviewer: What will keep performance based strategy from working?

What is going to keep this from working, or delay a performance strategy? The things that can keep performance based strategy from working well? The biggest thing is keeping the old paradigms in place. As far as in the repair infrastructure. The depots are a major aspect of that.

The collision of performance and product strategies manifest themselves in many and disparate fashions. The analysis emerged a sense of frustration integrating the depot infrastructure into a

performance-oriented network. As the two paradigms come in contact the incommensurable incentive structure leads to understandable frustration without solution at the tactical level.

Each entity is in fact performing satisfactorily within their paradigm. The expectation that these incommensurable strategies can self assimilate is not rational. Product and performance-orientation amalgamation is inherently non-sustainable and entropic. The resources required to sustain and stabilize such volatile concoction are at best inefficiently exhausted. The more rational resource use is to convert the government infrastructure, policy, training, and law to support the performance-oriented approach. This policy conversion will increase the probability that the government/industry union will become a self-sustaining partnership, each entity contributing to the optimized network value proposition:

I think you should be able to incentivize a government depot. You need to be able to incentivize them monetarily like you do a contractor because what you are asking them to do is to go out and investigate parts to increase reliability. So if you don't have incentives that won't happen. What you want to do is the depot takes that money for excellent performance and you want them to reinvest it into your weapon system. And unless they get that extra money it's going to be business as usual where they have to get your requisitions along with the rest of the requisitions and bring things back to specification.

Now whether the depot mindset could change to go out and do additional technical investigation or capital investments. I don't know ... But that's what our contractors are doing and we assume, and the assumption is that if the depot is going to be competing directly with the contractors then they will have to be able to do the same thing under PBL. Without that incentive-reinvestment then you don't have the ability to go out and compete like that.

Correctly structured performance-oriented strategy generates market based endogenous learning. The achievement of dynamic value propositions requires reconceptualization of institutional policy. For instance the performance-oriented private/public partnerships require an ability to provide government depots an incentive and allow flexible reinvestment of that

incentive to generate continuous value creation. The research participant in the above text effectively links increased reliability and continuous value creation with incentive. Then the participant articulates the relationship between incentive and decision to invest, and how this has direct impact on continuous value creation. The participant infers causality between incentive and mindset change. The inference is that the performance-oriented incentive has already generated an industry mindset change. The question in the first line of the second paragraph is illuminating, “whether organic mindset could change? ”. The participant reveals the tension and mistrust associate with the forced union of the product and performance-oriented strategies. This participant has made the shift to the performance oriented mindset and is experiencing frustration as two paradigms attempt to coexist. For the network leadership the rational question is why would the organic mindset not change. If incentive through a decomposable metric is the key that unlocks the wealth of a performance-oriented approach than there can be no rational “special organic case” where that key does not work. The institutionally driven discordant product and performance comingling creates tension. At the tactical level the coexisting entities have few options to resolve this tension; network and institutional leadership intervention is required.

The analysis revealed that the performance-oriented network leaders seek effective bridging methods to incorporate parts of the previous product infrastructure into a performance network. One program lobbied and received institutional support to leverage the highly skilled touch labor resident in the government depots, while maintaining engineering involvement of key suppliers. This strategy generated a superior value proposition by

effectively leveraging the core competencies of individual network partners; the right task accomplished by the right entity.

Theoretically the government-industry partnership is structurally sound. It appears improbable that an open market entity could provide a value proposition superior to a similarly incentivized and focused government sustainment entity. The government entity is in a superior resource position with respect to capitalized infrastructure, tax liabilities, and a host of other market place burdens:

The (particular leader) wants the relationships between the products support integrators and all the products support providers (both industry and government) to be as closely comparable as possible. Because he wants to be able to take what the depot does and say 'look how much better we do against a contractor'. ...If the contractors are going to metrics then he believes he must go to metrics as well in order to show that comparison.

The institutional actor referred to in this interview segment is evolving the government workforce to a performance-oriented approach. This actor supports restructuring institutional policy and mindset to compete successfully in a performance-oriented environment.

The analysis revealed tension as performance and product paradigms collided. The analysis demonstrated that institutional factors tend to lag the adaptations required by those at the leading edges of the performance-oriented shift. Overall the analysis saturated institution category as a significant factors influencing the network ability to provide continuous value creation. Those interviewed indicated growing realization that it is near time to reconsider the product based law, policy, and guidance in light of a desired shift to a performance-oriented environment.

P11<sub>a</sub> Increased institutional constraint decreases the effectiveness of performance-oriented decision process

P11<sub>b</sub> Increase in the service-oriented mindset mitigates the impact of institutional constraints

#### 4.2.2.2.2 Environment (Financial Policy)

Flexible financial policy positively influences the performance-oriented decision process. Removing constraints generates increased decision choices and therefore increases the ability to generate continuous value creation. The ability to act upon the entire funding stream reduces risk and leverages long run optimal solution. The participants gave examples of how optimal decisions were constrained by limits on financial flexibility.

The research revealed a conflict between cost and price orientation. Government fiduciary responsibility focuses on cost structures. Contractual oversight, requirements of Federal Acquisition Regulations, and historical roles played by government entities in a product-oriented mindset lead to a cost-oriented philosophy on government sustainment programs. The enculturation of product-oriented entities emphasize a fiduciary respect for cost. Alternatively the performance-oriented entities emphasize a value-based accountability. The shift to performance strategy requires reconceptualization of fiduciary responsibility.

The performance-oriented strategist seeks the structure that will generate the greatest value proposition. For these strategists the network optimal provides ever improve price and performance propositions for the taxpayer. The performance strategy does not do away with cost instead the performance strategy subsumes cost as an element of process control in search of greater value. The integrator requires knowledge of current cost and impact of decisions on future cost. The performance metric drives cost accounting as a means from which to measure value generation efficiency. However, cost accounting is not the end measure of

value creation. This is a fundamental mindset shift that requires regulatory support.

Performance-oriented programs shift toward value and price; that shift subsumes cost.

The cost versus price paradigm can be illuminated by examining the underlying rationale for policy limits on multi-year contracts for a performance-oriented strategy. In a performance environment the multi-year funding increases integrator ability to generate cost and performance improvements:

The relationship really forms in the multi-year contract. When they move toward something that says this is something we want or don't want for five years, that we are going to lock down for five years. We're going to invest the time to put in five year priced options. The team that's working that right now is saying 'well I don't know if I want to do that'. 'That's a lot of work'. The contractor, when you do that, knows that if you do that you're serious. And then the contractor already knows they can look years in advance and they go 'if we are going to invest, and this is how much money we have'. And corporately they start investing in solutions. Industry does not have one year money, their money doesn't operate that way, they have more flexibility.

Stakeholders (suppliers, focal firm, etc) make investments today with the promise of harvesting generated savings as profit for an agreed to period of time. Constraints that lead to uncertainty "I don't know if I want to do that" reduce the amount of network investment in performance improvements. Corporate fiduciary responsibility requires investments made by the firm rationalize the risk and return. Increased risk results in an increase on the discount rate that the firm applies to future returns. More concrete return "years in advance" impacts "corporate investment", and "decision to invest." But for all other factors any uncertainty in contractual terms with respect to outyear return requires increase in the discount rate associated with that return in order to satisfy stakeholder interests. That is the network investor are less likely to invest in performance improvements as risk associated with customer reward of those improvements increases. Merely shifting from a multiple year to a multi-year contract increases

risk from the perception of the network investors and thus decreases the out year performance improvement of the system.

The dynamics in the government program are no different from the open market programs. The potential return on investment affects the probability a stakeholder will make an investment decision. A small set of variables affect this decision:

1. The risk associated with the probable return (multi-year versus multiple year contracts)
2. increased risk increases the hurdle rate by which the investor will commit to the investment
3. Multi-year is a contract guaranteed for some level of performance over some period of time (i.e., 5 years)
4. Multiple year is a contract guaranteed year to year but with an expectation of follow-on yearly contracts
5. Any uncertainty affects risk which in turn effects investment hurdle rates
6. Length of time to recoup the investment (time to rebaseline)
7. The opportunity cost associated with the investment (i.e, the second best option for use of that money)
8. The amount of return generated (i.e., cost savings harvested by network as profit) associated with the investment

Increasing the impact of the investment decision (more cost-shared savings faster); increasing the length of time to cost saving share (i.e, years to rebaseline); and reducing uncertainty associated with the return on investment all increase the probability that the network entities will invest in improvements. The environmental factors that constrain the concrete period in which the network can recoup investment increase the risk (increase the hurdle rate) and restrain investment. Restrained investment negatively impacts the performance and cost improvement. Avoidable environmental uncertainty is therefore counter intuitive to meeting fiduciary responsibility associated with taxpayer funds.



The normative implication is a requirement for policy makers to evaluate the aggregate benefit at the environmental level from constrained contract periods versus the summative increased value foregone across all networks impacted by the constraint:

$$VLNI_i^m = VCD_i^u - VCD_i^c$$

$VLNI_i^m$  = Value lost to the network due to the environmental constraint

$VCD_i^u$  = equals value created by the unconstrained decision (a multi – year contract)

$VCD_i^c$  = equals the value actually created due to constraint (multiple year contract)

The performance-oriented network model assumes that the decision maker is aware of network optimal decision:

$$VCD_i^u$$

however the optimal decision:

$$D_i^c$$

is constrained by some environmental factor (e.g., contract length, or limits on incentive).

Therefore the decision maker implements the second most optimal decision:

$$VCD_i^c$$

From a public policy perspective the impact of policy on the network and the aggregate macro-marketing structure is positive if:

$$\sum_i^N VGSI_i^c > \sum_i^M VLNI_i^m$$

That is the policy is “good” if the summation of network value lost due to the particular constraint is less than the value created for society by the institutional constraint.

The axiom in government performance-oriented approach is the “but for the incentive the harvested savings based profit would not have occurred.” This means that in a year-to-year approach the only investments network partners can make are ones that are recoupable in one year. To do otherwise is irresponsible to the network shareholders, regardless of the historical precedent that “the government will of course execute the following year option.” The market place decision makers have a first order responsibility to effectively manage the share holder’s funds. In a multiple year contract environment those improvements that would have paid off in two, three or four year period under a five-year multi-year contract are simply never realized.

Alternatively in an incentivized multi-year performance-oriented strategy the contract length represents a “market force” in which the network shareholders can recoup their investment. During that period of time the cost to the customer remains the same as in a single year structure, however the performance of the system improves. The properly incentivized the network make the greatest profit by not repairing parts. That is investing to improve parts so that their reliability is significantly improved. The incentivized performance goes up because the contractor seeks to improve the part “the pen” so that the part does not fail as much in the future. Continuously focusing on the next most cost effective reliability improvement results in parts the break less, and aircraft that are more reliable. The customer generate affordability improvement when, at the end of the rebaseline period the price is reduced.

The logic further implies that as some point in time the continual reliability improvements will drive a reduction of the entire support structure. At some point tomorrow a watershed will occur and the network support structure designed for yesterday’s weapon

system reliability will become sub-optimized. Yesterday's weapon system is not as reliable as the weapon system tomorrow. The "market based" incentivizes will drive the network to reduce excess capacity and generate new sources of savings/incentive. This is an important dynamic. This dynamic implies that at some point the "market forces" will compel a group of dissimilar improvements that taken individually would not result in enough savings to generate an improvement investment. Shaped by the integrator and driven by potential incentive this group of investments will occur due to the probable return generated by impacting the overall network infrastructure.

This use of long-term performance-oriented contracts alleviates the impact of some of the historically underfunded sustainment initiatives. The current budget realities indicate that constrained budgets are unlikely to release appropriate levels of funding for "cost avoidance" efforts:

That is one thing, this year we were to define what our core sustainment is. What does it cost to do business? What does it cost to sustain?... What would be considered investment things to just go beyond our core sustainment (improve reliability). Things are customer would like, but may not have the funding. What we are trying to do is protect some of these metrics (reliability and maintainability metrics) that, unfortunately we had to cut in 2007 due to funded. And that impacted some of our metrics; we had to redo some of the metrics.

Constrained funding foregoes worthy reliability and maintainability improvements. The year-to-year funding process generates unnecessary turbulence that impacts performance. The lack of multiyear incentive restrains the network from investing:

Then you get fallout money (money left at the end of the year, which must be spent nearly immediately). What are you going to get spending that way? Last year you they gave me \$XX million as fallout money in the last month to put on (a program). So I don't have enough time to use it, to execute it efficiently. So I have to stretch it (in an inefficient way). It isn't productively spent, it (the turbulence) impacts your efficiency factors, because if I'm going to follow this

out for several years I need to guarantee that when I hire this guy I have something for him to do. Or unfortunately, if it's only one year money, by the time he suddenly becomes an efficient productive individual. It's time for me to let him go.

As illuminated earlier the year-to-year contracting consumes resources in an inefficient manner. If the aggregate good created by single year flexibility is compensated by the loss of network efficiencies then the policy is a good one. If not than the constraining policy (whether law or regulation) may arguably be unlawful when interpreted against constitutional requirements to properly steward government programs.

The shift to a performance-orientation highlights the tremendous potential in using the outyear saving as a surrogate market force. The savings provide potential sales like incentive for the network to harvest. The entities in that market strive for superior competitive performance that leads the network to invest, generate return on investment, learn, and then continue the process. In a performance-oriented strategy the committed funds represent a very tangible return on investment; savings generated through cost avoidance now becomes industry profits. This strategy removes upfront government requirements to invest. Properly structured incentives based in more flexible financial policy leads to investment decisions by the network partners. These investment decisions improve repair efficiency and reliability and lead to continuous value creation.

P11<sub>c</sub> Increased financial flexibility positively influences the performance-oriented decision process.

P11<sub>d</sub> Increase in the service-oriented mindset mitigates the impact of reduced financial flexibility

#### 4.2.2.2.3 Environment (Supplier Base)

If actionable knowledge improves the probability of continuous value creation then generating increased actionable knowledge increases the probability of continuous value creation. The investigation revealed that the supplier base represents an immense reservoir of actionable knowledge. Threats to that reservoir threaten continuous value creation.

The supplier base is an environmental factor. The individual program has limited ability to shape the macro economic factors that influence that base. As such supplier base emerged as an element of the environment. The performance-oriented decision process requires generation and dissemination of actionable knowledge. Intuitively increase in network applicable knowledge and skill increases the network value proposition. Increased knowledge applicable to a specific decision increases the probability that the decisions will lead to continuous value creation. A key source of knowledge in a performance-oriented network is the second, third, fourth, and fifth tier suppliers. The more capable the supplier base the greater the probability the suppliers will provide improved solution tomorrow.

A number of executives commented that market shifts have resulted in a decrease in the small and medium sized firms within the aerospace industrial segment. The increased knowledge consumption in a performance-oriented strategy exacerbates the negative consequences of a reduced supplier base. One reason offered for the “vanishing vender” base was the high cost of transaction specific assets required for entry into an aerospace market. Another factor is more profitable offers in alternative market segments of the technology sector.

Senior industry executives noted that a shift from a product to performance-oriented environment has increased the appeal of the defense sector to the supplier base. Industry leaders are attracted to the opportunity to compete through performance-oriented value as opposed to the previous product-oriented cost:

What we (the manufacturer) found, and here is the point, as we went out and talked to CFO and CEOs. What we found was, the CFOs and CEOs, and senior VPs saw opportunities, and this is good. There is a lot of work to be done. As we started going down the food chain. As we started talking to the logisticians they said, their reaction was we'll never be able to do that. That is hard. From my experience in other lives the shift to performance is a change management thing.

The DoD shift to a performance-oriented strategy is attractive to the CFO's and CEO's in the supplier base. This reveals a fascinating dichotomy. The stated goal in a performance strategy is increased system performance, and decreased system cost. The Department of Defense objective is to spend less and get more. Industry response to this new competitive environmental is to embrace the shift. Industry at the CEO and CFO levels see opportunity in the yet to be harvested efficiency profits. This market dynamic indicates that the performance-oriented strategy has significant inherent value potential over current strategies. The organizations at the most forward frontier of the new knowledge based environment may well have been waiting for the rest of the market to adapt to the shift. The implication is that there is tremendous efficiency to be gained in DoD sustainment and these efficiencies, leveraged through proper incentive, promises to reengage the supplier base. This is a positive implication as the supplier base represents a significant source of actionable knowledge and value potential.

In the performance-oriented strategy the key source of value creation is improved reliability and repair. Generating improved reliability and repair procedures promotes a

knowledge based renewable resource that leads to endogenous growth. The supplier's tacit skills renewed in this fashion generate continuous value potential. In response to a question on who is most capable of improving aggregate level of system performance, the answer surprisingly was not the original equipment manufacturer:

Interviewer: Who is most capable of doing that (improve reliability or improve repair procedure?)

The vendor in my opinion. The vendor is most capable of fixing the product, they know so much.

"They know so much" is a powerful statement. In the performance-oriented strategy the goal is to incentivize the supplier to improve reliability. The quintessential objective for the customer is improved cost and performance. Strong, highly technical, connected and innovative supplier base positively influences this dynamic.

The analysis revealed the supplier base as a source of applicable knowledge. These suppliers hold significant potential for improving the reliability and increasing repair efficiency "vanishing vendor phenomena" for many of the executives is a real concern. The performance-oriented partnership has intuitive ability to resolve that concern. Performance-oriented policy, guidance, and incentive structures appear to generate renewed supplier base interest in defense sector value propositions.

P12<sub>a</sub> Increased supplier base (knowledge) positively influences the performance-oriented decision process.

P12<sub>b</sub> Increase in the performance-oriented mindset mitigates the impact of reduced supplier base.

#### 4.2.2.2.4 Environment (Perception)

The shift to performance-oriented strategy has generated a number of perceptions. Some of these perceptions are informed. Others are not as informed. In general the analysis

indicated that perception presents an environmental factor that influences the execution of a performance-based strategy. Increased environmental support (financial, policy, guidance, commitment) appears to positively improve the ability of the network to generate continuous value creation. In some cases the analysis indicated that perception influenced this support.

The main perception associated with performance-oriented strategies surrounds a misunderstanding of the value proposition in a performance-oriented strategy. The promise of performance-oriented strategy requires market like dynamic. There are two simple aspects to this dynamic:

1. Creation and use of a decomposable co-managed value metric. This allows the network to understand how discrete decisions impact the overall network performance
2. The use of an incentive structure that rewards investment by network entities based upon out year return on that investment

The perception issue associated with the dynamic of investment-reward structure is the implication of a snapshot look at a performance strategy. The participants indicated that a snapshot, taken at the wrong time might not pass the “Washington Post test”. A snapshot early in a program cycle might generate concern that industry members are operating at a loss during the investment phase. Alternatively, industry and their governments may face the “outrage” over an out year snap shot. The concern here is that a snapshot look at an individual outyear profit margin, without considering implication of payback of previous years investment and necessary reinvestment, would create the impression that industry profit margin is excessive.

The penultimate performance-oriented strategy would result in some period of time where the government pays the contractor to repair nothing. During this time the aircraft



performance metric improves. Each time a contractor redesigns parts so they do not break, the mission capable rate inherently increases. Yet there any misperception associated with understanding of this dynamic reduces support for the performance-oriented approach:

Interviewer: In a pay for use environment (performance), for that to happen most effectively you have to get paid not to repair parts?

Yep. That's right.

Interviewer: and that just freaks people out, (why)?

I don't know, it is what I have struggled with too. It just makes such perfect sense to me. But....I just, I don't know. I know you'd like to get this wonderful answer from me. I guess having not been in the military and lived on the other side of the fence. That is why I struggle with it so much. I'm with you and I just think about it and I go well that would be fantastic.

The idea that industry will, during some period, get “paid to repair nothing” “freaks people out” and negatively impacts support for the performance-based strategy. A myopic focus on cost type accounting exacerbates this perception. The segment reveals both the intuitive nature of a performance based strategy, and yet a quizzical concern for why the strategy is not universally intuitive.

For those acculturated in cost accountability orientation the pay for value or performance approach is incomprehensible. Note the inflection generated in the choice of words, “It just makes such perfect sense to me. But (pause in the recording) I just, (pause) I just don’t know.” The concern flows from the segment, “that is why I struggle with it so much..... it would be fantastic.” Recall the earlier segment with the CEOs and CFOs they also understand the “fantastic” potential opportunity of a performance-oriented approach.

The attraction to a performance-oriented approach is a realization that such strategy is inherently win-win. There is also an undercurrent of desire to do things a better way. Change

that enables such strategy therefore requires a shift away from compliance and product oriented transactional (cost type) contracting, to a more performance-oriented value based relationship. The ability to make decisions, which positively influences continuous value creation may be constrained by environmental factors. Moreover these factors may be as simple as perception.

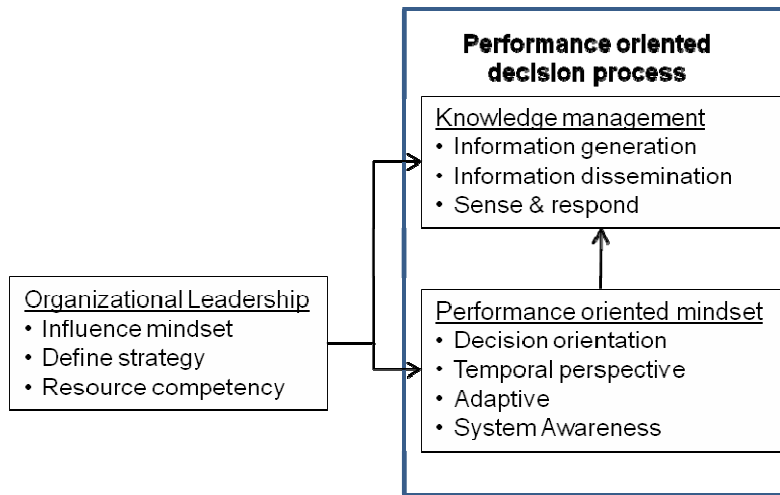
P13<sub>a</sub> Increase positive perception of performance-oriented strategy positively influences the service oriented decision process.

P13<sub>b</sub> Increase in the performance-oriented mindset mitigates the impact of negative perception.

#### 4.2.2.3 Organizational Leadership (Influence Mindset, Define Strategy, Resource Competency)

Firm leadership factors influence the performance-oriented mindset, and the performance-oriented decision process. Nearly every major category and subcategories generate some relation to firm leadership factors. Firm leadership emerged as essential to development of a performance-oriented mindset. Firm leadership harmonizes firm strategy and network spanning strategy. Firm leadership decides how to resource competencies complementary to that of the network. The firm leader must link the network performance network metrics with firm performance metrics.

Figure 11  
The Role of Leadership



#### 4.2.2.3.1 Leadership (Influence Mindset)

Firm leadership plays a primary role in shaping the mindset of the organization. One of the central tasks of firm is to bring those people “clinging to the old paradigms” into a performance-oriented mindset:

Well you have to have commitment on the leadership of both sides. So you have to get commitment from leadership, the customer has to change to that leadership role. And the industry has to change to that leadership role. Because you have a lot of, in both camps, you'll have a lot of folks that are clinging to old paradigms that you need to switch around.

Movement to a performance-oriented strategy requires “lots of leadership.” The leader drives the shift to the new mindset. The leadership accomplishes this task in coordination with “leadership on both sides.” Mindset shift links network level perspective. The leader must either reintegrate and reeducate the “camps” clinging to the “old paradigm” or disband those camps.

Yes there is a cultural piece to that. How do you change those mindsets? There is a huge education piece to that has to come with this. Because this is cultural. How long does it take to change a culture? Most experts say with a concerted

effort. I mean with leadership, lock step, and not deviating from it, seven to 10 years. With all of the energy it takes to be able to drive that change in. And if leadership is not bought in? Well now it takes even longer.

Firm leadership plays a primary role in shaping the mindset of the organization. The firm leadership ability to shape the organization mindset in a performance-oriented fashion positively influences the performance oriented decision process:

I have witnessed firsthand here in the organization as the PBL execution goes down below the firm leadership level they do not support it, or just don't get it. And most part they don't get it because they have not been educated.

Interviewer: So there is a component that, earlier you said leadership, so you think there is a deliberate component of this that you must re-educated those who can either touch it (PBL) get in the way of it, or impact it?"

Absolutely, absolutely, and they must be the people that have specific actions that contribute to the ability to impact PBL performance.

The firm leadership "gets it" yet below the level of leadership there are those that "don't get it, they don't support it." The leader's task is to change the mindset of those who do not "get it." The leader influences mindset through education "they don't support it, because they have not been educated." The strategy for efficiently managing the mindset shift begins with the "people that have specific actions that contribute to the ability to impact" the program with the new mindset.

The analysis generated a code for culture, yet culture was a confounding construct. Culture tended to mean many different things to many different people. Culture simply did not become a dominant category, nor did it fit into a dominant category. The placement of culture with respect to the emerging model remained elusive for some time. It was not until the analysis began to integrate leadership as a category that the placement of culture became clear:

I believe it PBL is a mindset. I really believe that PBL today is personality driven. If you have intuitive knowledge of what PBL can do, yes you will do well at it. But if you are just learning what PBL is you will not be very good at it.”

So when it comes to making the priorities, when you set out the metrics, or the goals that you set forward. Knowing that you are driven, ultimately to those goals. Now you have subsets that are going to get to understand the goals that connect to them. Then anything that you are not doing, or anything that you are doing that is not focused towards the goals, that is less valuable. It is not that it might not be important. It is a matter of how you set your processes in order to be able to be driven out here to get to these metrics.

The link between leadership and performance-oriented success (to do PBL well) is not culture but mindset (personality). The mindset is composed of intuitive knowledge and predisposition to act on that knowledge and awareness. Culture on the other hand is inherently a more aggregate, less defined, and less actionable organizational level phenomena. The interview segment links the ability to gain intuitive knowledge in through some learning process, and that if you are “just learning what PBL is you will not be very good at it.” The organizational shift in mindset occurs through individual shifts in mindset. Quicker “learning what PBL is” increases the speed of this shift. Therefore firm leadership activities that quicken that learning have a positive impact on performance-oriented success. Mindset, not culture, more accurately captures this dynamic; the link between mindset and decision is more direct:

My concern is that it is going to take a very fundamental change. As we start setting the stage for an acquisition across Air Force and the approach to doing support across Air Force. This is, there are some people who want to continue doing what they're doing and call it performance-based logistics. That is a performance-based logistics.

Some want to continue to do what they do; they resist a shift to the performance strategy. That activity (resistance) as observed in the investigation illuminates the underlying structure and the nature as the organizational system adapts. The system struggles to adapt and through a

change in mindset. The analysis confirms (assuming rational actors) that the environmental structure is changing and this change requires a mindset shift. In this shift there are those who will resist. The interview segment highlights the significant task for firm leadership is to move the organization collectively into the new mindset:

Without a doubt. Without a doubt. if you saw what this is taking, in this company, to get the mind set changed it is unbelievable. The amount of time it has taken.

Leadership continually reinforces mindset. Leadership finds the most efficient mix of activates, such as education, rewards structures, esprit de corps, and applies them in a way that most efficiently facilitates the shift to a performance-oriented mindset. The shift requires maintenance of the mindset. A few participants recalled early PBL programs where, after the initial excitement associated with the performance-oriented strategy wore off, firm leadership shifted their attention in different directions. The performance strategy stifled, the culture reverted back to the old ways of doing business. A performance-oriented mindset requires continual reinforcement to seek system level knowledge and make decisions that increases the value propositions of the network:

I think the mindset is a continual emphasis; our president coined it about 15 years ago. Relentless pursuit of customer satisfaction and that means that you understand what the customer needs, and you try different fashions to provide those (evolving) needs. Whether it is a good pickup on a call, a quick answer on a question, or a response on the proposal. There are many elements where we can demonstrate that we are focused on customer satisfaction. So I think it's translating that mindset down.

The mindset requires a adaptation and then constant reinforcement; captured here as “relentless pursuit.” The leadership role in the shift to a performance-oriented approach is to overcome resistance and transform the mindset of the organization.

The effectiveness of the execution of the performance-oriented strategy is contingent upon leadership's ability to change, and maintain that change in, mindset. The analysis indicates that change occurs (and is maintained by) by education, training, organizational structure, and a reward program that clearly links efficient performance-oriented decision with continuous value creation. That ability requires high fidelity system level awareness, capable of adapting quickly in search of continuous value creation.

P14<sub>a</sub> Increased performance-oriented leadership influence on mindset positively impacts the performance-oriented decision process.

P14<sub>b</sub> Increase in the leadership emphasis on the performance-oriented mindset positively influences the effects of the performance-oriented mindset.

#### 4.2.2.3.2 Leadership (Define Strategy)

Firm strategy harmonized with network strategy influences continuous value creation. Firm leadership defines strategy to maximize the firm's value proposition. Firm strategy pertains to information systems, concepts relating to sharing with partners, strategy with respect to integration, strategy for dealing with environment, strategy for resourcing, and numerous other strategic categories. From a network context firm leadership aligns firm strategy with the network strategy. The term firm leadership in this context applies to government and industry organizational leadership

The firm leadership in concert with the integrator rationalizes the proposed network strategy with the firm strategy. The firm leadership aligns firm resources to effectively harmonize network optimal performance while still satisfying the firm's value proposition:

Right now there are a couple of depots that are looking at how they structure their rates in order to make themselves competitive enough to offer a good deal.

The network integrator works with industry firms and government organizations to align strategies. The segment reveals that some government repair agency leaders are developing strategies (rates) aimed at provide a network value proposition (offer a good deal). The performance-oriented firm leadership aligns the firm strategy with the network strategy.

This alignment must overcome previous path dependencies of the product-oriented approach. The task of aligning organizations with the performance-oriented network strategy is more difficult for some organizations than others:

I would say that this is a culture it is not a competitive culture. Over 45 years what has happened is the commercial world and the organic worlds have been driven to compete. And in doing so we (industry and government) have created policy and regulations and internal business practices and information technology systems that are different from each other. Now the government is saying go marry that person become part of a partnership. The expectation is that we will just simply like it (the partnership). Now you go in and there is nothing (performance-oriented antecedents). There is no policy there is no incentive, there is nothing.

The statement “not a competitive culture” contrasts how the organizations adapting to different environments grow incommensurable. The actions and activities of the entities are rationale to themselves, but not to each other. The “government is saying go marry that person and become part of a partnership”, yet the strategies and structures are incommensurable. This leads to predictable tension. Tension created for industry entities as they attempt to communicate strategically with the government entities. The “arranged marriage” creates tension; one entity is comfortable and structured for a performance-oriented environment, the other is uncomfortable and unprepared. The significant task then for the government leadership is to adapt and resource the organic strategy in a way that aligns with the network performance-oriented strategy. These adaptations require leadership review and rewrite to



institutional level policy as appropriate to facilitate the performance-oriented strategy. The government and industry firm leadership have an implied obligation as stewards of national resources to address these constraints. The government and industry entities who are most in contact with the shifting environment understand the negative impact that misaligned law has upon the efficient expenditure of taxpayer funds.

Execution of the performance-oriented strategy requires harmonization of individual firm strategy to support the network objectives. The leadership must impact firm infrastructure policy and regulation to increase the firm's network oriented value proposition. The success of the performance-oriented strategy is contingent upon the leadership efforts that to align firm strategy with network optimal objectives.

P14<sub>a</sub> Increased performance-oriented firm strategy positively influences the performance-oriented decision process.

P14<sub>b</sub> Increase in the performance-oriented mindset positively influences the effects of firm leadership.

#### 4.2.2.3.3 Leadership (Resource Competency)

Firm leadership determines how to effectively resource competencies to maximize the firm's value-proposition. The shift to a performance-oriented strategy requires a reexamination of tangible (equipment, facilities, information system architecture), and intangible (knowledge and skills of the employees) with respect to the objective of a performance-oriented strategy. Leadership actions that generate performance-oriented competencies lead to continuous value creation.

The value creating engine in a performance-oriented strategy is knowledge. In a performance sustainment network these knowledge based resources are expertise in materials, engineering, finance, etc.. The resources are also skills such as metallurgical skills, corrosion

prevention skills, repair skills, etc. Performance strategy requires leaders to resource competencies that positively influence network value propositions. The performance-oriented strategy requires firm leader actions that generate competencies that positively influence network continuous value creation. For instance, in the performance-oriented strategy the focus in repair shifts to not only repairing the individual item, but also comprehending the root cause. The overarching goal is to efficiently drive failure modes out of the system. The performance-oriented approach dictates a repair philosophy that generates increased knowledge into root cause. This is a different philosophy than a repair and return product-oriented approach. These disparate approaches require different resource application to develop firm competencies:

If you look at the R&M pots of money out there, there is no pot of money there is no line of money for reliability and maintainability improvements. There's nothing out there to do it with. Yet the potential outyear savings are huge, tremendous.

The shift to a performance-oriented strategy requires a shift in the decision process that leaders use to resource competencies. Continuous value creation is a dynamic process this process highlight the negative effect of fiscal constraints, such as “no pot of money, no line of money for reliability and maintainability.” The priority for resources in the performance-oriented approach goes beyond repair to system improvement, “yet the potential out year savings are huge, tremendous.” The shift to the performance-oriented strategy requires competencies resourced in alignment with network level objectives.

The performance strategy increases the link between firm activities and customer value. The ability to efficiently generate knowledge of the customer sense of value is a firm

competency. Firm competencies that generate efficient comprehension of a customer sense of value positively influence continuous value creation:

I think that you are more focused because the PBL is, it goes back to something I said earlier, the PBL is your reason for existence. If you were not good at it, you are not the customer's best value, there is no reason for you to remain.

The performance-oriented strategy requires development of firm competency with respect to understanding the customer perception of value. Leadership actions that resource these types of competencies influence the ability of the firm to provide for network-optimized value propositions.

The product-oriented strategy focused on producing a part and returning that part to original specification. The shift to a performance-oriented strategy requires a relook at firm leadership resourcing activities. Performance-orientated network strategy clearly identifies the link between firm activities and network level objectives. The ability to act on that link requires the firm leadership align their resourcing policy to support the network strategy. Firm leadership activities that resource knowledge enabled competencies provide continuous value creation.

P16<sub>a</sub> Increasing performance-oriented firm competencies positively influences the performance-oriented decision process.

P16<sub>b</sub> Increase in the performance-oriented mindset positively influences the effects of firm competency resourcing.

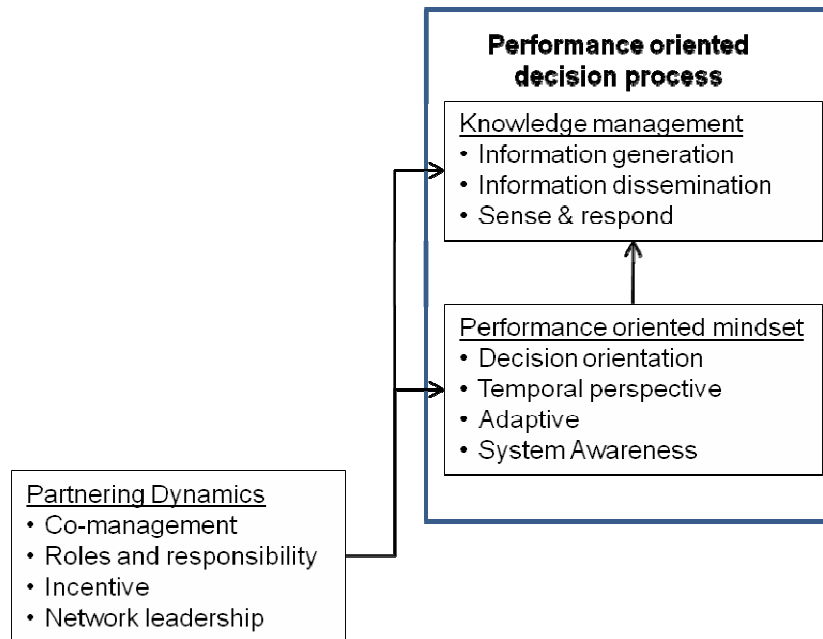
#### 4.2.2.4 Partnering Dynamics (Co-Management, Roles and Responsibilities, Network Strategy, and Environment)

The analysis revealed partnering dynamics as an antecedent of the performance-oriented decision process. The performance-oriented strategy requires knowledge based adaptive and proactive approaches to inter-organizational relationships. The word frequently

used to capture this relationship was “partner” or a “partnership.” The analysis revealed that partnership as a multidimensional category. The category is composed of co-management, roles and responsibilities, incentive, and network leadership. In the performance-oriented strategy actionable knowledge is the raw material of continuous value creation. Effective partnering dynamics improves the reservoir of actionable knowledge by increasing the efficiency of knowledge generation and dissemination in support of continuous value creation.

Figure 12 presents the category of partnering dynamics and its elements. The first element of partnership is co-management. This element applies to both network co-management, and co-management with the customer. The second element is roles and responsibilities. The performance-oriented strategy requires dynamic and adaptable structure for assigning roles and responsibilities. The third element is incentive structure. Incentive is the bedrock aligning the performance-oriented network. The incentive provides the learning link between discrete decision and impact on value. The last element is network leadership. Network leadership harmonizes firm leadership with network objectives. Network leaderships also impact the environment in support of a networks continuous value creation.

Figure 12  
The Role of Partnering Dynamics



Performance-oriented strategy requires a partnering approach structurally different from that of a product-oriented approach. Partnering was a major focus in describing the move from product-based strategy to a performance-based strategy. The performance-oriented approach requires re-conceptualization of how to align inter-organizational relationships. Contracts, clear deliverables, and prescriptively laid out roles and responsibilities that define the partnership approach in a product-oriented relationship are incompatible with a performance-oriented approach. The performance-oriented partnership focuses on understanding the customer's sense of value, establishing a metric, and then connecting that metric to the incentive structure of the network in a dynamic fashion.

#### 4.2.2.4.1 Partnering Dynamics (Co-Management)

Co-management emerged as a collection of codes that represent the mechanism whereby performance is improved through communication, expectation management, information sharing, collaboration, relationship with the user, customer accountability, network advisory councils, shared risk and inter-dependent involvement. Co-management involved all network members. The analysis indicated two distinct types of co-management. The first type is co-management among the network partners. The second is specific co-management with the customer.

##### 4.2.2.4.1.1 Co-Management (Network)

Active network co-management increases buy in, knowledge sharing, and commitment. The network represents a cost effective source of solutions. The network provides knowledge such as knowledge of improved materials and improved processes. Many times the high value knowledge solutions lay with third and fourth tier suppliers. The trick in a performance strategy is focusing that expertise away from transactional approaches and toward a knowledge based value-generating continuum:

So we know a lot of these vendors have a lot of experience on PBL. So what we have done is formed a working group. And I have asked for volunteers, because this is not in their contracts. I might also have folks at any given meeting from our side. These might be businesspeople, the supply chain people, and various other functions. That makes up this group. And I bring hard problems to the table, and we as a group begin to work the problems. Because I have to have their input, because so much relies upon them, for this program.

Active and proactive co-management aligned toward network level performance leads to continuous value creation. For “this program” “so much relies on the suppliers”; so much relies on co-management in highly performance-oriented programs. “This program” is a leading edge

performance-oriented network. The network co-management construct transcends static structures, “and I have asked for volunteers, because this is not in their contracts.” The suppliers buy in because they see value potential in the co-management relationship. The increased knowledge generation and dissemination of co-management provides that value potential.

The more advanced performance-oriented programs place greater effort on the collaborative activities of co-management. This collaboration removed most of the traditional constraints on data and strategy sharing. The leading-edge programs use collaborative structures to efficiently disperse risk network wide. The most leading edge program created a supplier advisory board. Knowledge generating in this collaborative structure increases the probability that the *network* will develop innovative solutions to the “hard problems brought to the table.” The advisory forum co-manages the creation, evolution, and decomposition of the customer value metric. Strategies for information sharing, access agreements, and enterprise wide knowledge management made up a significant part of the observed activities of the co-management forum.

It makes sense that the performance-oriented program would increase the level of co-management. One of the strategies routinely that emerged from the highly performance-oriented network is to gain investment (knowledge and capital) from the suppliers for reliability improvements that result in potential outyear savings and increase profitability. One participant actively involved with the supply base on a leading edge performance program discussed how co-management provides greater network wide knowledge generation. This

passage reveals the perceived relationship between co-management and knowledge generation:

The supplier working group happens every couple of months. That is how we keep them focused, because we always bring our problem, here is how it relates to you, now help us to figure what is the best way to do it. So it is not like we are dictating down to them, and is like they're helping us. Because they have all this wealth of knowledge.

Co-management harvests “all this wealth of knowledge.” The highly performance-oriented network provides dimensionality to the relationship between knowledge conversion and value. The advisory board is collaborative it is “not like we are dictating.” Did the previous product-oriented programs dictate? Why? The network-optimized goal of continuous value creation focuses on an evolutionary “best way to do it” processes. The interview segment provides a glimpse into a performance-centric mindset. The venter advisory board is new. The participant received support from senior network leadership. The manager’s mindset is oriented toward performance. Firm and network leadership supports this mindset. The result is an increased ability to generate knowledge, solution, and continuous value.

Co-management is the knowledge-based lifeblood of a performance-oriented network. The heart of that immense “vascular” network is the integrator. The integrator ensures network wide flow of actionable knowledge in support of the most optimal decision:

So that maybe you don't attack all your MICAPs (aircraft grounding) but you look for those that could possibly be a total non-mission capable supply drivers (the greatest bang for the buck).

Interviewer: so you're saying that the current focus is kind of on requisitions, products coming through?

In the current way of doing business there is no direct correlation between requisitions being filled and flying hours, there is no feedback... I think there's a lot of communication that's required.



Co-management is inherently “a lot of communication.” Co-management provides proactive linkage between positive impact of the decision process and the ability of the integrator to provide a system level focus. This process requires efficient network wide information systems to ensure repair of the “right part” at the right time. The repair organization in the previous product based approach focused on filling aggregate level requisitions. Yet the reality is that some grounded aircraft only required one part for return to service, the product approach masking possible efficiency gains. The shift to performance-oriented metrics generated a group of face-to-face meetings, co-management, which unmasked the process inefficiencies and led to increased network level performance.

Greater network co-management increases the efficiency of the network knowledge generation and dissemination process. Knowledge represents the key resource in a performance strategy. The increased generation and dissemination of actionable knowledge in a timely fashion positively impacts continuous value creation.

P17<sub>a</sub> Increased network co-management positively influences the performance-oriented decision process.

P17<sub>b</sub>, Increase in the performance-oriented mindset positively influences effect of network co-management.

#### 4.2.2.4.1.2 Co-Management (Customer)

In a performance-oriented strategy co-management entails broad stakeholder involvement to include the customer in a dyadic and interrelated role. The performance-oriented managers spent a great deal of time discussing co-management with respect to the customer. Customer co-management generated a dozens of codes and more than one hundred segments. One of the abilities of MAXQDA is to represent intersection using color and size; intersections associated with customer co-management were some of the most intense. The

customer co-management category encompassed various segments dealing with relationship with the user, customer accountability, understanding of the requirement, field service representatives, and performance improvement. In a performance-oriented strategy customer co-management appears as a key subcategory.

As with network co-management, customer co-management is a valuable source of knowledge. Increased customer co-management also reduces some of the uncertainty surrounding value proposition evolution. In response to a question on what it takes to accomplish a performance strategy one senior manager responded:

You obviously have to have a clear understanding of what the customer's requirements are. Then there has to be on the flip side, the customer has to understand what our goals are.

Clear understanding of the customer's requirement is an essential element of co-management. This clear understanding is a dyad. The "flip side" in a performance-oriented strategy is the customer is not only a partner but is also accountable. The customer is not a target of the network activity but a knowledge-based resource capable of increasing the efficiency of network value proposition.

Customer co-management requires all exchange partners understand current performance, understand each other's expectations of future performance, and collaborate cross network to satisfy the performance requirement. In a performance-oriented strategy the network is highly focused on the customer requirement through the value metric. At the same time the customer is brought into this dyad and plays an active role increasing the networks efficiency in meeting requirements:

The customer needs to, we have to be tied to their processes. We have to know, and use their processes.

Interviewer: By know? Do you mean that you have to be connected somehow?

Yes, and they also have to know how we operate, and how we do things. I think that is the only way we are going to be able to achieve success. If they (customers) do not understand how our business process works, or, because you see they have this goal, whatever it is, but if they don't understand how we go about things, so they sort of just drop it (requirement) on us, and we just can't react like that. Or that isn't something that we are capable of doing at this time than they have wasted effort, and wasted opportunities... you almost become, it sounds kind of motherhood and apple pie, but you almost become one team. You know.

Interviewer: Focused on that performance?

Yes.

The participant states "team" is overused, but he is motivated to use the term team here. What motivates this usage? The term team supports the emerging conceptualization of partner based co-management. The shift to performance revitalizes the term "team." The network seeks to understand each other's "business processes." The industry participant explains the manner in which co-management increases network efficiency. Co-management illuminates tradeoffs between resource expenditure and efficient satisfaction of customer value proposition. Network optimization requires co-management to understand the impact of the "just drop it on us" request that results in "wasted effort." Increased understanding may reveal that "wasted effort" may have a more optimal application. The network desires dyadic customer orientation. The network looks to understand the customer sense of value and then provide feedback to the customer on total value. In turn the network generates increased knowledge of the customers evolving value proposition. This feedback provides the network increased ability to generate an anticipatory response and provide continuous value creation.

Active interrelationship focuses understanding of each other's value proposition. The interrelationship encompasses shared authority, insight, and responsibility. A number of participants contrasted active performance-oriented co-management with linear product-oriented strategy:

Thinking back to my (other product programs), we told the field that (during the depot activity, this is the areas we access. But we did not go back to the customer and say while we are in there are there other things that you need us to do? Are there reliability and maintainability things you want us to look at? Are there things that are just kicking your butt? So, because we are tied to the customer's success if the customer does not make the pilot training objectives, which is one of our objectives, if the customer does not achieve that we failed. So now the thought is I have to know how the customer does business. I also have to understand what the customer is dealing with."

The shift from product to performance focuses the act of co-management. On "other programs" the mindset was to merely tell the user "the areas accessed" during overhaul. There is no network level incentive that drives proactive network optimized performance. The overhaul agency simply performs the overhaul to predetermined specifications. The performance-oriented collaborative incentive structures are absent. However in the performance-oriented strategy the focus on the network value metric drives behavior that seeks increased knowledge to provide greater value (sense & respond) "while we are in there are there other things?." Co-management with the customer leads to continuous value creation.

Co-management entails a more adaptive and dyadic customer relationship. Customer value evolves and as that value evolves so does network response. To optimize this process the customer adopts a more proactive role in a performance-oriented strategy. The customer bears responsibility and accountability to achieve continuous value creation by

articulating how the performance creates value. Customer co-management creates efficiency by closing the gap between the value metric and “true” value.

Customer co-management results in more precise decisions of how to best manage network assets to meet high fidelity customer requirements. Greater co-management between the network members, the network, and the customer results in actionable knowledge generation and dissemination. This leads to continuous value creation. Co-management recognizes that the value propositions today may not be the same tomorrow. The performance-oriented decision process efficiently connects ability to sense and respond to these value shifts through active customer co-management.

P18<sub>a</sub> Increased customer co-management positively influences the performance-oriented decision process

P18<sub>b</sub> Increase in the performance-oriented mindset positively influences effect of customer co-management

#### 4.2.2.4.2 Partnering Dynamics (Roles and Responsibilities)

The transition to performance-orientated strategy reveals a shift in the conceptualization of roles and responsibilities. The product-oriented contract lays out many of the roles and responsibilities. The performance-oriented strategy requires underlying flexibility to optimize decision. The flexibility requires adaptive roles and responsibilities. The performance-oriented programs anticipate that the solution to the problem today given new network knowledge may not be the optimal solution to the same problem tomorrow. This dynamism requires that optimal solution dictate the roles and responsibilities. This assignment should not be constrained by predetermined contract structure.

In the shift from product to a performance-oriented strategy supplier roles evolve. The product-oriented supplier partnership is oriented to static repair to specification strategies. The

performance-oriented strategy actively seeks improved reliability instead of simply returning parts to service. This requires adaptability in roles and responsibilities in search of continually more optimal solutions. Contractually determined boundaries constrain optimal response. In a performance-oriented strategy the norm is right actor executing the right solution at the right time:

You are going to need to switch things around and say okay, this may not be directly in the contract. But I will go do it even though it may cost me a little money, but over the long term there is benefit; you're thinking over the long term versus the short term.

With a performance-oriented mindset “you’re thinking over the long term versus the short term.” This mindset is unconstrained by contractually limited roles and responsibilities. The performance-oriented mindset senses the incentive in making a non-contractual decision based upon long-term continuous value creation. In the performance-oriented strategy roles are fluid, actively reassigned and redefined as the play develops.

The flexibility required by a performance strategy is antithetical to a functional focus or “stove piping” as referred to by the participants. Stovepipe implies decisions optimization to reduce the burden or increase the power base of a specific functional area such as contracting, engineering, or finance. Stovepipe also refers to activities that optimized a particular system, i.e., a desire for “gold plated” support equipment. The performance-oriented strategy puts the value metric spot light on the inefficiency effects of stove piping. Greater the link between decision and continuous value creation reduces tolerance for affectless decisions:

If you are stove piped what you are trying to achieve? If you are a supply chain guy you are trying to achieve fill rates, you are trying to manage warehouses. You are doing location accuracy. It is very hard to shift to I do not care about fill rates. I care about up aircraft performance. That is a tough transition. Good

folks, good mechanics, you have to have that skill set that puts the (business) wrapper on the process to do that.

Performance-orientation puts the “business wrapper” around network decision. The network optimizes decisions against the whole not the function or the part. This transition is intuitive for some, for others it is “a tough transition” as the classic roles change and power structures shift. The goal is not a supply chain metric in itself such as fill rates. Instead the objective is to understand how fill rate decisions influence the network performance metric, in this case mission capable aircraft,

The focus on the continuous value creation aimed at the system level goal attainment optimizes discrete decisions:

Now the challenge is that some of these cut across different “ilities” (functions). And that has been hard for people to get their mind around. Because the supply chain guys says this is all mine. The maintenance guy says this is all mine. And this is where I said no, not so fast. This is where the pushback comes. Well I own this and I will tell you how we are going to do that. And I said, I am saying that we own this from the team with the customer, and this is how we should perform.

The “team” approach with the warfighter (customer) and the network focuses on the customer perspective of value. Performance-orientation highlights sub-optimization by the “ilities.” The leadership task is to shift roles and responsibilities to focus on “how we should perform” to impact the value metric. In a product environment responsibility can be sub-optimized toward an individual discipline or to a particular subsystem. In a performance environment responsibility is to network optimized performance.

The participants indicated that terms like “that’s mine”, “I take care of that”, or “that’s how we do it here”, have little place in a performance-oriented environment. Optimized solutions dictate “who does what.” The shift to performance-orientation challenges historical

role assignments. The value proposition assigns roles and responsibilities. The task goes to the entity with highest probability of generating optimal decision effect.

The performance-oriented strategy requires dynamic role assignment. The dynamic role assignment generates a flexible response that results in improved value propositions. This cross network role assignment reveals wealth overlooked in a product-oriented approach. The performance-oriented strategist looks enterprise wide to reveal win-win opportunities:

Well at that point it is truly looking at the whole enterprise. And I will give you an example. And this is something that we are looking at within my group. I want to say I am getting \$XX per flying hour. And I want to pay all my bills with \$XX per flying hour. And that whole enterprise is what I have to look at. What I am going to start to do is looking at certain things. For example if I have a certain set of suppliers that have a footprint in Australia, but they don't have a footprint in Europe. Well guess what? Why buy more warehouse space? Why allow a supplier that does not have a footprint in Australia to buy warehouse space there? When he could buy warehouse space from one of my existing suppliers that is already in Australia. Okay, now they will not do that necessarily on their own. As an integrator I need to look at that and say right supplier, we need you over there, but use that facility. Because we are already paying for it, just use that facility.

The performance mindset optimizes network level value efficiencies on tens of thousands of discrete transaction. The performance-oriented decision maker seeks continuous value by generating dynamic solutions and challenging static response, “uses that facility” “why?” Not because “you” are paying for it but “we the network” are paying for it. Warehouse assignment shifts toward the network oriented optimal solution. This level of optimization implies a significant awareness of the overall network function. The participants indicate that the ability to perform this level of optimization requires an ability to effectively harness technology and the incentive structure to continuously and efficiently focus activity on evolving network value propositions.



The performance-oriented environment generates a requirement for dynamism. The solution set today (the most efficient mix of roles and responsibilities) will most likely not suffice tomorrow. The performance-oriented expectation is that the network will have greater actionable knowledge tomorrow to fulfill an evolving value proposition. The pace of the evolution in a customer's sense of value influences the required rate of adaptation. The network oriented to continuous value creation rewards flexible assignment of roles and responsibility. The optimal solution dictating who does what, not who did what.

P19<sub>a</sub> Increased performance-oriented assignment of role and responsibilities positively influences the performance-oriented decision process.

P19<sub>b</sub> Increase in the performance-oriented mindset positively influences effect of performance-oriented assignment of roles and responsibilities.

#### 4.2.2.4.3 Partnering Dynamics (Incentive)

The incentive structure in a performance-oriented strategy creates a dynamic network decision process optimized to satisfy tangible value propositions. The leading edge performance-oriented networks measure real time customer sense of value. These networks then decompose that value and assign incentive to network actors based upon that decomposition. This process leads to endogenous learning through profit. This is not a simple task, the structure requires a robust integration ability to decompose and assign the incentive in an equitable fashion. The efficiency and effectiveness of integration in this process directly influences learning and subsequent value creation.

During a member checking session one senior industry manager, an engineer, questioned the feedback associated with the emerging theory:

Ok, I understand the system approach, but how do you get a feedback loop in that model?

The incentive is the feedback. The grounded theory emerged a systems oriented model. The feedback in that model is incentive, or profit. The shift moving from product to performance-orientation is the reconceptualization of reward structures. The performance-oriented strategy seeks to assess the impact of discrete decisions on the network value proposition, and then reward network entities proportional to that value proposition.

The data to support performance-oriented strategy has always existed. However previous network “co-management” systems did not allow integration in a timely and cost effective manner. The leading edge performance-oriented programs demonstrate that recent advancements in enterprise wide solutions, modeling, and decision support systems make the performance-oriented strategy achievable and effective. The enterprise solutions provide network members real time insight into the performance of their sub components. This allows real-time ability to sense performance and respond in a dynamic fashion. The enterprise solutions increase the positive relationship between investment decisions, value creation, and incentive. The greater the incentive alignment the greater the learning; superior incentive (such as profit) is a signal to the network participants that their decision and response was correct. The signal (profit) reinforces the behavior. The expectation is that such behavior will result in future incentive. In a free market dynamic the actor continues to seek decision success in order to gain more incentive.

The decision success in a performance-oriented strategy is dynamic and continuous. The imperative of a performance-oriented strategy is to align incentive, discrete decision, and impact on customer value metric. This alignment is the responsibility of the network integrator. Integration attends to the complex task of decomposing network performance outcome and

judiciously assigning incentive. Network learning is directly proportional to the efficiency of the integration function. Continuous value creation is contingent upon learning.

The key to this is, and it dawned on me about a year ago, is that commercial companies go after a market. And if they can see that they can get into that market. What they do is they exploit it by updating their product all the time, to keep that market share. That is the same thought process that our vendors are using. Because a lot of them are doing commercial work.

The analysis revealed two general approaches to financial incentive strategies. The first is “award fee”, the second is “value harvesting.” The award fee incentive occurs when one network entity, according to an agreed to plan, rewards performance of another entity as evaluated against that plan. The value harvesting incentive starts with an agreed budget and performance. Once the budget, time horizon, and performance goals are agreed to, the actors are allowed to keep or share savings harvested while maintaining the agreed to performance. The customer gains incentive through increased performance and long-term affordability.

The analysis revealed a significant network focus on incentive structure and strategy. This is for good reason. Incentive represents pure profit. While incentive is not unique to a performance strategy, the ability to generate incentive based upon decomposed impact on performance is unique.

Incentive in a product strategy is associated with delivery of an item in a static linear focus. The incentive in product-based programs aligns performance with product. The incentive in the performance-oriented strategy rewards the efficiency of achievement of a dynamic and evolving goal. In the performance-oriented environment value is dynamic and evolutionary. The incentive in an advanced performance-oriented strategy is oriented to harvesting dynamic value that the product-oriented approach previously obscured:

I'll tell you how I'd like to structure a performance strategy. (Drawing on the board). What I always wanted to do was have your initial contract (cost per flying hour fixed) for five years. I'm perfectly good with that, that gives you enough time to recoup the investment and improve the reliability. Five-year contract. But what I want is a rolling window. So the end of that first year, if I've met all of my metrics then, I would like to get the next year, and at sometime in there to be fair to the government, at some point, towards the end of that first five years, say at a four-year rolling window I will renegotiate the contract. So all the improvements that I make in the first four years I get to reap the benefits of that (savings between what cost per flying hour was, and what cost for flying hour is), for whatever is on contract at that point. Whatever the window is, at some point I will reprice, contract so that out here (right side of board) you the government get the savings (incentive for government). And I have to earn new savings (introduce improvements), to make extra money out here. So I don't make a huge profits, in other words if you sign me up and if I don't renegotiate this price, I can make a ton of money (realization that there is tremendous potential in the strategy).

Interviewer: okay let me check this with you so you're saying that, you would be willing to redesign here (left side of board), but in order to recoup your investment here in the front, you're going to need to make a decent return in the out years out here? And for the maintainer (customer) it's good because the aircraft aren't breaking?

Right.

Interviewer: it's interesting though it's one of the few times where if you're (contractor) making money not repairing parts. That means I don't have to fix airplanes (incentive for the user)... if the parts don't break that means the airplanes don't break.

The incentive structure (value harvesting) harmonizes customer and network goal achievement.

The incentive rotates the tiers of the supply chain; the outcome metric commands the attention of each network entity. The incentive structure links investment and reward. The investment decision is proportional to the potential reward. As harvest period increases the network is more likely to invest in cost avoidance strategies.

However this is in conflict with the users desire to harvest the savings. The co-managing network leadership rationalizes this dichotomy through the realization that “but for incentive”

no investment and no saving would occur. The customer in a performance-oriented strategy therefore receives increased performance through improved reliability. At some point the network member agrees to “reprice”, or as mentioned in other interviews “rebaseline” and the system becomes more affordable. The performance-oriented decision process constantly looks long term to weigh the investment and incentive:

You have to look at it from what is going to get me in the longer-term. You know where I am incentivized to keep my performance at the lowest cost. So if I can fix the part so that I don't have to keep buying new ones, or getting new ones put into the system then the incentive comes in. But you rely on your supplier base to do that as well.

The incentive focuses the integrator and the supplier base toward long-term continuous value creation. During an observed supplier meeting the phrase frequently used by network participants was the ability to “incentivize the correct behavior”. The correct behavior is behavior optimized to network continuous value creation:

Interviewer: Your vendor will hopefully be, closer to maybe some emergent technology.

Right.

Interviewer: So that maybe the (system) of three years from now be a better (system)?

Right, but the incentive for them to do that, because they have always had that capability, it is true they have always had that capability. The incentive is how do you get them to want to infuse that technology, or that capability? And in the past they have been paid on breakage. If it breaks I will pay you for it. The new paradigm is now you're going to get paid a dollar per usage. So as long as that thing keeps working, you are getting paid.

The performance-oriented approach is value driven. The old “paradigm” establishes a cost for repair. The new “paradigm” focuses on a price for value. The text segment reveals industry, “they have always had the capability, it is true.” This is a fascinating exchange and remarkable

wording. The added “it is true” phrase gives the story an air of the inevitable finally occurring. “They have always had the capability”. Why then was that capability not harvested? The performance-oriented environment reveals a fertile market with tremendous potential value largely unharvested.

Proper incentive structure leads to “entrepreneurial sustainment.” The incentive structure creates a value proposition that drives the integrator and industry to look for dynamic long-term win-win solutions. The incentive works to entice the “entrepreneurial sustainment network” to invest industry resources in expectation of potential reward:

Ultimately we (industry) would like to see a longer-term contract to incentivize behaviors with a longer-term contract. That (incentive) is hard to do with one-year money. I cannot go make a business case with my folks for investment because I have to recoup that within a one year contract. With longer-term contracts I can now leverage the beauty of business community and say hey it's really worth it for us to invest in reliability. We're signing up for this metric if I'm more anticipatory, if I'm out there solving the problem that I can guarantee a performance at this level. I have to, I've got to market to both sides, I have to market it on my business side. Because they're comfortable with my transaction base business. You know they understand transaction base from the business side. They understand that x-number of transactions will happen every year (and) we (like to) make this amount of money and it looks like we would have this level of profit margin. It's a two-way sell I have to sell to the Air Force so we can execute it, I still have to go and sell it to the business community that this new entrepreneurial way of providing support makes a reasonable business case to them.

Industry investment links decision, integration, and stakeholders in search of outyear reward.

Innovation is less of a technical break through and more of a business case. The innovative reliability improvement programs emerge by cultivating a proper “business case” with the industry stakeholders. This business case for the stakeholder investment equation is straight forward:

1. Harvest period (i.e., contract length)

2. impact on performance and derived savings
3. Reward (incentive)
4. Risk (uncertainty of investment recoup)
5. Opportunity cost (the next best option for the investment)

Increasing the efficient mix of these variables leads to expanding value creation through network driven innovation. New knowledge increases the probability of improved decision. Improved link between investment decision and incentive increases the probability the decision will be resourced. The improved industry business case requires satisfying the shift from the fact “they understand a transaction base for the business side”, to a performance-oriented behavior incentivized through savings. As the potential incentive increases the network increases investment in response structures that harvest the incentive. The incentive structure positively influences decisions towards continuous value creation for the customer. This conceptualization can be illuminated mathematically through the following equation:

$$\pm D = \left[ \sum_{i=1}^n (\alpha_i R_i) * (K) \right] - \sum_{i=1}^n [\beta_i C_i] - rC_n$$

$\pm D$  = implement Decision

$R_i$  = incentive (reward) resulting from improvement decision

$C_i$  = perceived opportunity cost of investment decision

$\alpha$  = perceived value of reward discount rate

$\beta$  = perceived discount rate associated with opportunity cost

$n$  = number of years until rebaselining occurs

$rC_n$  = residual opportunity cost at year  $n$

$K$  = a dichotomous variable for the network performance goal

$q$  = the number of years the performance improvement provided benefit

The equation can also be adapted to quantify the increased performance that results from the improved reliability, repair, or supply chain management:

$$\pm D = \left[ \sum_{t=1}^n (\alpha_t R_t) + (K) \right] - \sum_{t=1}^n [(\beta_t C_t)] - rC_n + \sum_{t=1}^q (\gamma M p_t)$$

$M p_t$  = the perceived yearly value of the performance improvement

$\gamma$  = the perceived yearly discount rate associated with the improvement

Improvement through value-creating decision occurs when the potential reward for the network investor outweighs the potential cost to the network investor. The equation expresses the core variables in the performance-investment-decision-value-creation process. The process generates endogenous learning. As the incentive strategy illuminates the dynamic linkage between decision, effect, and incentive the network increases the efficient achievement of the value proposition. In this manner the dynamic network incentive provides a superior learning mechanism in comparison to the product-based contract.

As the perception of the reward occurring increases (i.e., contracts will not be canceled, and multiyear contracts are signed) the perceived risk decreases and the investment is more likely to occur. The equation accounts for increases in length of harvest season, the longer the season the more likely the investment. The investment incentive structure equations highlight the market-based prioritization of investment. The “market forces” inherently drive highest “bang for the buck” investment decisions. The equation highlights the fact that the network should look for, and is strongly rewarded for low cost or no cost performance improvement. The potential savings of harvesting is mathematically the same as potential market sales.



Harvesting is only constrained by total savings. Harvesting is easily adapted to a pure market (non DoD) application.

The incentive drives network participation. Recall earlier stories where participants stated that the desire was to more actively involve the supplier base, “they have all this knowledge.” Decreasing the barriers to supplier entry into the network potentially increases knowledge. Increasing actionable knowledge improves the solution set.

Transactions will occur where the reward / cost ratio is highest. As the network generates greater value propositions more transactions will shift from the firm to the network. Increased knowledge, increased incentive alignment, and decreased network transaction costs increases the probability of network based continuous value creation. Transactions move from the firm to the network as the network increases current and future value proposition potential. The future value potential becomes increasingly important factor as turbulence increases. The research indicates that network transactions increase in turbulent environments as the network is more capable of responding flexibly by dispersing capital risk and reducing path dependency.

In the performance-oriented network the idea of least cost bidder becomes incoherent. The value proposition inherently erodes over time. Current and future value-proposition potential therefore drives network partner selection. Each entities' value proposition is contingent upon the network structure. The value of a potential network partner is likely nonlinear due to interaction with some other network partner value proposition. Therefore there is no rational manner to pick partners based upon isolated cost structure valuation.

The second incentive, award fee, operates mathematically similar to value harvesting. The nuance is in the administration. Award fee relies on preplanned incentive and goal structure. The analysis indicated that award fee reliance diminishes as the level of performance orientation increases. The code award fee appeared less often during conversations dealing with more performance-oriented programs. In general the participants were more likely to bring up and discuss award fee on those programs that were employing a product-based strategy, a program converting a fielded system to a performance based system, or a new program without cost history.

Award fee rewards achievement of an agreed to performance goal. The program integrator evaluates the achievement of that performance goal and rewards (or not) the incentivized behavior. Incentive in this context takes on positive or negative consequences:

Most people establish metrics and they start at the top. Then you penalize the contractor on their award fee as their performance decreases based upon that top number. We're doing something totally different. We are targeting the middle. We are asking the contractor and the organic to sign up to this middle here so that you have incentives and remedies (negative incentive) under PBL. So for the contractors portion they're going to sign up at a fixed price to meet what we have here as level 5. Level 5 is the green level. At level 5 they get their fix price plus their profit for meeting that level. However you don't get any award fee for meeting that level of performance. They don't start getting award fee until it gets above the green into the blue. Then they owe us consideration if they go below the blue. That's the structure where we are targeting with the incentives. Most of the other benchmarking I've seen they start at the top and they work down. The contractor is not really incentivized to improve. They can receive 100% of their award fee by just doing their job.. And even if they don't do that satisfactory they still receive some form of the award fee

The award fee incentivizes increased performance beyond the baseline. The incentive dynamic drives improvement into the system. The fundamental difference in this strategy and the harvesting strategy is incentive administration. The potential incentive in harvesting is limited

only by the agreed to budget, the notional cost reduction, and the length of harvest season.

From a theory perspective both incentive structures provide similar relationship.

The analysis of codes and segments across the multiple programs provided both positive and negative examples of the theoretical structure of partnering incentive. The ability to mathematically display the process supported articulation of these concepts and the saturation of the category. The analysis demonstrates that incentive provides network feedback and leads to learning. The analysis revealed the structure of the relationship between the profits based feedback and the antecedents. The analysis provided an intuitive mathematical model explaining the probability the network will invest in a value generating improvement. The analysis illuminated the integral roles of the co-created value metric, the ability to decompose the metric, the integrator role in assigning accountability and the incentive-learning process. The analysis also illuminated the mechanism through which transaction value predicts which activities will occur in the network, firm, or market.

P20<sub>a</sub> Increased efficiency and effectiveness of a performance-oriented incentive structure positively influences the performance-oriented decision process.

P20<sub>b</sub> Increase in the performance-oriented mindset positively influences effect of the performance-oriented incentive structure.

#### 4.2.2.4.4 Partnering Dynamics (Network Leadership)

Network leadership establishes the governing framework, overcomes resistance to performance-orientation, and impacts the environment. Network leadership looks across the network and looks out of the network. Network leadership is distinct from the role of integration. The integrator is a key network leader however that does not restrain other entities from acting in a network leadership role. Performance-oriented network leadership requires the entity most capable of impacting the value proposition taking the particular

leadership role. Network leadership harmonizes network strategy, impacts the environment, champions the particular value network, and champions the performance-oriented approach. The performance network emerged as a collaborative and evolving partnership focused on a performance outcome. The performance-network generated a similar requirement for collaborating type of leadership.

The network leadership impacts organizations resisting the shift to a performance-oriented strategy. Similar to the differing performance-oriented mindsets within the firm, there emerged differing performance oriented mindsets among the network entities. Some organizations resist the transition to the performance-oriented network strategy. Network leadership is required to target activities to overcome this resistance:

Participant 1: You have to have from your customer leadership a desire to continue the PBL effort. If your customer isn't aligned with you and you lose your champion, then the customer kind of falls away. The customer becomes convinced PBL will work. If they're not convinced it's gonna work there is now way to push PBL through from the network side. The network can't push PBL through. And if you get your senior leaders (2-star) to push forward on both sides, then your vice presidents (4-star) will start to come on board.

Participant 2: Yes that's really what happened we had our senior lead (2 star) pushing for the PBL and there was a lot of folks at the user command (customer) who were ready to pull the plug on PBL. So it did take a meeting of vice presidents (4-stat) from the user command (customer) and network to come together and say this is a good thing and it will work. PBL has to work and here are what the benefits are.

The two participants offer insight into the role of network leadership provides moving the performance strategy forward on two different programs. Participant 1 discusses the need to keep the users (customer) at the base level aligned with the performance-oriented strategy. Alignment is the responsibility of the "champion" and "your two stars" to push the program alignment forward. If alignment does not occur the using organization will tend to revert back

to the previous condition “the user kind of falls away from it (performance-orientation) and is convinced PBL will not work.” This segment reiterates the impact the performance-orientation mindset has upon performance. The mindset leads to a self-fulfilling prophecy “convince(d) PBL will not work.” The second participant follows-up relating an experience on a different performance-oriented program. Here again the senior network leaders push the fact that the performance-oriented strategy “is a good thing and that it will work... here are the benefits.” These statements illuminate the linkage between performance orientation, change, resistance to change, mindset, and role of network leadership. The performance-oriented strategy appears more intuitive for the more senior members of the network. The network leadership (in this case senior government leaders) overcomes resistance to implementation of the performance-oriented strategy.

In the interview leadership often crossed with the code “champion.” A champion was typically a senior individual not necessarily a formal leader of the particular network who took up a network leadership role to deal with external factors negatively impacting the execution of the performance strategy. The champion acted on the environmental (institutional) factors to create a climate more supportive of efficient performance-oriented outcome achievement. A number of participants stressed the value of government champion who understood the business based dynamics associated with a performance strategy:

(Referring to a government performance champion) That leader got PBL, that leader knew PBL. That leader would go to do the things that needed to be done. And we do not have that on the government side now.....we are lacking that now on the government side.

The government champion is priceless in shaping the environment for performance-oriented success. Those on the front lines of the performance-oriented transition manifested great

respect for the government champion who “got it, knew it.” When one champion retired participants related how “we really see the value of the champion now that they have left.” The stories of champions were widespread and across many programs:

We have a senior customer who big proponent of PBL. The senior customer is convinced performance-oriented approach is the way to go; absolutely firmly committed to it. The senior customer is about to leave the program). So everyone is concerned that we're not going to see the same level of champion.

Champions arose who used their particular position to exert influence. In many cases the “champion duties” were not part of the particular actor’s official position. The eminent departure of these actors created uncertainty in the network and highlighted the importance of the champion.

The champion is not only on the customer side. One firm was undergoing a restructure of many of those “who got it.” Network members were waiting to see how the organization emerged. They were weary of the risk that performance-oriented advances would be lost. They were hopeful that the new leadership adopted a performance-oriented mindset.

The network leadership worked to overcome impact of negative perception associated with the harvesting approach to performance-oriented strategy. The network requires outyear payback to justify investments in performance improvements. The potential value of this payback shapes industry investment and potential system reliability. However there is concern that the profits achieved in out years reported as snapshots will manifest a perception that the government pays a contractor a too high margin:

Another thing is that on the commercial side of the world, if you came to me and said I want to sell you this product, and all you do is pay you this much per month, and I guarantee that this car will work for you 95% of the time, you only pay gas. You never put parts into it. You and I agree that that is a good value. You agree that value that you are giving me (price), the value that we agree upon is

fine. That you pay this amount and get this kind of value. Now the vendor says that you do not get to look at how I'm going to make that work. It is up to me to make that work. And if I can streamline and I can do that better, any additional profit I may make I can keep. Because we have already agreed that the value I'm paying you is reasonable. That is the thing that inhibits them. Because the government constantly wants to see pricing information. Our laws require the auditing agencies to make sure we are not taking them profit wise. Even though we can give them better performance, things last a lot longer, it doesn't really matter.

Interviewer: I see what you're saying as long as that perception is there, we all end up spending a lot more money, in order to ensure, we could spend less money, but it means you will allow the contractor to make so much money that we do not find it palatable.

Yes that's it, that's the key.

There is real concern that an out of context “snapshot” may make the performance-oriented program risky for the decision makers that support the strategy. Like any commercial industry the defense contractor is willing to make corporate investment with a reasonable certainty a healthy return. That reasonable certainty allows a contractor to share that risk and investment burden with other members of the network. Yet there is concern that a cost accounting approach mindset will illuminate that the contractor is “simply making too much money” regardless of the value proposition. The industry and government champions discussed how best to present the investment incentive argument in a manner which effectively addresses that perception. In general the industry value is a ratio of current positive cash flow after accounting for previous investment and necessary future investment to achieve continuous value creation. This concept can be expressed mathematically as:

$$\sum_{t=1}^n Vn_t = \left( \sum_{t=1}^n P_t + \sum_{t=1}^n B_t + \sum_{t=1}^n G_t + \sum_{t=1}^n FV_t \right) - \left( \sum_{t=1}^n (U * Uc)_t + \sum_{t=1}^n I_t + \sum_{t=1}^n \beta I_t \right)$$

$$\sum_{i=1}^N Vn_i = \text{value for the network (or firm if partial)}$$

$$\sum_{i=1}^N P_i = \text{price (or savings) harvested}$$

$$\sum_{i=1}^N B_i = \text{valuated impact on brand}$$

$$\sum_{i=1}^N G_i = \text{Valuated impact on gratification}$$

$$\sum_{i=1}^N Fv_i = \text{valuated impact on future value}$$

$$\sum_{i=1}^N (U + Uc)_i = \text{net unit costs}$$

$$\sum_{i=1}^N I_i = \text{some cost to repay investment}$$

$$\sum_{i=1}^N \beta I_i = \text{some cost to pay future investment}$$

The nation above captures the manner in which the performance-oriented strategy requires a clear explication that current profit is a snapshot and constrained by some partial differential of the cost to repay past investment and the investment in the next improvement. The senior executives discussed this conundrum in follow up meetings. They discussed the need to proactively tell the value proposition of the “performance strategy story.” The executives discussed the requirement to articulate to lawmakers the essence of a performance strategy and the value proposition for the taxpayers:

I really think that some people got the message on the government side that there is a better way to support the war fighter. And the same old transaction basis is going to give you the same old results.



Network leadership emerged the fifth and final element of partnering dynamics. The network leadership harmonizes the network orientation and acts to implement performance-oriented strategy across the network. This activity requires formal leadership and informal leadership described as “champions.” Network leadership acts to influence the environment. The network leadership picks up responsibility to explain to those removed from the leading edge of the value based economy the misperceptions with respect to performance-oriented strategy. Network leadership stands looking out and looking across the network. The network leadership orients the network to the future establishing the governing framework and impacting the environment.

P21<sub>a</sub> Increased performance-oriented network leadership positively influences the service oriented decision process.

P21<sub>b</sub> Increase in the performance-oriented mindset positively influences effect of performance-oriented leadership.

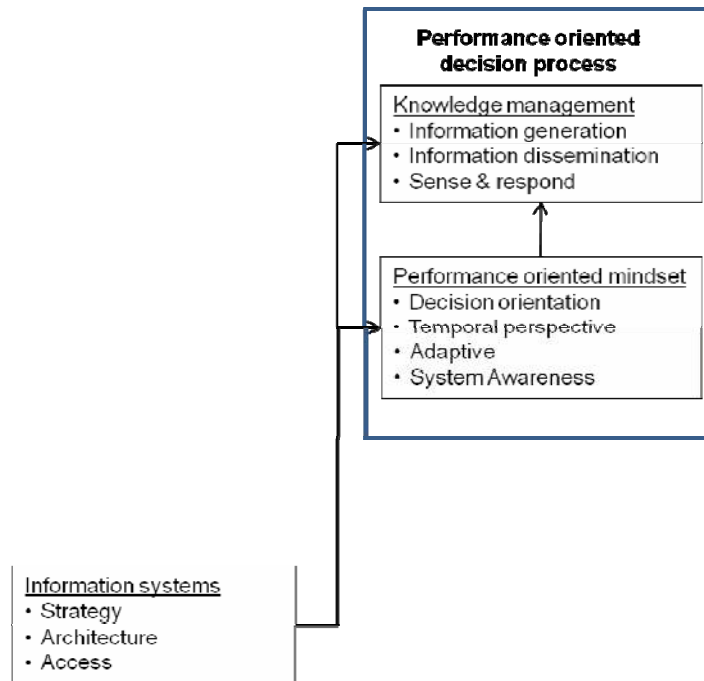
#### 4.2.2.5 Information Systems (Strategy, Architecture, Access)

The investigation revealed the significant role information systems play in the performance-oriented decision process. The analysis generated a number of codes dealing with information flow, information systems, access, software, reporting, decision support tools, data integration, intelligent agents, and other information related concepts. These codes centered on the concept of information systems. Observed meetings between customer, network partners, integrator and suppliers focused significant discussion on information system strategy, architecture, and access.

Analysis of programs at varying stages of performance-oriented strategy gave dimensionality to the information systems category. For instance one program maintained operations at a single location. For that program face-to-face communication augmented their

information systems. While another worldwide program generated tremendous volumes of information, for this program efficient flow, “gate keeping”, and use of intelligent information agents was a major focus.

Figure 13  
The Role of Information Systems



Establishing and decomposing value-based metrics involves enterprise wide information solutions. The category information system emerged three elements. The first element was strategy. The information strategy is how the information systems support firm strategy. Strategy also deals with cross network approaches to how firm information system strategies harmonize with the network information system strategies. The second element is information system architecture. Architecture is the specific information system solution and how the systems interface. The last category is access. Information access is the element of information strategy that deals with who and what information the network members will share.

The goal of the information systems in a performance-oriented strategy is to provide a “common sustainment picture.” During sustainment the integrator uses the common sustainment picture to align the overall strategy, goals, and objectives to provide the entities

the ability to optimize their discrete decisions to positively affect outcome in context to the entire network

#### 4.2.2.5.1 Information System (Strategy)

Strategy deals with how to integrate current information systems and where to take these information systems in the future. The knowledge based processes of the performance-oriented network requires a congruent information system strategy.

The investigation revealed a continuum of performance-oriented information system strategy. As programs make the initial shift from product to performance-oriented strategy managers focus their information system strategy to align legacy systems with the network goal. As programs move further into the performance-oriented continuum the strategy shifts to creating enterprise wide integrated solutions that pull information from legacy systems or completely do away with legacy systems. The more performance-oriented the leadership the more likely it is that leadership will recognize the requirement to invest in performance-oriented information system strategies. The performance oriented decision process highlights how knowledge generation requires efficient dissemination to support decision and positively influence continuous value creation.

The performance-oriented information system strategy focuses on giving the right decision maker the right knowledge at the right time. In answer to a question on what impairs transition to a performance-oriented approach one participant answered:

Not getting information structure right. Because you have to get the information flows to help understand what is going on. If I'm going to do modeling, I have to get the right information coming to me. So if I do not have that information structure working properly that helps me understand how the systems are flying so I can put that information in the model and have all the parts reacting.... that can be hurt.

This program is converting from product to performance-orientation. The interviews associated with this program revealed that the performance-oriented approach shifts from strategy of data reporting to generating flows of information that give insight into how the system is acting. The flows of information become knowledge when the decision maker senses the potential in the information with respect to the network value propositions. The manager must understand in a timely manner how the system is acting in order to know which decision to take and the probable effect that decision has on performance. The performance shift requires an information strategy enabled by decision support tools that improves network ability to convert knowledge to value.

Performance-oriented information strategy requires actionable data. The actor must be aware of the value potential of the data. The shift requires a new perspective on efficiently pushing relevant information to the right decision maker:

I spent a lot of time with the maintainers and I understand why we have the type of data that we have. Because the user motivation is to get the aircraft fixed and get it back out of there. Doing the paperwork to establish what fixed the aircraft. How much time it really took to make the fix and that kind of record keeping is difficult to do.”

The performance-oriented information strategy increases the potential value of effective knowledge generation and dissemination. Knowledge of exactly how long a repair action takes allows greater fidelity with respect to investment decisions. Investment efficiency increases as knowledge of the true cost and the true value of the investment increases.

The performance-oriented strategy requires an actionable link between the performance-oriented value metric, its decomposition, and the relevant network entity decision. This linkage requires a reconceptualization of product based information system

strategy. Those in leading edge performance networks are attempting to implement network wide architecture to support such strategy. As some participants stated, “we know what we want to do our information systems just don’t support that yet.”

P22<sub>a</sub> Increased performance-oriented information system strategy positively influences the service oriented decision process

P22<sub>b</sub> Increase in the performance-oriented mindset positively influences effect to the performance-oriented information system strategy

#### 4.2.2.5.2 Information System (Architecture)

The investigation revealed how conversion of information into actionable knowledge and then continuous value through efficient decision execution requires congruent performance-oriented information system architecture. The respondents indicated that the information required to execute a performance-oriented strategy had been available in the past. However, information system architectures did not support a cost effective conversion of that information to knowledge and that knowledge to value in a timely and efficient manner. One of the underlying enabling factors in the transition to the service-oriented strategy lay in the ability of information systems to capture, sort, and make available the vast amounts of data in timely and efficient manner. The leading edge entities adopted an information system strategy and architecture that foresaw information as knowledge and knowledge as competitive advantage. These actors leveraged architecture to increase the efficiency of the knowledge to value-generating proposition.

The move to a performance-oriented strategy draws attention to the inefficiency of many of the legacy systems. The transitioning programs spent considerable time discussing how legacy system “held back” transition to an efficient performance-oriented strategy:

And one of my biggest problems is still the data; because the legacy system is pretty pathetic data.

Interviewer: So the information systems aren't supportive of a performance strategy?

They aren't.

There is a link between adequate information system architecture and ability to execute a performance-oriented strategy. The performance-oriented program strategists discussed a requirement for efficient enterprise systems structured to harvest data value.

According to participants recent enterprise information system solutions have enabled architecture supportive of leading edge performance-oriented strategies. The investigation revealed how information strategy coupled with efficient information architecture provides the performance-oriented network an ability to co-create the value metric and then decompose that metric network wide. The modern enterprise solutions capture, sort, and make available the vast amounts of data required to accomplish this task in timely and efficient manner. The leading edge entities adopted information architectures that treat information as potential knowledge and knowledge as the source of continuous value creation.

Information system architecture enabled by decision support tools is a key aspect of this efficient knowledge to value conversion process. Performance-oriented information systems are able to model the relationship between “funding levels and optimal customer value level.” The models predict the changes funding has on “system performance.” An underpinning assumption in a performance-oriented strategy is the ability of the network to understand current system performance, generate metrics, assign reward, and continue value creation. This process requires robust information system architecture:

One of the things that we do is, for example the support equipment people. It used to be that their metric was the delivery and support of equipment and the furnishing of parts for that equipment. My metric is now the minimum amount of support equipment must be at each base each day so they can generate the right amount of flight. And at no time do I want a piece of support equipment to be a reason I cannot work an airplane. Now their metrics are tied to the aircraft. Not to the aircraft ground equipment shop.

The performance-oriented strategy requires the ability to understand the links between the discrete parts and the impact these parts have on the customer value metric. The shift to performance-oriented strategy links disaggregates piece parts, support equipment, scheduled repair, and unscheduled repair. Network success requires knowing the relationship between sub system performance and customer value metric achievement. The leading edge network members spent a significant amount of effort developing information system strategy and generating information system architecture supportive of the shift to performance-orientation. The objective of these efforts is to integrate systems across the network in a manner that generates a common information picture. That real-time common picture allows timely evaluation of how discrete decisions impact the network value proposition.

Knowledge generation and dissemination feeds the performance-oriented knowledge to value process. Performance-oriented information system strategy adds efficiency to the network knowledge, decision, and value proposition. This strategy requires robust information system architecture.

P23<sub>a</sub> Increased performance-oriented information system architecture positively influences the service oriented decision process

P23<sub>b</sub> Increase in the performance-oriented mindset positively influences effect performance-oriented information system architecture



#### 4.2.2.5.3 Information Systems (Access)

The investigation revealed that strategy and the architecture require a third aspect of the information systems to close the loop. That third aspect is access. Access requires a delicate balance of risk and reward. Knowledge dissemination over robust and efficient performance oriented architecture requires access to be actionable. Interviews revealed a great deal of government and industry thought with respect to access. The participants relayed a tension to creating the correct balance between ubiquitous information, the probability that greater access to data may lead to an improved decision and the need to safeguard certain data. There were three central aspects of access. The first dealt with nationally sensitive information. From government and industry perspective there is a tremendous responsibility to protect certain information. This requirement overrides network level efficiencies. The second access area that emerged dealt with intelligent agents “pushing” knowledge that may broaden decision maker solution sets. The last access element dealt with proprietary information. In general the performance-oriented network tended to shift the “balance” proprietary information toward greater release.

One aspect of access deals with protection of nationally sensitive technology. Some of the knowledge generated by the network is sensitive and requires limited access. The strategic object for this information is to ensure the safeguard of sensitive information while minimizing negative impact on the efficiency in the system. However, the protection of the information is of penultimate overriding concern. The network requires efficient protocols to ensure robust access to data without comprising sensitive information.

A second aspect of access dealt with pushing actionable knowledge to in a manner that gave network members insight into cross network solutions. This aspect of strategy strives to “push solutions” using intelligent agents and decision support tools to increase a relevant decision maker’s solution set. The intelligent agent searches for system trends and solutions that may provide effective resolution to similar cross network issues. For instance the agent may recognize cross network warehouse utilization solution as a template for other solutions dealing with airport ramp space or excess transportation capacities. This type of protocol requires wide access in support of unanticipated solution.

The last perspective on access dealt with release of proprietary information. In performance-oriented strategy proprietary information safeguarding presented a conundrum. In general greater knowledge dissemination increases the probability a decision will result in continuous value creation. Therefore a pure inductive argument calls for release of all data across the network. However there is a sub optimized reality that requires balance of overall network efficiency against lost reward to individual entities with respect to specific proprietary information. The performance-oriented strategy requires a reevaluation of limited proprietary information release balanced against a more general performance-oriented strategy benefits from greater information release:

We have to have knowledge of everything that impacts the system performance outcome, so that when we look at it, it is not just necessarily a number. It is here is the metric... what are the restrictors to achieving that metric? What are the things that we can control? What are the things that we cannot control? What are the worst-case resources? Are there certain resources that we need, that are going to, because of non-availability or lack of ready availability that could impact that performance outcome? What is the availability of that resource? Is it lead-time? If I am not going to get there, what is the next option? What are the restrictions the customer must figure a way around?

Multi-source knowledge generation impacts ability to generate optimal solutions. The interview segment ties together information strategy, information architecture, and access. In a performance-oriented strategy decisions are inherently dynamic, “okay here is the number, what are the restrictors?” This statement links the metric with network wide factors associated with achieving that metric. The information referred to, such as lead-time for material, is important whether or not the program adopts a performance strategy. The difference here is a more direct and dynamic focus on understanding and responding with this knowledge in an optimized link to the network performance goals. The segment reveals how information system facilitates knowledge generation and dissemination and impacts the efficiency of the decision response structure. Lastly the segment reveals the requirement for on demand access from multiple sources as the decision horizon develops. The decision maker must have information on customer performance requirements, alternative strategies, their cost, “worst case resources”, what things cannot be controlled, and how these “impact the performance outcome.” The performance-oriented strategy reveals how cross network information access positively influences the probability that a discrete decision provides continuous value creation.

The leading edge performance-oriented programs incessantly seek knowledge. They seek knowledge of customer requirement and cross network solutions. The goal in this search is to generate a response today that is more efficient and effective than the response yesterday. This search requires broad access to network knowledge. The performance-oriented solution optimizes strategy, architecture, access, and mindset toward continuous value creation.

P24<sub>a</sub> Increased performance-oriented information system access positively influences the performance-oriented decision process

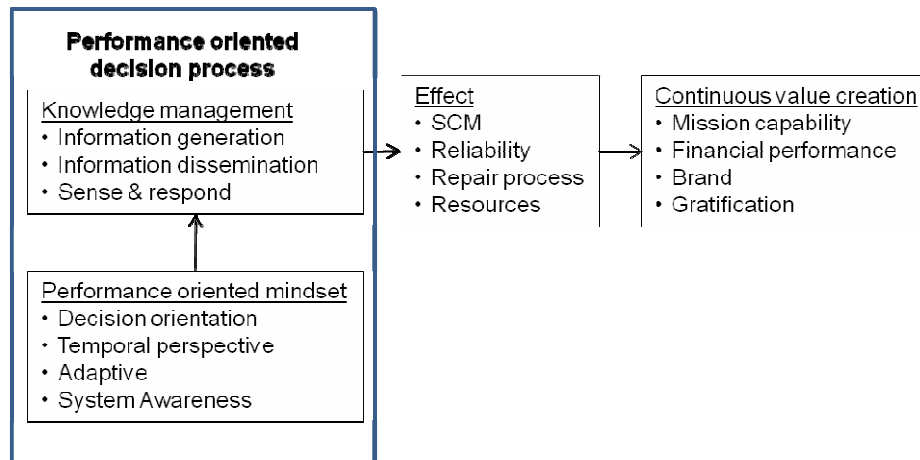
P24<sub>a</sub>, Increase in the performance-oriented mindset positively influences effect of information system access

#### 4.2.3 Performance-Oriented Decision Process: Effect and Outcome

The investigation revealed the mechanism through which the performance-oriented decision process generates value. The key insight is that a performance-oriented strategy delineates the specific effect a decision has on performance outcome from the performance outcome itself. This delineation reveals how the decision process converts knowledge into effect and how effect then generates value. The integrator captures and provides feedback on the relationship between decision, effect, and outcome.

This process provides the performance-oriented strategist the ability to judge the value of the discrete knowledge based transactions. As the value of the transaction increases in the network as opposed to the firm or the market, more transactions occur in the network. The performance-oriented strategy brings greater coherency to the linkage to the decision, effect, and continuous value creation dynamic. The clarity and coherency of the linkage increases the probability of greater generalizability of the model. Figure 14 outlines this process.

Figure 14  
The Performance-Oriented Decision Process Effect and Outcome



The two boxes on the right side of the model present a serial approach to outcome constructs. The objective of a performance-oriented strategy is to align the network to achieve improved performance. The antecedents described earlier influence the performance-oriented decision process. In the performance-oriented strategy the objective is to link and reward the relationship between the discrete decision, the effect of that decision, and the impact on continuous value creation. The efficiency and the effectiveness of that linkage improves the market place learning and competitive advantage.

The emerged performance-oriented decision process provides an explanation of how outcomes achieve greater value (increased performance or lower cost). The incentive provides judgment of the resource mix efficiency in the performance-oriented decision process. Resources expended with respect to the value generated provide a ratio of efficiency of the performance-oriented decision. The knowledge-based resource view inferred by the investigation reveals how learning through incentive enables the knowledge, conversion, value

process and leads to endogenously created value for the network. New knowledge increases the potential that the solution today will be superior to the solution yesterday.

#### 4.2.3.1 Effect (Reliability, Repair Process, Supply Chain Management, and Resources)

The evaluation of “goodness” of the decision represents the ratio of incentive to investment. The antecedents and processes of the theoretical model influence the efficiency of the decision—effect—value creation process. The investigation revealed the value producing elements of performance-oriented logistics:

Really if you're looking to reduce, or control costs for that matter (the overall goal in PBL). And the predominate cost is in repair. You can do it one of two or three ways. Either find a lower cost repair source in terms of labor rates. You find a way to improve the reliability of that part. Or you improve the repair process.

Two of the three are going to take the company knowledgeable in the design of the part to do it. The repair source aspect, it could be, if you have adequate test and repair instructions you could just hand it off to a lot of different places.

The method of improving the value proposition in a performance-oriented logistics strategy is straightforward. The first two effects were revealed as improved reliability, and improved repair process. Repair process could be improved by either reducing touch labor costs or improving the process itself. Together these improve the value proposition. This interview segment highlights the role of system level knowledge and authority as antecedents to this value creating process.

Supply chain management is the third main effect. The effect of the manager decision process to improve the efficiency of the supply chain management and impact performance emerged in a number of interviews. Efficiency of resource expenditure emerged as the fourth effect. Resource effect represents the resources consumed generating the effect. The

performance-oriented decision process is a network wide search for the most efficient mix of resources resulting in the most effective effect. Resources capture the resources added to, or consumed by, the performance-oriented decision process.

#### 4.2.3.1.1 Effect (Improved Reliability)

Improved reliability is the first effect. Improved reliability positively impacts the customer value metric, in most cases the mission capable rate. In most performance-oriented strategies mission capable rate represents the customer's sense of performance value associated with the end product. Intuitively all things static increased reliability increases overall system performance and adds to continuous value creation. Decision effects that improve customer value provide continuous value creation if the value stream of resources added to as a result of the decision is greater than the value stream of resources consumed. In general this logic can be represented mathematically as:

$$CVC = \sum_{i=1}^n VSG_i - \sum_{i=1}^m VSC_i$$

*CVC = continuous value creation*

$$\sum_{i=1}^n VSG_i = \text{value stream generated}$$

$$\sum_{i=1}^m VSC_i = \text{value stream consumed}$$

*n = time units value generated*

*m = time units value consumed*

The customer value proposition in performance-oriented sustainment strategy is improved mission capability rate and affordability. The customer is able to trade increased mission

capability for increased affordability. Again, all other things equal, increased reliability results in either greater mission capability rate or the same mission capability rate requiring less inventory and subsequent financial savings. The probability that a network actor will invest to increase reliability is proportional to the perceived incentive associated with the reliability improvement:

Interviewer: would you say that decision cycle is the core of performance-based logistics?

Oh absolutely.

But it has to, assuming that you have good in objectives to start with, the decision cycle has to link to how you reinforce behavior or incentivize behavior. One without the other, over time they will default to whatever sub optimized solution you have. And I think that is one of the challenges that is on the table. To make this really work.

Interviewer: So what does it take to get that decision cycle, what's it require?

You have to have the right incentive.... What kind of metrics do we want to use? Do they align to our objective? Or are they just what we know?

The probability of a decision to improving reliability is positively related to the “reinforced, or incentivized behavior.” Lacking the incentive the network actor will revert to “sub optimized” behavior. The implied challenge is to link effect, performance, and incentive.

Moving to the effect of the process provides an ability to use the abductive to bring structure to the emerging theory. Abductive inference “entails considering all possible theoretical explanation for the data, forming hypotheses for each possible explanation, checking them empirically by examining the data, and pursuing the most plausible explanation” (Charmaz, 2006, p. 105). This point of the emerged theoretical framework provides a mechanism to inductively check the hypotheses generated from the data. The rationality of the relationships provides validation for the conceptualization of the underlying structure. The



relationships between antecedent, process, and outcome allow for logical hypothesizing, coupled with empirical data, to propose explanation of how the theory operates. This process illuminates that the “goodness” of a decision is burdened by a partial differential of the network cost associated with the knowledge generation and dissemination, along with the cost to execute the reliability improvement. The network level potential value emerges when:

1. An entity generates and disseminates knowledge about a failure mode
2. A network entity (i.e., 4<sup>th</sup> tier supplier) generates and disseminates actionable knowledge (i.e., a new material)
3. Then this network system makes this actionable knowledge available to another actor concerned about the failure mode (1), and who has the system knowledge, authority, and response structure to impact that mode
4. That entity integrates the knowledge-based resources to resolve the failure mode
5. That resolution produces an effect that (in relation to resources consumer) results in an economically efficient reliability enhancement
6. This enhancement adds to continuous value creation

The emerging network level theory illuminates how discrete decision generalizes to the aggregate level by improving probabilities of continuous value creation. Not every outcome will be a success; however, in general the summative probability of success is increased. The same logic above applies to improving reliability, or improving the supply chain management.

P25 Increased efficiency of the performance-orientation decision effect on improved reliability positively influences continuous value creation.

#### 4.2.3.1.2 Effect (Improved Repair Process)

Improving the repair process is the second effect. The ability to improve the repair process in an efficient manner improves mission capable rate and affordability. Non-mission capable hours represent the time the aircraft is down. The aircraft may be down awaiting parts, undergoing inspection, or in repair. Any improvement to repair procedures positively influences

mission capable rate. Efficient impact on mission capable rate (customer value metric) positively influences continuous value creation.

Improved repair procedures may impact the repair of the end item (i.e., the aircraft).

The improved repair procedure can also impact the repair of the component removed from the aircraft:

And see that's what we go back to, does the technical data lead them to pull good parts? Are there problems with the technical data? The reason we are focused on this, is that every one of those boxes that goes back to the vendor cost us money (handling steps involved in that good parts trip thought the supply chain).

The user's requirements are reliable aircraft, a plane that they can go and generate flights with a minimum number of labor-hours. That's really what they're after.

Ineffective aircraft repair procedures can lead technicians to "pull good parts." The interview revealed concern that a percentage of parts removed from the aircraft and sent back through the retrograde side of the supply chain checked out good. This ineffective action may result from marginal repair procedures. Either the troubleshooting results in the removal of the wrong part or the test of the part at the vendor does not manifest the failure experienced in operation. In either case the ineffective repair procedure consumes significant resources. For instance a single failure requiring an on-aircraft repair action would impact the following cost streams:

1. Man-hours of labor to remove, replace, and operational check the system
2. Some partial differential associated with the aircraft (and support system) operation time during the system check
3. Some partial differential associated with effect on other systems, and consumables during system check (these checks may take hours and exercise the system at the edges of performance, at the aggregate this is a very real system wide cost)
4. Cost to repair the replaced part

5. Some partial differential associated with all of the supply chain activities supporting the management of the parts pulled from inventory (transportation, warehouse, loss, damage, and management)
6. Some partial differential associated with the probability the wrong part will be removed and replaced
7. Some partial differential associated with the probability that tertiary damage will occur during the maintenance activities
8. Some partial differential associated with the lost aircrew training / mission opportunity

Actionable insight into the above costs requires leading edge performance oriented information systems. The more efficient the relationship between decision to invest in the repair procedure, actual system level savings, and incentive, the more likely continuous value generated.

Improved trouble shooting procedures leads to quicker repairs and less good parts pulled.

There is a link between efficient and effective repair procedures and customer value. The customer desires both mission capable aircraft and efficiency in their man-hour use returning these aircraft to service. The incentive structure (assigning down hours to individual actors) focuses the entire value chain on that customer value. The performance-oriented strategy aligns the entire network beyond the product and toward the customer sense of value.

Decisions that efficiently improve repair procedures have a direct effect on mission capability. For instance a decision to improve technical data which results in the original failure being trouble shot quicker, or more accurately, increases mission capability. Efficiently achieved increased mission capability adds to continuous value creation. Further, serviceable parts not sent back through the repair pipeline adds a significant value. An example of this process with respect to second order value generation is:

1. Knowledge generated (availability of a training class to improve troubleshooting) and disseminated to an actor with the authority to send the right technician to the class that
2. Results in a decision (such as sending the employee to the class)

3. Increases the probability that all future repair activities accomplish by that technician will result in greater repair efficiently,
4. The effect (decision to send the technician to class) positively impacts continuous value creation

The decision to send the technician to class converts money into technical skill. That skill provides potential “effect” at some time in the future when the technician’s activities improve mission capability in an efficient manner.

Decisions that improve the repair process in an efficient manner impact the mission capable rate. The increase in mission capable rate provides for continuous value creation. Network wide knowledge generation and dissemination influence decisions that improve the repair process. Improved repair process contributes to meeting the customer value proposition and continuous value creation.

P26 Increased efficiency of the performance-orientation decision effect on improved repair processes positively influences continuous value creation

#### 4.2.3.1.3 Effect (Supply Chain Management)

The third effect is supply chain management. Improved supply chain management increases the mission capable rate and positively impacts the affordability of the program. Supply chain management deals with the efficient flows of goods, services, and information in the pursuit of continuous value creation. In a performance-oriented sustainment program supply chain management seeks to ensure that the right parts are at the right location at the right time:

One of the system availability metrics has two aspects to it. It has the supply-chain aspect. But the metric also has a design aspect of it. So if we are going to increase performance, you have to give us a reliability improvement curve. You have to have that (as a) design element of their metric, or they could just filled the supply-chain with parts.

Supply chain management impacts the customer value metric. The network can improve mission capability inefficiently by saturating the supply chain with parts. The increased parts availability leads to the end item returning to service quicker. However that solution does not address underlying reliability. Additionally the parts still require repair and handling. Performance-oriented supply chain management requires a balance. The parts that saturated the supply chain results in parts that someone must repair. The larger goal is to optimize supply chain management while continuously seeking to improve overall reliability.

Supply chain management optimizes the aggregate performance by using knowledge to ensure that the right mix of reliability, spares, inventory levels, transportation, and warehousing:

In the supply chain management metric we are grading our suppliers on how well they produce, and provide their piece parts to the customer. The principal metrics that we came up are parts that results in an aircraft being grounded. The other was total number of hours an aircraft is grounded due to lack of parts.

The performance-oriented supply chain metrics focus on having parts available to address grounding conditions. Supply chain management proactively optimizes the mix of parts to forecast and immediately fill demand as required. The second goal is to focus the network supply chain activities on bringing a grounded aircraft back up.

In general the more advanced performance-oriented strategies assume an efficient supply chain management. These programs focused more on improved reliability and repair. The programs transitioning from a product to performance orientation spent more conversational time on supply chain management improvement. This makes sense as these two approaches leverage current resources to generate the highest potential continuous value. The more advanced program focused on leveraging their network design toward more efficient use

of knowledge and skills to improve repair and reliability. Parts that do not break do not consume costs. The less advanced programs tended to have greater relative knowledge and skill with respect to impacting the flow of parts through repair facilities and improving overall logistics efficiency. In either case the use of incentive structure focuses the network on efficient supply chain structure to ensure continuous value creation through either supply chain management or improved reliability and repair.

P27 Increased efficiency of the performance-orientation decision effect on improved supply chain management positively influences continuous value creation.

#### 4.2.3.1.4 Effect (Resource)

Decisions to increase reliability, improve repair processes, or improve supply chain management entails consumption of resources. Actionable knowledge generation and dissemination increases the probability that decisions will increase customer value (mission capable rate) and increase affordability. Effect on resource captures the impact the decision has on taking from or adding to resources. The research emerged an axiom associated with the decision process and resources. The greater the congruency of the incentive, antecedents, and outcome, the more probable the decision will result in continuous value creation. Continuous value creation is the aggregate measure of resource efficiency conversion. The efficiency of the resource conversion supports the contention that increased knowledge should lead to a solution today that is more optimal than the solution yesterday.

P28 Increased efficiency of the performance-orientated decision process impact on resources positively influences continuous value creation.

#### 4.2.3.2 Continuous Value Creation (Mission Capability, Financial Performance, Brand, and Gratification)

The investigation revealed four outcomes of the performance-oriented model. These are (1) measure of customer value, (2) network actor financial performance, (3) brand, and (4) gratification.

The outcome of a performance-oriented strategy is the creation of continuous value. This is distinct in two respects. The first is that the performance-oriented strategy maintains a “continuous” dialogue between the network actors, the integrator, and the customer. The second distinction is that the performance-oriented strategy embraces an evolutionary approach to value creation. The performance-oriented strategy recognizes that the product is merely the vehicle through which the network meets customer performance requirements. The network uses knowledge to improve the probability that the performance-oriented decision process will increase performance and value over time. The performance oriented decision process results in continuous value creation:

So your business decision cycle, and you're performance incentives, and you're performance outcomes have to be aligned. So if you can align those three things, your chances of success are multiplied immensely. So your decision cycles, and what you reinforce, and what you are trying to achieve are all aligned with an output type of metric. As opposed to some of these sub metrics, the transactional ones. Then you can optimize toward the end result that you really no kidding want.

The essence of performance-oriented strategy is “alignment of decision cycles, what you reinforce, and what your are trying to achieve” to generate what the customer “really no kidding wants.” Network alignment through continuous value creation removes transactional strategies. Continuous value creation is a performance-oriented construct. The construct rests

on the realization that value propositions are inherently dynamic, that knowledge provides an ability to evolve the performance value. The relationship between any network entity and the end customer moves beyond discrete transaction and toward continuous value.

Increased efficiency in the conversion of knowledge to value is the alchemy of performance-orientated logistics. The underlying hypothesis is that efficient introduction of new relevant knowledge to an actor generating a decision (converting knowledge to effect) increases the probability that the decision will be more efficient and effective than all previous decisions. This systems dynamic results in endogenous growth. Performance-oriented sustainment effect impacts four types of value. These are mission capability, financial performance (profit for industry, affordability for the customer), brand, and gratification. Greater alignment of the incentive with effect on value improves the overall efficiency of the network economy.

#### 4.2.3.2.1 Continuous Value Creation (Mission Capability—Customer Value)

The network accomplishes continuous value creation by providing a product and product support that continuously meets an evolutionary value proposition. The knowledge enabled structure of the performance-oriented network promises increased value over time. The performance-oriented logistics network generally captures customer value as mission capability. A significant task in a performance-oriented network is the creation of a value metric that is both tangible, decomposable, and efficiently captures the customer sense of value:

Metrics have to be part of the entire equation that helps you define what your entire architecture is. It is really putting down in numbers what your customer wants performance to be... And so it provides a guideline to help develop the architecture as you go forward. So to me metrics are parameters by which you are able to set up your infrastructure, and meet the needs of what your customer is asking for.



The value metric is the link between network activities and customer perception of performance “to be met.” The challenge is getting “down in number what your customer wants.” This is a significant and critical task; the metric is what translates the customer sense of value into “parameters by which you are able to set up your infrastructure (network), and meet the needs of what your customer is asking for.” There is an implied continuous co-management, “what you’re asking for”, the phrasing indicates a future oriented dynamic process. The co-managed performance-oriented network is anticipatorily. Metrics align the network architecture to accomplish an evolving goal.

The metrics focus system level awareness through the performance mindset so that the sums of the discrete decisions increase overall value:

The system metric may be influenced by sustaining engineering, by supply chain, by the information technology community, by the software community and so forth. That is where we have our decomposable metric and that is where we are trying to create increased performance. We are saying okay as you develop a subsystem metric we will allocate performance to that metric. And we will develop a model that will do that. Now that is a little more complex than this simple explanation. Now the suppliers have a decomposed part of the metric they can play with.

The achievement of dynamic outcomes requires alignment of the supply chain, IT, software, and enterprise solutions. These structures provide the ability to decompose the metric to the appropriate subsystem. The integrator assigns a performance outcome value to each subsystems based upon the decomposition. This is “a little more complex, than this simple explanation” generation of metrics; decomposition of the metric and transparent incentive structures requires a robust “model to do that.”

The metric is a tangible value that forms a link between the performance-oriented decision process and customer perception of value. The metric is what focuses the network

activity in a performance-centric strategy. The metric represents the accomplishment of two significant tasks. The first task is for the network to co-create a metric that efficiently capture customer value in a dynamic sense. The network efficiency increases as the gap between the metric and true sense of value decreases. The “true” customer value is assurance that the aircraft is ready to do the required mission when required at an affordable cost. The network agrees that the mission capable rate is a reasonably acceptable measure of that value. Second the metric must be actionable. The metric must be decomposable in such a manner that the disaggregate parts can be understood, flowed down, and incentive assigned in a way that leads to improvement:

A performance-oriented supplier is the ones that we are flowing performance down to, metrics down to..... we apply an incentive strategy that is surrounded by a certain number of performance metrics that supplier has to comply with. It is almost at pass through down to that subsystem. But we hold the responsibility of looking at it always from an enterprise perspective.

The network continuously monitors and decomposes the metric. This decomposition process assigns and incentivizes the piece parts in a way that considers decisions “always from an enterprise perspective.” The more efficiently the decisions are generated from the enterprise perspective the greater the probability that the effect will result in continuous value creation. The focusing on the “enterprise level” emerged as a significant element of integration.

In the performance-oriented decision process effect is an instrumental connection between decision and outcome. The effect provides a tangible link between decision and some measure of performance. The congruency between the measure (largely mission capable rate) and the true (and evolving sense of value in consumption desired by the participants efficiency of the process impacts the efficiency of this process. The performance-oriented decision

process recognizes the non-static sense of customer value. Increased network awareness of the true source of value and an increased awareness of how actionable knowledge increases the probability that decisions will result in an effect that generates continuous value creation.

P29 Increased insight into the effect of performance- oriented decision process has upon the customer value metric positively influences learning.

#### 4.2.3.2.2 Continuous Value Creation (Financial Performance)

The ultimate goal of the performance-oriented strategy is to increase financial performance. The structure of the performance-oriented decision process generates effects today that are superior to effects yesterday. Superior effect requires new knowledge of solutions or new knowledge of customer sense of value. The goal in a performance-oriented strategy is not return to specification. The goal is decisions that result in increased reliability, that improve repair processes, and generate more efficient supply chain management at a reduced cost. The greater the achievement of that goal the more likely the network will benefit from improved financial performance.

For the customer the underlying structure of a performance-oriented approach promises to improve the long-term affordability associated with the system. The performance approach establishes a paradigm where potential future savings become an incentive for network partners to invest to achieve cost saving that would otherwise have gone unharvested. For the network the incentive structure rewards industry improvements in reliability, repair, and supply chain management. Over the long run re-baseline of the program cost improves the overall affordability for the customer. For industry financial performance occurs when decision to invest generates incentive:

But what you want to do is you want to incentivize the supplier to make their product better. Which today most of the world is based upon return on sales, not a return on investment. So you get them to shift their business model from a return on sales to a return on investment.

The performance-oriented approach shifts the mindset to induce behavior that “makes the product better.” The performance oriented approach “shifts from a return on sales to a return on investment.” The network partners make decisions to invest against ability to harvest savings. The network partners achieve return on investment because it is likely that increased knowledge generated and disseminated will positively improve the probability that a decision will result in efficient impact on the customer value metric as evaluated against incentive.

Recalling the earlier equation associated with decision of network to invest capital (or some other decision) under a “harvesting approach” to savings. The equation can be modified to include a factor that accounts for tangible benefits derived from the performance-oriented decision. In its simplest form the overall financial performance of the network is the sum of numerous discrete decisions over the life of the program. The overall system (performance logistics) affordability increases for the customer as reliability improvements affect mission capability, and as the overall system cost is rebaselined. This can be efficiently represented mathematically as:

$$\pm D = \left[ \sum_{i=1}^n (\alpha_i R_i) * (K) \right] - \sum_{i=1}^n [\beta_i C_i] - rC_n + \sum_{i=1}^f (\gamma M p_i)$$

The equation is modifiable to include a factor accounting for any perceived performance improvement associated with the network decision (repair improvement, reliability enhancement, or supply chain management improvement). The resultant equation represents

the theoretical balance of resources with respect to outcomes of the performance oriented decision process:

$\pm D$  = implement Decision

$R_t$  = incentive (reward) resulting from investment decision

$C_t$  = perceived opportunity cost of investment decision

$\alpha$  = perceived incentive discount rate

$\beta$  = perceived opportunity cost discount

$n$  = number of years until rebaselining occurs

$rC_n$  = residual opportunity cost at year  $n$

$K$  = a dichotomous variable for the network performance goal

$q$  = the number of years the performance improvement provided benefit

$Mp_t$  = the perceived yearly value of the performance improvement

$\gamma$  = the perceived yearly discount rate associated with the improvement

The general impact of a decision becomes a ratio of the effect of the decision (outcome) against the efficiency of the decision. The network financial performance can be expressed as the efficiency through which the network converts knowledge into value. This conversion ratio represents the efficiency of the effect has on value versus the value of resources consumed. For the individual firm the value is the current and potential future return on investment associated with resource expenditure and continued membership in the network.

The knowledge based evolutionary solution potential generates an expectation of increased reliability and lower cost. One question that came up was “why didn’t this performance-oriented approach emerge before?” The analysis indicates that the

performance-oriented strategy has emerged from a cross roads of a number of variables. These variables are efficient network level information systems, recognition of knowledge and skill as a key resource for continuous value creation, the raise of effective supply chain management constructs, and an ability to generate and decompose customer perception of value. There are also environmental fiscal realities the requires sustainment programs focused on more long-term affordability.

The investigation revealed an underlying logic that activities that generate increased actionable knowledge and align network incentive promise to increase the investment in future savings. Further increased efficiency in network knowledge based transactions lower cost and improve value. The performance-oriented strategy generates new value as long as the value stream of the associated activities is greater than the cost.

P30 Increased insight into effect of performance-oriented decision process on financial performance positively influences learning

#### 4.2.3.2.3 Continuous Value Creation (Brand)

The analysis emerged two less tangible, yet real outcome variables. These variables are brand and gratification. The performance-oriented strategy increases the perception of brand value and the network entities' gratification associated with being part of that performance outcome.

For some entities the "brand" associated with the system performance outcome represents something of value. The performance-oriented "brand" acts as an incentive and aligning force. Organizations were proud to be associated with performance outcome of these systems. This was particularly true for the prime contractor who designed these systems:

Any bad press we get kills us (associated with system performance). We hate it. It is amazing how much we hate it....it is amazing what motivates a contractor. Some think that if you're not making extra money off of it, you're not making big profit off of it, you're not motivated. That's not true.

I am here to tell you that there is a lot of pride in the product. There is a lot of concern about selling all of our products. And firm ZZZ is a label. It is a brand and the quality is very important. I'm not preaching here. This is a true statement. The problem I have is that people, a lot of them on the customer side don't believe it. They asked why would you be that way?. And the reality is I want to see this system succeed as much as I can.

The participants routinely label the performance outcome as “brand”, “it (the system) is a brand and the quality is very important.” There is a pride associated with the end performance that transitions beyond delivering a static product, “and the reality is I want to see this system succeed as much as I can.” The use of the phrase “system succeed” is insightful. The participant focuses beyond the product to the system performance based upon the actions of the overall network. This system performance is dynamic; the expectation is there will be continuous value creation. The perspective is that action will continually impact the network value proposition. The system succeeds by generating value in use. This “brand” associated with the performance outcome impacts “all of our products.” The participant indicates that a “lot of them on the customer side don’t believe it”, “it” being the loyalty to the “brand.” The phrase reveals an undercurrent of tension from a product or transaction past. The relational aspects of co-management of the performance-oriented strategy inherently address this tension. The network entities are ultimately obligated to the network shareholders and financial outcomes yet they are drawn by their own “brand.” The performance-oriented approach represents a method to optimize both shareholder and customer sense of value.

The brand associated with the mission and positively impacting the customer value metric is tangible, and something the leadership capitalizes upon:

The mission focus pays off with people who are focused on first-time quality or focused on doing the job right. They understand that it really relates to the customer. So we continue to kind of capitalize on that emotional investment and appeal to people doing the right thing because there are people involved that you are protecting. Because they are identifiable, and what you do, and their protection translates directly to the quality of the work you do.

The performance-orientation “pays off with people who are focused on first-time quality, or doing the job right.” These people associate brand and “mission”; that association motivates them to ensure network success. There is an “emotional appeal” and that emotional appeal relates to customer co-management because “their protection translates directly to the quality of the work you do.” The performance-oriented approach relies on incentive as the primary network level driver to influence behavior. However there also exists an intangible element associated with the mission, being part of the system, being associated with the brand that impacts the performance-oriented mindset and is impacted by the performance-oriented mindset.

The link between mission (or satisfying the customer value metric) and brand generated a number of questions that required theoretical sampling. The curiosity surrounded whether this “brand” satisfaction was unique to a performance-oriented strategy dealing with “high profile” systems. The question was whether the brand value associated with the particular system or as indicated by the analysis was the brand value associated with the performance outcome:

Interviewer: Back to this idea of, you are talking about, folks identify with the XYZ system and its mission. Do you think that same sort of identity can occur with other less sexy systems?



The identity idea we were just talking about, it can occur with anything. It is recognizing what the customer wants. The best way to ensure the customer is happy is to be responsive to what he's asking for. That translates whether it's a jeep, a truck, a helicopter, or an airplane...it's easier to capitalize on if it's only that XYZ weapon system, but it is not going to be culturally transportable...if you if you can make the focus the customer then that translates across anything, whether it be hamburgers automobiles, or XYZ system.

This brand identity is not associated with the particular, "sexy", weapon system, but the ability to focus on "what the customer wants." The sexy systems are easier to focus on but that construct is limiting and "not culturally transportable." If you make the brand "the customer (source of value) then that translates across anything, whether it be hamburgers, automobiles, or..." The performance-oriented strategy captures and capitalizes on the clearly articulated link between decision, effects, and performance outcomes. This association with the performance generates intangible, intrinsic value:

Interviewer: Is there an intrinsic value associate with the award fee (a small amount)?

No, none what so ever.

Interviewer: How about intrinsic value associated with the mission?

Oh absolutely! You kind of have to look at the world a lot of the logistics people come from. They come out of the operational world, and they had that very strong mission orientation and it is contagious.

The "esprit de corps" associated with the outcome is greater than some measures of financial incentive. The mission orientation associated with the network brand influences the performance-oriented mindset and "it is contagious." Performance outcome inherently transcends the organizational boundaries:

In my opinion, for the contractor the XYZ system is their goal. Their focus, what they're doing, and what we're doing is supporting the mission. There is a focus on the mission. It's not a contractor government. It's an XYZ system

arrangement, marriage, relationship, whatever works, whatever words you want to use. And their goal is support the mission.

The relationship “it’s not a contractor-government., it is a network arrangement, a marriage, relationship, whatever works, whatever words you want to use, and their goal is the mission” the overall network brand. The mission is distinct from the metric. The metric is the agreed to “number” that represents the desired value. The actual mission may be the more “true representation” of the customer value, and the network orientation to that mission. Overall there is a tangible value associated with the network performance-oriented brand. The brand increases the value potential associated with being part of the network. Understanding the discrete influence individual decisions have upon the brand and the incentive associated with those decisions positively influences network learning.

P31 Increased insight into effect of performance-orientated decision process on the network brand positively influences learning.

#### 4.2.3.2.4 Continuous Value Creation (Gratification)

The investigation found gratification as an element related to brand but distinct from brand. For some participants the move to the performance environment is empowering and liberating. For these individuals the ability to transcend one’s own “compliance mindset” and the “compliance mindset” of the organization brings immense gratification. The underlying excitement associated with this liberating sense comes through in the next story:

The approach I use when they say I have to follow the process, I say you show me where the value added is and I will follow it. Otherwise I am the program manager, I am responsible for cost schedule and performance. ...that is because I am a risk taker, I am a decision-maker. I don't have a problem with that, that is the way I live. That is why I am where I am. I say this is performance-based logistics the regulations just haven't caught up to it. (Regulations) haven't caught up to the concept yet....in two or three years there will be exceptions to that in the Federal Acquisitions Regulations that says you do not have to do that. In the

meantime if you cannot show me that what you are doing is a value add. I am going to write you a memorandum of understanding that says you are no longer going to do the non-value added task...

A telling line in this segment captures the gratification associated with moving to a performance-oriented strategy, "I say this is performance based logistics the regulations just haven't caught up yet." The segment reveals that some of those at the leading edge of the shift recognize the shift and realize the institutional constraints "haven't caught up to" the performance-oriented way of thinking . Some transition easily to the new paradigm. They quickly adopt a performance-oriented mindset, "I am responsible", "I am a risk taker, I am a decision-maker", "that is the way I live." The performance mindset may be something of a way of life. This participant has landed squarely in the "new paradigm." This participant saw the new paradigm coming; waiting a career to be able to say "you show me where the value added is, and I will follow it", otherwise "this is performance base logistics" and "I will write you a letter that says you are no longer going to do that non-value added task on my program." Because "that is the way I live" because that is the way I live is a powerful and revealing statement about ones workplace sense of gratification. This participant has shifted to the new paradigm with ease, others interviewed emerged right beside him. The ability and authority to operate in performance-oriented environment generates palpable gratification for these entities. Still others hold firmly to the power granted them by their "illities", their functional focus, or their sub-system optimization. For those there is no gratification in the new paradigm. The significant task of the leadership is to ease their transition in an efficient and non-destructive manner.

This emerged relationship between attraction to observable outcome and gratification is interesting. The performance-oriented strategy appeared to generate a gratification that transcended organizational boundaries. In a number of cases individual stated that they found identity with the program and goal achievement more satisfying than they did their relationship with their organization. From an industrial-organizational psychology perspective this is very hopeful. As firms deconglomerate and focus on performance outcome this performance-oriented gratification may manifest network loyalty that might otherwise be lost through outsourcing. The more tangible the effect of a decision on the performance outcomes the greater the sense of gratification for both individual and organizational actors associated with the network performance outcome. The more direct the link between gratification and impact on outcome the greater the learning.

P32 Increased insight into effect of service-oriented decision process on gratification positively influences learning.

#### 4.2.4 Pulling the Grounded Theory Together

Figure 5 illustrated the grounded theory of performance-oriented logistics. The use of the framework provides insight into how effect (profit signal) influences antecedents to generate learning. The profit is feedback associated with the continuous value creation (financial, performance, brand and gratification). The framework relates the antecedents (integration, environment, leadership, partnering dynamics and information systems) to the central decision process of a performance-oriented strategy. The central process is composed of knowledge management and mindset. The performance-oriented decision process creates an effect that leads to continuous value creation. The theoretic framework fulfills the task to “seek causes, favors deterministic explanation, and emphasizes generality and universality” (Charmaz,

2006, 126). Table 14 presents the guidelines followed in the analysis to ensure that the grounded theory was inductively and abductively “pulled together.”

Table 14  
Pulling the Grounded Theory Together (Charmaz, 2006, p. 155)

Are the definitions of major categories complete?
Have I raised major categories to concepts in my theory?
How have I increased the scope and depth of the analysis in this draft?
Have I established strong theoretical links between categories and between categories and their properties, in addition to the data?
How have I increased understanding of the studied phenomena?
What are the implications of this analysis for moving theoretical edges?
For its theoretical reach and breath? For methods? For substantive knowledge? For actions or interventions?

The previous explication of the theoretic categories and their relationships accomplished the tasks in table 15. Table 16 provides the definition of the major categories. The grounded theory raised the major categories to concepts, and related those in a theoretic structure. Figure 5 lays out the theoretic relationships pictorially; section 4.2 of the analysis explicates the construct definition and relationship. The analysis used rich empirical data, supported by qualitative software analysis, to “establish strong theoretical links between categories, and between categories and their properties” (Charmaz, 2006, p. 155). The inductive approach, coupled with subsequent member checking provides robust support for the findings. The grounded theory provides an inductively logical understanding of the studied phenomena of performance-oriented strategy. The method and analysis represents a robust, and well-documented approach to grounded theory in the fashion of Glaser (1978, 1992) and as instructed by Charmaz (2006). This approach is well suited for use in business related research.

The analysis next moves to assess the fundamental premises of S-D Logic, and the S-D Logic debate.

Table 15  
Definitions of Major Categories

Performance oriented decision process	The process of knowledge generation, dissemination, and response that produces a measurable effect upon continuous value creation. The entity inclination to sense and respond in a performance-oriented fashion is impacted by the performance-oriented mindset.
Knowledge management	The generation of actionable knowledge and dissemination of that knowledge to an entity inclined to sense that knowledge and respond in a manner that leads to continuous value creation.
Performance-oriented mindset	The inclination to sense and respond through an entrepreneurial decision orientation. The ability to adopt a cross-temporal search for knowledge and awareness of long-term consequence of response. The ability to adapt new knowledge to a more optimal response that maintains system level awareness.
Integration	The process of network entrepreneurship. Integration efforts improve the efficiency of transaction value in the network as oppose to the firm or the market. Integration provides the network with total system knowledge; integration requires authority and the ability to manage the network.
Environment	Those extra-network factors that act to influence network outcomes. The environment is composed of institutional factors, financial policy, supplier base, and perception.
Leadership	Performance-oriented firm leadership acts to influence the performance-oriented mindset, define firm strategy in harmony with network strategy, and resource competencies likely to improve the firm's network value proposition.
Partnering dynamics	The intra-network relationships. Partnering dynamics impact the firm's optimized network value propositions. The performance-oriented network requires a robust ability to co-manage value proposition. The achievement of evolutionary outcomes requires dynamic assignment of role and responsibilities. The establishment of clearly explicated incentive structure generates network learning and continuous value creation. The network leadership acts to impact cross network factors in support of continuous value creation.
Information systems	The knowledge based performance-oriented network view requires enterprise wide information solutions. The information system strategy, architecture, and access require optimization toward efficient and effective generation and dissemination of actionable knowledge.
Effect	The tangible output of the performance-oriented decision process. Effect

	forms the link between discrete network activities and continuous value creation.
Continuous value creation	The measure of network knowledge-value conversion efficiency.

Does PBL provide a rational sample from which to evaluate S-D Logic? The structural phenomena driving the shift to a performance-oriented approach (Cipicchio, 2006) are strikingly similar to those articulated as driving an S-D Logic reconceptualization of the market (Vargo and Lusch, 2004a). The use of a supply chain management makes sense. Rust (2004) sees in the S-D Logic evolution a growing symmetry linking marketing and supply chain management. He argues business to business marketing as a leading edge source of many new marketing variables “due to its relationship intensiveness and its customer databases” (Rust, 2004, p. 25). The key attribute emerging in B2B is the ability to convert information to knowledge and effectively manage relationships. Rust (2004) asserts that the primary reason for the shift is information technology and its ability to “understand and enhance customer relationships” (Rust, 2004, p. 25). Rust (2004) believes that supply chain management provides significant validation of S-D Logic. He believes the information and knowledge intensive demands in supply chain management provides a leading environment emerging an S-D Logic like structure (Rust, 2004). Marketing is entering a new era one that is well articulated by S-D Logic. This era will closely “resemble the business-to-business/service/relationship marketing of today” (Rust, 2004, p. 25). The performance-oriented grounded theory emerged in a supply chain management setting, one rich in customer co-management phenomena provides a firm foundation to inform an assessment of S-D Logic.

The grounded theory investigation into the 100 billion dollar a year performance based logistics market segment emerged a theoretical model of the performance-oriented network.

The next section uses that model to inform an assessment of S-D Logic. This assessment also evaluates the congruency of the performance-oriented network theory and S-D Logic. That foundation provides a basis to then propose the structure and relationships of a model congruent with S-D Logic conceptual content.

#### 4.3 Analysis: Grounded Theory Informed Assessment of S-D Logic

The second section of the analysis turns back to the S-D Logic literature. In this section the emerged performance-oriented grounded theory provides an empirical foundation to assess the fundamental premises of S-D Logic. Following that the performance-oriented grounded theory informs an assessment of the more general debate surrounding S-D Logic. The analysis focuses on the boundaries, limitations, and extensions of S-D Logic through an assessment of its fundamental premises, and the debate surrounding S-D Logic. The analysis targets insight into five key dimensions:

1. Identify boundaries, extensions, & modifications
2. Provide insights
3. Empirically confirm arguments
4. Empirically disconfirm arguments
5. Inductively develop theory of S-D Logic
6. Constructs, relationships, and outcomes
7. Coherency with the S-D Logic literature

The analysis inductively generated a performance-oriented theory of the network. This network is focused on continuous value creation and enabled by knowledge. S-D Logic is a similar network level framework whose objective is a service outcome.

##### 4.3.1 Service and Performance

Service as defined by Vargo & Lusch (2004a) is a conceptually similar construct to performance. The grounded theory sample defined performance as a shift from providing



product to providing an evolutionary sense of value, a sense of continuous value creation through sustainment. For the practitioners the term performance made sense and was recognizable. The analysis revealed the practitioners imbued the term performance with similar conceptual and theoretic content as Vargo & Lusch (2004a) imbue the term service.

The practitioner's performance-oriented network focuses on the ability to meet some agreed to performance requirement of the customer, the product is only one element of that performance solution. The performance metric is that link between network activities and customer source of value. The idea of performance is non-static and establishes a rational expectation that the network, through new knowledge conversion, will continually increase performance. The performance network strategy rests on inherent cost and performance curves that anticipate the fact that customer sense of value will evolve (that is the static will erode) over time.

The conceptualization of performance is therefore similar to if not the same as Vago and Lusch's (2004a) conceptualization of service. For Vargo and Lusch (2004a, p. 3) service is "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself." This is coherent with the activity and definition the research participants imbued in the term performance. Performance is the practitioner term associated with the emerging S-D Logic like phenomena in the sustainment industry. Performance represents the customer's perception of value. Performance is not a value added term; performance is what the good and associated services accomplish. Performance recognizes goods and services and subsumes them. The practitioners

define performance as a knowledge enabled source of superior financial gain that leads to an evolutionary potential for continuous value creation.

According to Vargo & Lusch (2004a, p. 3) service should not be equated with “(1) the restricted, traditional conceptualizations that often treat services as a residual (that which is not a tangible good; e.g., Rathmell 1966); (2) something offered to enhance a good (value-added services); or (3) what have become classified as services industries, such as health care, government, and education” . In a service-oriented logic: 1) knowledge is the source of competitive advantage, 2) efficiency is achieved through optimizing relationships benefited by knowledge competency, 3) customers are co-producers of competitive offerings, and 4) financial performance is driven by endogenous growth (Vargo and Lusch, 2004a, p. 5). Thus, the service-oriented view comprehends the goods-centered view as a specific and limited case. Furthermore, S-D Logic is coherent with resource-advantage theory and core competency theory (Hunt, 2000; Prahalad and Hamel, 1990; Vargo and Lusch, 2004a).

The performance oriented grounded theory emerged, like S-D Logic, as a highly knowledge and skill oriented model; that is an operant oriented model. Operant resources form the fundamental value generation potential of the performance –oriented network theory. In that theory the knowledge-decision-conversion process relies on knowledge based “resources that produce effects” (Vargo and Lusch, 2004a, p. 2). Performance is the measure of value as achieved through the decision enabled effect. This next section presents an assessment of each fundamental premise of S-D Logic.

#### 4.3.2 Assessment of the Fundamental Premises of S-D Logic

The performance-oriented grounded theory provides an inductively generated theory emerged from a segment of the market conceptually equivalent to the environment suggested by S-D Logic. The literature review in chapter 2 laid out the similarity of premises surrounding S-D Logic and PBL. During that review PBL emerged as a sample rich in S-D Logic like phenomena. The primary objective of the grounded theory is to provide an empirical method to inform an analysis of S-D Logic. This section now uses the performance-oriented theory to inform an assessment of the fundamental premises of S-D Logic. The section presents the fundamental premise and then uses the performance-oriented grounded theory to inform an assessment of each premise.

The foundation proposed by S-D Logic emerged highly coherent with the substantive area of PBL. The study of entities making the shift from product to service (performance) oriented strategy provides a theoretical understanding of the underlying shift occurring in such market segment. The complex adaptive systems represent a theoretical structure that appears highly consistent with the framework posited by S-D Logic. The grounded theory now provides empirical support to inform assessment of the literature dealing with S-D Logic, the fundamental premises of S-D Logic.

The analysis began with an objective to provide insight into the boundaries, limitations, extensions, and insights into S-D Logic. S-D Logic is a conceptual framework one which may provide a foundation for a new theory of marketing and lead to a new exchange paradigm (Lusch and Vargo, 2006b). This is a broad mandate. However if S-D Logic is to fulfill such a mandate then any boundaries identified at this point in the paradigmatic shift cut that mandate

short. S-D Logic is not a theory yet, but a framework and possible new paradigm. As such, boundaries that result in limitations or extensions would logically identify a “new S-D Logic”, that is a different new framework and a different new paradigm. On the other hand if there are no boundaries yet identified than there can be no limitations and extensions.

The literature debate discusses a number of concerns with S-D Logic. In general the empirical assessment of S-D Logic found support that in some cases Vargo and Lusch did not mention explicitly how S-D Logic handled certain phenomena such as cash flow (Ambler, 2006; Lehmann, 2006). However that is different than saying S-D Logic as a new paradigm does not address issues such as cash flow. Page count and imagination limit Vargo and Lusch’s ability to provide a proactive explanation of S-D Logic versus all conceivable conditions. The question is not did Vargo and Lusch mention something, the more rational question is asked of S-D Logic. Does the Vargo and Lusch conceptualization of S-D Logic explain these phenomena? If so than those phenomena do not illuminate an S-D Logic boundary.

The critical step is then the why and the how of S-D Logic (Hunt and Madhavaram, 2006). If S-D Logic provides a broad new logic for marketing what are its constructs, relationships, and outcomes? In addition, if such constructs, relationships, and outcomes are found what do they say about the boundaries, limitations, extensions, and *explanations* of S-D Logic? If an investigation uncovers boundaries of S-D Logic than the investigations bypass S-D Logic and take a new direction. If S-D Logic is the new dominant logic, boundaries will remain elusive for good reason, there should be none. However for S-D Logic to be meaningful as a marketing framework, sooner or later S-D Logic must find structure. The investigation that

provides S-D Logic structure will provide insight into S-D Logic; illuminating yet not extending. Such structure should provide a similar applicability without boundary.

This investigation found no boundaries to the conceptualization of S-D Logic. This investigation did find a broad theoretic structure of S-D Logic. This structure provides constructs, relationships, and outcomes coherent with the service dominant logic of marketing. The structure provides an ability to empirically evaluate the fundamental premises of S-D Logic and give tangible form to their conceptual nature. The structure demonstrates an S-D Logic market place. This is important. Like all theoretical science the manifestation of tangible results are required to refocus the nature of the investigation. This investigation solves the “if S-D Logic debate” by providing the how and the why. Arguably the how is not simple. Yet this investigation reveals that the how is doable. The organizations investigated are employing leading edge service-oriented strategies. The existence of these leading edge organizations supports the conceptual suggestions of S-D Logic. This has significant implication. The question, “if S-D Logic”, appears solved. The question now turns to the implication and the specifics of the “how and the why.” Solving the if question, the investigation also suggests an initial look at the how and the why.

There may be boundaries to S-D Logic this investigation did not illuminate. For now S-D Logic appears supported by a grounded theory emerged from a rich s-d like environment. If the economy continues to shift in such direction than possibly S-D Logic will be the new paradigm. If so, then this investigation may provide insight into the structure of that new economy.

The analysis now turns to review the fundamental premises. Each premise is presented. The premises are briefly explained. The premises are then assessed based upon the empirical insight provided by the structure of the grounded theory.

#### 4.3.2.1 FP<sub>1</sub>: The Application of Specialized Skills and Knowledge is the Fundamental Unit of Exchange

Value is most accurately measured in use; it is in the application of operant resources through servicing of needs that customer satisfaction is manifest (Vargo and Lusch, 2004a). It is satisfaction of service requirements, whether through direct service (such as application of transportation service), or through service accommodated by product (provision of a self drive automobile), that forms the fundamental unit of exchange (Vargo and Lusch, 2004a).

#### Insights

The performance-oriented network provides insight into the mechanism that converts knowledge and skill into value. Figure 5 illuminates the process by which network actors exchange operant assets in pursuit of continuous value creation. The grounded theory provides a theoretical basis for the network exchange activities. Transactions move to the network as the conversion efficiency is greatest there. The investigation provides insight into the efficiency in which knowledge based resources are converted through the efforts of the integration.

The research found confirmation for fundamental premise 1 in those organizations converting from a product to performance strategy. In the performance-oriented network knowledge and skill is the key unit of exchange. Product exchange represents a static non-evolutionary outcome. For the performance-oriented network the key source of continuous value creation arose from operant resources.

The performance-oriented model provides the structure of a knowledge based view in which network transactions provide continuous value creation. The network lies between the firm and the market with respect to the burden of transaction specific assets. The investigation suggests the mechanism by which the network focuses knowledge-based activities as the unit of exchange and how this process achieves a performance goal.

The investigation demonstrated how performance-oriented information systems provide a potential nonlinear improvement in the marginal cost associated with the knowledge-based exchange. The knowledge-based unit of exchange reconceptualizes the constraints of time and place utility. As new value propositions occur the network has greater flexibility to divest capital assets and leverage knowledge-bases assets than the single firm-customer dyad.

#### 4.3.2.2 FP<sub>2</sub>: Indirect Exchange Masks the Fundamental Unit of Exchange

Micro specialization and monetization of the market (indirect exchange) masks the fundamental unit of exchange; “money, goods, organizations, and vertical marketing systems are only the exchange vehicles” (Vargo and Lusch, 2004a, p. 8). Industrial production efficiencies distanced those performing tasks from contact with the customer. Those involved as micro specialists seldom have a view of the entire product. Microspecialist are indirectly compensated by the market through salary paid by the organization (Vargo and Lusch, 2004a). This structure, unchecked, fosters slow degradation in quality to both internal and external customers. The rise of quality management is meant to overcome this negativity of efficiency and instill accountability for product quality into entities separated from customer contact due to micro specialization (Deming, 1982; Vargo and Lusch, 2004a).

## Insights

The investigation provides insight by illustrating how a service oriented network overcomes the effects of micro specialization. The establishment of an actionable measure of customer value focuses the network. This metric provides the tangible goal that orients the network on customer perception of value. The research suggests that network managers must redefine quality programs conceptualized in a product-oriented strategy.

The research supports the second fundamental premises. The network generates effort compiling and decomposing the value based metrics. This effort overcomes the masking effects of indirect exchange. The emerged theory explicates how linking the performance metric with discrete activities brings the microspecialist back in contact with the customer and promotes learning. Those involved in the service-oriented exchange focus on effect, and subsequent value. The focus on the value metric realigns, and in essence does away with, the tiers of the supply chain. The grounded theory provides the explicit mechanism through which decision impacts customer perception of value. The investigation reveals the individual network “micro-specialist’s” view of the entire enterprise and how their activities impact that enterprise.

### 4.3.2.3 FP<sub>3</sub>: Goods are Distribution Mechanisms for Service Provisions

Initially, marketing focused on distribution and exchange of goods (Alderson, 1957; Shaw, 1916; Vargo and Lusch, 2004a). The market is now centered on the application of “specialized knowledge, mental skills, and to a lesser extent, physical skills” (Vargo and Lusch, 2004a, p. 8). Adopting this perspective, goods serve as a vehicle around which operant resources are exchanged with the consumer to satisfy higher order needs. “People often purchase goods because owning them, displaying them, and experiencing them (e.g. enjoying



knowing that they have a sports car in the garage, showing it off to others, and experiencing its handling ability) provide satisfaction beyond those associated with the basic functions of the product (e.g. transportation)” (Vargo and Lusch, 2004a, p. 9). The service-centric view rationally explains customer consumption experience.

### Insight

The investigation provides the structure, constructs, relationships, and outcomes that explain how goods act as distribution mechanisms for performance provisions. The value proposition associated with a good has a temporal element. The goods-based value proposition does, in general, erode. This temporal element influences network strategy. The goods based view is inadequate in its ability to explain long term, post purchase, relational behavior. The grounded theory explicates how the value proposition of a good erodes overtime. The value proposition afforded by service distributed with a static good today is not likely to afford the same value proposition in the future. A goods based view does not capture the evolutionary dynamic associated with perception of value in a performance environment.

This research confirms this fundamental premise by demonstrating how service transcends the product as source of value. The service-oriented network knowledge based view focuses on providing service, not providing a product. This view is liberating. The perception of service value is inherently dynamic and evolutionary. The goods-based view is static and compliance oriented.

The investigation explains evolutionary sense of value, and the mechanism by which the knowledge enabled network continually attends to that sense of value. The evolutionary sense of value in service-orientation is incommensurable with a product-orientation. This mixture is

entropic and tension creating. The views are incompatible. The expectation that these incommensurable strategies can self assimilate is not rational. Discordant product and performance comingling inherently creates tension. Product and service-orientation amalgamation is inherently non-sustainable. The resources required to sustain and stabilize such volatile concoctions are at best inefficiently exhausted. The more rational resource use is to convert the product-based infrastructure, policy, training, and law to support the service-oriented approach.

#### 4.3.2.4 FP<sub>4</sub>: Knowledge is the Fundamental Source of Competitive Advantage

Knowledge, an operant resource, is at the core of competitive advantage (Vargo and Lusch, 2004a). The application of specialized skills and knowledge is the fundamental unit of exchange. Market based knowledge and core competency intertwine to form the basis of competitive advantage. Further, “knowledge as the basis for competitive advantage can be extended to the entire supply chain” (Vargo and Lusch, 2004a, p. 9). Vargo and Lusch (2004a) argue that the primary inter-firm flow is knowledge with or without accompanying product. It is through knowledge that firms, aligned with partners, bring value to consumers. In S-D Logic, competitive advantage is based in operant resources and management’s function to co-create processes with customers that utilize these operant resources. Knowledge, through co-creation, appears to be the essence of the S-D Logic framework.

#### Insight

The investigation supports this premise. The grounded theory emerged as a knowledge-based theory of the network. The interviews and analysis seldom considered particular products. The service-oriented strategy leverages skills and knowledge to achieve continuous

value creation. The central premise of the grounded theory is efficient generation, dissemination, and conversion of knowledge into effect. The knowledge based effect creates network level value. Knowledge is a basis for renewable value creation for the network. The comparative efficiency of knowledge conversion leads to competitive advantage. The grounded theory illuminates the network level inter-firm flow of knowledge with or without product. The emerged theory confirms Vargo and Lusch's (2004a) suggestion that knowledge is the basis for competitive advantage of the supply chain. Knowledge and skill generate a renewable, which is endogenous, source of value for the participants.

The investigation explains how network management functions to co-manage with the customer and network members the operant resources to create value. The grounded theory provides insight into the requirement that the network and customer develop some type of evolutionary metric that closely represents the customer's perception of value. Decomposition of the metric provides the network members the link between their decisions and the overall value proposition of the network. That link is an integral step in generating network wide learning and subsequent endogenous growth through the conversion of knowledge to value.

The research illuminates how free flow of knowledge leverages microspecialization for the network. The extra-network interactions bring valuable new sources of knowledge into the network. Similar to an expanding gene pool, the extra-network activities improve the probability that innovative solutions emerged in other networks may apply in the current network. Such innovative solutions would otherwise not have occurred in a closed form firm-customer dyad. The trans-network flow of knowledge increases the probability of discontinuous increases of value.

The emerged theoretic model shows how competitive advantage occurs in a knowledge-based model. The model demonstrates how the network creates value for the customer and the other members of the network. The network functions as long as the customers perceive continuous value creation. Network actors remain only as long as they perceive continuous value creation with network membership. The minimum value proposition is that the network provides greater value than any other network. The maximum value proposition is evaluated against some notional, near infinite value creation extreme.

#### 4.3.2.5 FP<sub>5</sub>: All Economies are Service Economies

Economics as a science is grounded in Smith's (1776) narrow concern with manufactured output. This preoccupation led to a focus on efficiency and micro-specialization. However, this trend is reversing. Varadarajan, et al (2001) discuss how micro specialization and desire to control all elements of production led to vertically oriented firms. Varadarajan, et al (2001) finds firms are moving to "de-conglomerate" and that activities and processes once performed internally as separate specializations are increasingly outsourced. This outsourcing distorts national economic accounting. Tasks performed as elements of production are now outsourced skills, once outsourced many of these tasks are accounted for as services (Vargo and Lusch, 2004a). If such skills had remained vertically integrated within the firm, they would be considered part of production costs (Vargo and Lusch, 2004a). At a macro level, the trend toward specialized outsourced skills, *service*, evolves the overall economy towards a service economy (Vargo and Lusch, 2004a).

## Insight

The research supports the premise that all economies are service (performance) economies. The grounded theory represents a fundamental shift from a product to service-oriented economy. The use of grounded theory revealed the structure of that shift. The shift reveals the action of the service aspect of the economy; “service only now becoming more apparent with increased specialization and outsourcing; it has always been there” (Vargo and Lusch, 2006, p. 44). The grounded theory explicates the conversion process that changes operant resources into value. This process, the application of skills and knowledge, was revealed by the investigation as the underlying premise of service-oriented exchange. The application of skills and knowledge as illuminated in the grounded theory is inherently relational and continuous. In this manner the grounded theory goes well beyond “Smith’s narrowed concern with manufactured output” (Vargo and Lusch, 2004a, p. 16).

The investigation provides insight into how the service economy functions by integrating knowledge of customer perception of value and knowledge from the network to achieve continuous value creation. The theoretical structure explains why the economic value of production output is limiting and how the perceived potential value of current and future service potential of the network removes this limit. The grounded theory addresses the concerns that “over time, activities and processes that were once routinely performance internally by a single economic entity (e.g., a manufacturing firm) become separate specializations, which are then often outsourced” (Vargo and Lusch, 2004a, p. 16), and that this leads to “complication.” This “complication” distorts national economic accounting systems

(Vargo and Lusch, 2004a, p. 16). The use of value metrics, and the subsequent decomposition of these value metrics, theoretically, leads to decrease in “complication.”

Vargo and Lusch (2004a, p. 9) assert “services and the operant resources they represent have always characterized the essence of economic activity.” The grounded theory explicates how knowledge based operant resources more accurately capture the valuation of the macro aggregation of microspecialization. Potential knowledge value conversion becomes the “capital” asset of the operant based economic model. Economic value is captured as the ability of the entity to leverage its network(s) to generate continuous value creation. Vargo and Lusch (2004a) state that a service value may more appropriately explain differences in capital valuation of corporations and stock prices. This investigation provides support for this contention. The stock price of a company might represent the net present value of that company’s potential to generate continuous value, as positioned in the company’s associated network relationships. In the knowledge-based economy information is the raw material of production, then network based knowledge management and decision is the production operation, effect represents the output of production.

#### 4.3.2.6 FP<sub>6</sub>: The Customer is Always a Co-Producer (Co-Creator)

The customer is the target of production in the goods-centered view. This is inconsistent with the normative goal of marketing constructs of customer responsiveness, and customer orientation (Kohli and Jaworski, 1990; Levitt, 1960; Narver and Slater, 1990; Vargo and Lusch, 2004a). The normative constructs are not compatible with a product-orientation or the 4 Ps (Vargo and Lusch, 2004a). Customer orientation has led to a focus on adapting to current customer needs while anticipating future needs (Kohli and Jaworski, 1990). In this perspective,

production is an intermediary process (Vargo and Lusch, 2004a). For S-D Logic durable goods are a service delivery mechanism (FP3). The product design provides a service (Vargo and Lusch, 2004a). The product, such as the durable goods, is surrounded by services such as learning to use, repair, and adapt to unique needs (Vargo and Lusch, 2004a). The increased revelation of this phenomena in the economy leads to an increase in the demand of real time marketing that “integrates mass customization and relationship marketing” (Vargo and Lusch, 2004a, p. 11).

### Insight

The investigation confirms this fundamental premise. PBL reveals a leading edge S-D Logic environment. The participants in this environment use the term co-management. Co-management is conceptually and theoretically co-creation. For the grounded theory the construct is “co-management of continuous value creation.” The research participants were oriented toward the idea of managing the continuous value creation. The analysis and interview provided significant insight into how customer interaction emerges in the shift from a product to service dominant logic. The previous product based sustainment programs saw the customer as a target of the networks activities. The performance-oriented strategy requires ongoing co-management with the customer.

The sustainment network’s value propositions depend on operant resources. The customer is a key operant resource. The customer evaluates the value generated by the network. The customer assessment of the network value proposition is dynamic, evolving over time. The potency of x today is not the potency of x tomorrow (Alderson and Martin, 1965). Co-creation generates insight into that evolving sense of value. Efficiently managed the network co-creation relationships increase the probability of satisfying evolving sense of value.

Vargo and Lusch (2004a, p. 19) state that “the customer becomes primarily an operant resource (co-producer) rather than an operand resource (“target”) and can be involved in the entire value and service chain in acting on operand resources.” The grounded theory explicates the how and the why of this co-creation in a network wide environment. The research suggest the manner in which this how and why is influenced by macro marketing (environmental) variables. This integration captures the essence of Hunt’s (2000) institutional influences. The entire network is a source of knowledge from which to co-create continuous value.

The product-oriented view rationally treats suppliers as a source of product that supports the focal firm. The grounded theory illuminates competitive advantage in a service-oriented network and seeks an evolutionary customer value propositions. In the service-oriented network the idea of least cost bidder becomes incoherent. The value proposition inherently erodes. Current and future value-proposition potential therefore drives network partner selection. This value proposition is contingent upon the network structure. The value of a potential network partner is likely nonlinear due to interaction with some other network partner value proposition. Therefore there is no rational manner to pick partners based upon isolated cost structure valuation. The knowledge-based view demonstrates co-creation as a construct that involves all network partners.

Vargo & Lusch (2004a) correctly characterize production as an intermediate step. The grounded theory explicates processes of knowledge based “production” of continuous value creation across a fluid service-oriented network. This value creation occurs between the customers, the integrator, and the network of firms. The value proposition for the network actors must be high enough for them to make a decision that consumes resources and creates



an effect that results in continuous value creation. Each actor evaluates the value proposition associated with network goal alignment. That value proposition must be high enough for those members to stay committed and investing in the network outcome. In this manner all the network members are co-creators of value. The network orientation blurs the lines between customers, focal firm, and network entities.

#### 4.3.2.7 FP<sub>7</sub>: The Enterprise Can only Make Value Propositions

Neo classical economic view holds that marketing provides value added function (4Ps) in addition to the value embedded through production (Vargo and Lusch, 2004a). Global competition, increasing technological turbulence, and economic deregulation highlighted the limitation of this approach, and forced the evolution towards customer orientation (Kohli and Jaworski, 1990; Stock and Lambert, 2001; Vargo and Lusch, 2004a). Customer orientation, is more comprehensible from a framework of value co-creation as articulated by S-D Logic (Vargo and Lusch, 2004a). The firm learns from the market (customers, competitors, technology, and supply chain), disseminates that knowledge, and responds in quest for sustained competitive advantage (Gatignon and Xuereb, 1997; Hunt, 2000; Im and Workman, 2004; Kohli and Jaworski, 1990). Competition provides feedback in the form of competitive advantage which promotes learning (Hunt and Arnett, 2003; Jaworski and Kohli, 1993). This co-creation of value with the customer calls for adoption of new fundamental economics axioms. S-D Logic holds that value is in co-creation, coupled with customer acceptance of value proposition. This implies the enterprise can only offer value propositions (Vargo and Lusch, 2004a).

## Insight

The investigation supports the proposition that the enterprise can only make value propositions. The emerged theory suggests that exchange is rational only as an evolutionary value proposition. The value of service today will be different in the future. The product today may be the same in the future, yet the perception of value associated with that product is likely to be different in the future. The customer perception of value is dynamic. This dynamism may be caused by a shift in the customer desire, by a shift in the customer's reference (new knowledge of a superior proposition) or any number of other factors. The knowledge-based view embraces such evolution. The network is equally adept at evolving the network value propositions. All sources of knowledge that shift the customer perception of value are sources of knowledge that enable the network tomorrow to provide a superior proposition than the network today.

The network knowledge based resource view suggested by the investigation provides a dynamic economic model that is non-consummatory, evolutionary, and capable of endogenous growth. In this network based knowledge resource view resources are comprised of customer and network entity knowledge and skill. This view suggests a dynamic alternative to the limitations of neo-classical economics. The model suggests all network participants are both consumers and providers of the network value proposition. This is illuminating of Vargo and Lusch's explanation of the premise of the value proposition as aimed at the customer;

The focus is not on products but on customers' value-creating processes where value emerges for customers and is perceived by them.... The focus of marketing is value creation rather than value distribution, and facilitation and support of a value-creating process rather than simply distributing ready-made value to customers (Vargo and Lusch, 2004a, p. 19).

The whole of S-D Logic however implies an enterprise level value proposition. The grounded theory includes all network members as part of this value proposition. The market structure obscures the fact that the customer is typically the last entity to commit to the exchange. All network members evaluate the enterprise value proposition. In many cases these members all “pre-commit” or commit to the exchange prior to the customer consummating the exchange. In a service (performance) oriented network entities exchange knowledge in an effort to generate a continuous value creation proposition. Each network actor makes an evaluation of this value proposition as they choose to remain part of the network.

Some authors extend the value proposition beyond service-centric. These authors propose that value propositions are transcendental to each individual customer, and thus they espouse an experience-centric logic (Prahalad and Ramaswamy, 2004a). Vargo and Lusch (2004a) discuss that off balance sheet intangibles such as brand and hedonic satisfaction influence the perception of value. The grounded theory use of gratification and brand along with financial measures and customer service value explicate an S-D coherent structure of an experience-oriented view. The grounded theory provides the mechanism in which S-D Logic supports each network member’s evaluation of a holistic group of variables in their determination of the value proposition of being associated with the network.

The investigation addresses the inherent gratification (experience value) associated with being part of the service (performance) oriented network. This sense of gratification applies to all network actors to include the customer. Again this aspect of value is largely incomprehensible from a product-oriented perspective. The service-oriented view explicates value in use.

The research illuminated the tension created in the transition from product to service orientation. The knowledge-enabled network consumes knowledge to create value. The enterprise ability to harvest the value of knowledge challenges the product-oriented static valuation of knowledge. For a service-oriented network, knowledge in use creates value. Knowledge value propositions are inherently dynamic, largely tending to erode over time. Like products in inventory the value is not in the knowledge itself. The value of the knowledge is in use as the enterprise makes value propositions. These propositions are evaluated by customers, potential customers, network entities and potential network entities alike.

#### 4.3.2.8 FP<sub>8</sub>: A Service-Centered View is Customer Oriented and Relational

Vargo & Lusch (2004a, p. 11) assert that the service-centered view is “interactivity, integration, customization, and co-production.” These are inherently customer focused and relational. Doing things not just for, but also with customers, provides a balanced-centricity. Prahalad and Ramaswamy (2004a) extend this to focus on the experience, or a performance-centeredness. This concept can be applied to supply chain management’s more normative performance-centric view of the exchange, where value of exchange is cost benefit perceived from the perspective of each exchange partner (Lambert and Garcia-Dastugue, 2006). The service-centered view is “participatory and dynamic”, it hinges upon co-creation through learning (Vargo and Lusch, 2004a, p. 11). This requires, at the aggregate, relational structures supportive of knowledge sharing, dissemination, and response. These structures are inherent even in seemingly single transaction structures, according to Vargo & Lusch:

It might be argued that at least some firms and customers seek single transactions rather than relationships. If "relationship" is understood in the limited sense of multiple transactions over an extended period, the argument might be persuasive. However, even in the cases when the firm does not want

extended interaction or repeat patronage, it is not freed from the normative goal of viewing the customer relationally. Even relatively discrete transactions come with social, if not legal, contracts (often relatively extended) and implied, if not expressed, warranties. They are promises and assurances that the exchange relationship will yield valuable service provision, often for extended periods. The contracts are at least partially represented by the offering firm's brand. Part of the compensation for the service provision is the creation and accumulation of brand equity (an off-balance-sheet resource)" (Vargo and Lusch, 2004a, p. 20)

Even though a particular customer may only engage in one exchange with network, the network offering is inherently co-created with some (aggregate) customer (Vargo and Lusch, 2004a). The relational aspects of the exchange are implied in associated with the "aggregate customer" along with the institutional norms that govern the exchange (Heide and John, 1992).

#### Insight

The grounded theory supports this premise. The performance-oriented network is inherently relational. Co-management, setting of the performance metric, and decomposing that metric, requires relational structures. The network knowledge-based view exhibits an evolution of continuous value. The network ability to sense value proposition of the customer and network and respond to that responds in an evolutionary fashion predicts network exchange and the network ability to achieve continuous value creation. This predication implies relational structure regardless of the discrete aspects of a singular exchange.

The grounded theory explicates theoretical structure of a service-centered view through the dynamics of the co-created value metric. The co-created value metric is a tangible link between the knowledge-based decision process and customer perception of value. The metric focuses the network activity in a performance-centric strategy.

The value metric construct provides two significant insights. The first insight is that the network can co-create a metric that efficiently captures customer value in a dynamic sense. The

network efficiency increases as the gap between the metric and true sense of value decreases. The “true” customer value is assurance that the aircraft is ready to do the required mission when required at an affordable cost. The network agrees that some metric reasonably represents an acceptable measure of that value. This is not a simple achievement but it is achievable. Therefore the focus now shifts to how the network can achieve co-creation of a value metric more efficiently or in less evolved networks. The second insight is that a decomposable value metric is actionable and explains network based marketplace learning. The network establishes a decomposable metric from which disaggregate parts can be understood, flowed down, and incentive assigned in a way that leads to improvement.

These two insights explain the theoretic structure behind a service oriented view that is customer oriented and relational. The grounded theory explicates how network actors engage in knowledge based transactions. Knowledge based transactions are inherently relational. Efficiency increases as the network closes the gap between “true” customer value and the co-created performance metric. The ability to close that gap requires relational structures. The network generates insight into that “true” value through relational exchange with the customer and the network (Morgan and Hunt, 1994). The relationship is not a normative value of some type of “goodness”, instead the relationship serves to reduce the transaction cost associated with gaining insight into the customer’s current perception of value and predicted trended evolution of that value.

#### 4.3.2.9 FP9: Organizations Exist to Integrate and Transform Micro-Specialized Competences into Complex Services that are Demanded in the Marketplace.

In 2006 Vargo and Lusch (2006) added a ninth fundamental premise. This premise addresses the role of integrating resources. Vargo and Lusch (2006a, p. 283) assert that this integration function is “equally applicable to individuals and households, or more generally all economic entities are resource integrators.” They claim it is integration that facilitates exchange. Vargo and Lusch (2006) contend that micro-specialization requires integration; that is the bundling of resources to create service people want. This premise brings together co-creation (understanding what people want) and integration (bringing together micro-specialist) to satisfy performance requirements. Vargo and Lusch (2006, p. 53) argue that this premises may very well “provide a framework for a theory of the firm.”

#### Insight

The investigation supports this premise. The investigation demonstrates the manner in which the network integrator exists in an entrepreneurial fashion facilitating the knowledge conversion to value process. For knowledge to be valuable the knowledge must be transmitted either through face to face contact or some type of knowledge generation and dissemination infrastructure. Increased efficiency of that infrastructure generates greater continuous value creation. Transitioning from a product to knowledge enabled economy demands system level awareness, knowledge of customer, and decomposition of customer sense of value. The analysis generated by the grounded theory, illustrated how the shift from product to service leads to a manifestation of an integration function. The service-oriented exchange network

arises when the value generated by efficient network integration exceeds the cost associated with that integration in comparison to similar value proposition in the market or the firm.

Vargo & Lusch (2006) submit that S-D Logic “offers a different perspective” on Coase’s work. For Vargo & Lusch (2006) the acceleration of microspecialization restricts market options. Vargo & Lusch (2006, p. 52) contend that if a “person is an expert on multivariate statistics.... This person will infrequently run across people who want the direct application of this or her services.” Vargo & Lusch (2006, p. 52) state that these people when conceptualized through S-D Logic as “inputs the entrepreneur combines to create services that people want.”

This is an interesting, and correct insight, S-D Logic logically extends to a network level mode. The investigation findings confirm a network level application of Coase’s (1937, p. 3) suggestion that it is the entrepreneur who provides the “coordinating function” (Coase, 1937, p. 3). Coase (1937, p. 3) questions how economist can argue whether “co-ordination is the work of the price of the price mechanism in one case and of the entrepreneur in another.” Coase (1937, p. 3) states that resource “allocation is dependent on the entrepreneur-co-coordinator.”

The investigation reveals that the network integrator operates in a similar fashion to the firm entrepreneur. Coase (1937, p. 15) notes that he uses “the term entrepreneur to refer to the person or persons who, in a competitive system, take the place of price mechanism in the direction of resources.” For Coase (1937) the integrator is the network level “entrepreneur.”

Coase (1937) stated that the firm exists as long as some transactions are accomplished more efficiently in the firm than the market. As the firm continues to generate transaction efficiency the firm size continues to grow. At some point the increase in firm size creates a marginal burden that does not outweigh the marginal value. Coase (1937) described the firm as



generating efficiency with respect to contract, contract enforcement, and other such product-oriented related activities. In a similar fashion the grounded theory predicts based upon efficiency where transactions occurs. The grounded theory emerged a very similar finding with a subtle knowledge-based shift to the network. In a service-oriented knowledge enabled view network integration is what provides the efficiency in focusing the exchange of operant resource toward some network level value propositions capture and decomposed through the co-created value metric. The value metric coupled with enterprise wide solutions provides a network based extension that satisfies Coase's (1937) concern with price mechanism. For Coase's (1937) the focus was on price. The investigation suggests that a service-oriented network supports and extends Coase's price mechanism to a network concern with value propositions. For these value propositions cost is simply one aspect.

The investigation provides a theory of the network based upon a foundation of S-D Logic. The grounded theory explicates the role of the network integrator. The network integrator as described by the participants is wholly comparable to Coase's (1937) entrepreneur and the integrator of S-D Logic. The integrator by garnering support for a value metric and its decomposition takes the "price mechanism in the direction of resources" (Coase, 1937, p. 3). The emerged network theory suggest that for some transactions the integrators acts more efficiently than the market decomposing customer perception of value assigning that decomposition based upon the individual entity discrete knowledge based transactions. Through this decomposition and reward the network entities learn how their discrete transactions impact a phylogenic sense of value. This decomposition and assignment acts to provide the learning previously lost due to monetization masking the actual valuation of

microspecialized exchange activities (Vargo and Lusch, 2004a). In this function the integrator does away with classic approaches to quality management. This finding can be explained in the following manner:

$$KC_{exp} = \frac{\alpha(\sum_{t=1}^m [V_t])}{\beta(\sum_{t=1}^n [R_t])}$$

*KC<sub>exp</sub> = the knowledge conversion efficiency of the decision > 1*

$\sum_{t=1}^m V_t$  = *the perceived value created by the decision*

$\sum_{t=1}^n R_t$  = *perceived resources consumed by the decision*

*m = unit of time the value is created*

*n = unit of time resources are consumed*

*α = some coefficient of increased network efficiency through integration*

*β = some coefficient of resource burden of the integration function*

The market has transitions from a “product and production forces to a consumer focus and, more recently, from transaction focus to a relationship focus” (Vargo and Lusch, 2004a, p. 20). The emerged grounded theory provides insight into how network relational structures generate continuous value creation. The network efficiency is based upon generation, dissemination, and conversion of knowledge to value through and ability to sense and respond divided by the cost associated with that process.

The theory of the network predicts which transaction will go to the network. As the network reduces knowledge-based transaction cost more transactions will move to the network. As the knowledge based value propositions increase in the network more transactions

move to the network. The increased efficiency of network based knowledge generation, and dissemination systems (Day, 2004) explain deconglomeration activities increasingly evident in the market (Varadarajan et al., 2001). Network transactions influence, and are influenced by, normative values surrounding the network activities (Heide and John, 1992).

#### 4.3.3 Assessment of the S-D Logic Debate

Grounded theory provides an empirical platform to assess the S-D Logic literature. This section returns to the literature debate surrounding S-D Logic as a new marketing framework (Kotler and Armstrong, 2005; Vargo and Lusch, 2004a). Vargo & Lusch (2004a) present S-D Logic as the new dominant logic of market one which subsumes the 4P's. The grounded theory provides an empirical basis to evaluate the debate in the literature. The literature debate generally reveals three camps, those supportive, those yet unconvinced, and those dismissive. This section uses the empirical data generated by the grounded theory to assess the three classes of conceptual argument. The grounded theory emerged from a sample rich in S-D Logic like phenomena, as such the emerged theoretic structure provides a rational foundation from which to assess the debate.

##### 4.3.3.1 Those Supportive of S-D Logic

This section begins with an assessment of the arguments supportive of S-D Logic. Table 16 provides a summary of these arguments. A number of researchers confer conceptual support on S-D Logic. In general the grounded theory provides the how and the why that supports S-D Logic. This section uses the grounded theory to specifically evaluate each of the arguments in support of S-D Logic.

Table 16  
Arguments Supportive of S-D Logic

Assertion	Confirmation
Coherent with structural changes in the market	yes
Convergence in marketing and supply chain management theory	yes
Explains relationship between information technology efficiency increases in service economy	yes
Explains the rise of knowledge based exchange	yes
Explains co-creation—subsumes market orientation	yes
Explains evolution of partner interaction	yes

#### 4.3.3.1.1 Coherent with Structural Shifts in the Market

Rust (2004, p. 23) calls S-D Logic “brilliantly insightful.” He finds S-D Logic effectively captures structural changes occurring in the market place. The shift toward S-D Logic is driven by and supported by a changing value of knowledge and knowledge support systems. Rust (2004) sees the service revolution intractably linked with the information revolution. This confluence presents the researcher with an ability to forecast the future of marketing more confidently (Day, 2004; Rust, 2004). Logically, if information technology continues to advance, the shift towards service will also intensify (Rust, 2004).

The investigation similarly reveals the market place as a complex, dynamic, and adaptive environment (Charmaz, 2006; Glaser, 1992; Holland, 1992). The organizations within this environment are complex adaptive systems (Holland, 1992). The sample chosen, PBL, represents a segment of the market undergoing a shift from product-oriented sustainment to performance-oriented sustainment. The analysis demonstrated that this environment is rich in S-D Logic like phenomena. The environment emerged a grounded theory reflective of the underlying shift in the market place. The investigation demonstrated this theory is highly coherent with the fundamental premises of S-D Logic. The grounded theory supports S-D Logic.

Therefore S-D Logic, as stated by Rust (2004) appears to represent the structural changes occurring as the market shifts from product to service. The analysis confirms the assertion that S-D Logic is coherent with structural changes in the market.

The analysis affirms the assertion that S-D Logic captures the structural shifts occurring in the market place.

#### 4.3.3.1.2 Convergence in Marketing and Supply Chain Management Theory

S-D Logic captures the growing symmetry linking marketing and supply chain management (Flint and Mentzer, 2006; Lambert and Garcia-Dastugue, 2006; Rust, 2004). Business to business marketing is becoming a leading edge source of many new marketing variables “due to its relationship intensiveness and its customer databases” (Rust, 2004, p. 25). The key attribute emerging in B2B is the ability to convert information to knowledge and effectively manage relationships. Rust (2004) believes that supply chain management provides significant validation of S-D Logic. The information and knowledge intensive demands in supply chain management provides a leading environment emerging an S-D Logic like structure (Rust, 2004). S-D Logic suggests that marketing is entering a new era and that this era will closely “resemble the business-to-business/service/relationship marketing of today” (Rust, 2004, p. 25).

The investigation supports suggestions that supply chain management networks and the structure of inter-firm thought appears well prepared to support the shift from product to knowledge-based exchange (Lambert and Garcia-Dastugue, 2006). The empirical findings and the emerged model support assertion that S-D Logic rationally explains the growing convergence of supply chain management practice and marketing theory (Flint and Mentzer, 2006). The grounded theory explication of continuous flow of knowledge between network

members is highly coherent with the previous conceptualization of the flow of goods, materials, and information proposed by supply chain management (Stock and Lambert, 2001). The network structure articulated by the grounded theory is a logical extension of supply chain management practices based in marketing theory.

The grounded theory reliance on value metrics demonstrates a reorientation of the link between all tiers of the supply chain and the customer perception of value. The service (performance)-oriented knowledge based decision process relies on evolutionary relationship between all network members to generate, disseminate, and act upon network wide knowledge. The emerged model, like supply chain management, focuses on measures of performance, oriented toward optimized aggregate level value creation (Lambert and Pohlen, 2001). The investigation finds support for the S-D Logic suggestion that the network level shift of product to service orientation rationally converges the practical execution of supply chain management techniques and theoretical application of key marketing variables.

The analysis affirms the assertion that S-D Logic captures the convergence in marketing and supply chain management theory.

#### 4.3.3.1.3 Explains the Relationship between Information Technology Efficiency and Expansion of the Service Economy

There are many marketing variables feeding “tributaries” that support S-D Logic (Day, 2006b). These variables have been “part of the marketing terrain for at least a decade” the question becomes why “they converged now?” (Day, 2006b, p. 86). The common variable in this convergence is the ability of information technology to now efficiently connect “once dispersed and hard to reach” sources of knowledge (Day, 2006b, p. 85). The common operating standards, increased power of enterprise wide systems, and high bandwidth connection, have

greatly enabled the shift to a service economy (Day, 2006b). The primary reason for the shift is information technology and its ability to “understand and enhance customer relationships” (Rust, 2004, p. 25).

Information systems emerged as a key antecedent in the grounded theory. The engine of a service strategy is the ability to sense value knowledge and respond in a fashion that converts that knowledge to value. The knowledge conversion requires the raw material of information. The findings supports research suggestions that information generation and dissemination rests on enterprise wide IT solutions (Roy et al., 2004). The findings indicate that as the efficiencies generated by these information systems increase so does the value proposition offered by the network. The grounded theory emerged “actionable” knowledge as an increasingly salient dimension associated with conversion of information to knowledge. The research participants described, and the grounded theory explains, the increasing reliance on decision support tools. The grounded theory emerged decision support tools as the “industrialization” of a knowledge based economy.

The analysis confirms S-D Logics relationship between information technology efficiency increases in service economy.

#### 4.3.3.1.4 Explains the Rise of Knowledge Enabled Exchange

Closely related to information system findings are those that affirm the S-D Logic assumption that knowledge, an operant resource, is the core competency in a service economy. S-D Logic appropriately captures the evolution in knowledge processes transforming the market place (Day, 2006b). The sources of advantage in this market place are knowledge enabled, customized offerings, realized through relational exchange, supportive of the concept of co-creation (Day, 2006b). In this, S-D Logic and its emphasis on knowledge, are consistent with the

competency based view of the firm (Prahalad and Hamel, 1990). The grounded theory suggests that a knowledge-based view more appropriated subsumes competency-based view. The knowledge-based view in turn suggests itself as a foundational element and mechanism in a resource based view of competition (Hunt, 2000). The investigation confirms suggestions that strong advantage occurs when customers “make mutual commitments through their engagement in the value-creation process” (Day, 2006a, p. 88). The solution-orientation of co-creation is supported by the shift in the nature of business offering and the marketing of these offerings; 63 percent of the Fortune 100 firms suggest they provide solutions not products (Shrama et al., 2002).

The grounded theory explicates the link between knowledge of customer perception of value, knowledge management, and the impact of knowledge processes on the network and the market. Knowledge-based exchange is the core process of the service (performance)-oriented decision process. The research illuminates the centrality of decision in the shift from exchange of goods to exchange of knowledge, and supports the fundamental premise that goods serve as transmitters of service (Vargo and Lusch, 2004a). For the grounded theory service is fundamentally a knowledge imbued co-created resource. The exchange of knowledge, and the conversion of knowledge into effect provides for evolutionary value creation. The service-oriented network provides a mechanism for phylogenic, endogenously driven, growth. The network offers not a single solution, but a continuum of solutions that provide its members value. The network value proposition remains as long as the members continue to perceive the value of the offered solutions.

The analysis confirms S-D Logic’s suggestion of the continuing rise of knowledge based exchange.



#### 4.3.3.1.5 Explains Co-Creation—Subsumes Market Orientation

Jaworski and Kohli (2006) find S-D Logic extends ideas of customer orientation. They applaud conceptualizing the consumer as an active co-creator, where “the firm and the customers do the asking, listening, observing and experimenting; that is, the firm and the customers engage in learning” (Jaworski and Kohli, 2006, p. 111). S-D Logic provides a conceptualization of exchange oriented to both the “firm *and* the customer” perform value creating activities, what remains is operationalizing the concept of co-creation (Jaworski and Kohli, 2006, p. 113). Vargo and Lusch (2004a, p. 10) propose that co-creation implies a continual relationship with the customer:

Customers still must learn to use, maintain, repair, and adapt the appliance to his or her unique needs, usage situation, and behaviors. In summary, in using a product, the customer is continuing the marketing, consumption, and value-creation and delivery processes (Vargo and Lusch, 2004a, p. 10)

The investigation confirms suggestions that value is generated in a string of activities between the customer and provider and that co-creation increases the customer responsibility to learn their role in optimizing the output of these activities (Etgar, 2006).

The grounded theory operationalizes the process of co-creation. The grounded theory emerged the category of co-management. Co-management is conceptually synonymous with the Vargo and Lush’s (2004a) co-creation. Co-creation captures both co-creation between the network entities and co-creation with the customer. The analysis confirmed that the customer is not the target of the network’s activity but an integral stakeholder in it. Customer co-creation leads to an implied agreement that all exchange partners understand current performance, understand each other’s expectations of future performance, and reach across all levels of the

supply chain to satisfy that performance requirement. Customer co-creation of value is inherently market oriented and a continuum. Co-creation anticipates an evolutionary sense of value; the value proposition today is likely to erode over time. This finding illuminates the conflicting results in studies attempting to relate satisfaction with future intention (Gustafsson et al., 2005; Palmatier et al., 2006; Prahalad and Ramaswamy, 2004b). Satisfaction in the grounded theory is a continuum; the network participant evaluates satisfaction as a trend. The satisfaction today, projected into the future is unlikely to give the same sense of value. The research finds empirical support for the knowledge-based engine of S-D Logic. The final arbitrator of value today and in the future is the customer. Comprehension of that value proposition and an ability to generate future knowledge of an evolving value proposition requires intimate relationship with the customer.

The analysis demonstrates that S-D Logic co-creation subsumes market orientation; co-creation is required to ensure continuous value creation.

#### 4.3.3.1.6 Explains Evolution of Partner Interaction

Gummesson (2004) concurs that the market indicated by S-D Logic is increasingly focused on the interaction occurring between exchange partners. For Gummesson (2004) ideas of consumption and production are limited and that it is the third element--interaction--that addresses this limitation. Interaction, he argues, is the key property of S-D Logic; it is through interactions "the parties become partners" (Gummesson, 2004, p. 20). Yet what remains are hard facts and metrics supportive of the premises of S-D Logic (Gummesson, 2004). It is likely these will emerge from leading edge S-D like market segments:

Is there a new dominant logic for marketing or just a familiar set of contingencies? We do not know the answer, and if we did, we doubt that we could be convincing within the word limit imposed on this commentary.

However, we do assert that the answer lies in the inductive development of theory from phenomena closely observed and thickly described (Deighton and Narayandas, 2004, p. 20).

The inductive technique of grounded theory emerged the category partnering dynamics. The analysis illuminated the environmentally driven requirements to increase partnership in the movement from a product to service approach. Knowledge based advantage requires knowledge from customers and network stakeholders alike. The creation of a metric representing the customer perception of value, and then subsequent decomposition and assignment of the discrete parts of that metric requires partnership. The harmonization of discrete activities towards the network-optimized goal demands reduction of “stove piped” inefficiencies. Partnership generates an increase network wide knowledge. Partnership reduces the transaction costs associated with the dissemination of that knowledge and positively influences continuous value creation. Partnership rewards reduction of uncertainty. The grounded theory explicates the partnership process and the influence of partnership has an antecedent of the knowledge conversion process.

The analysis supports S-D Logic’s rise in partner interaction.

#### 4.3.3.2 Those Interested but Unconvinced

This section assesses those supportive of S-D Logic’s promise but await confirmation. Table 17 provides a summary of these questions. In the S-D Logic debate a number of researchers are interested, but await further empirical support. This empirical support is required to address and illuminate the structure of S-D Logic. In general the emerged model provides the practical and theoretical how and the why of S-D Logic and thereby the evidence

required by those yet unconvinced. This section relies on the grounded theory to address these concerns.

Table 17  
Interested But Unconvinced

Assertion	Confirmation
Shape of the paradigm is uncertain	Yes
No clear actionable model—requires theoretic work	Yes
Relationship to Resource Advantage Theory	Yes
Resistance to the shift to S-D Logic	Yes

#### 4.3.3.2.1 Shape of the Paradigm is Uncertain

A number of authors accept the general argument of S-D Logic. These scholars are hopeful but pragmatic. They await resolution to the fact that the “shape of a new paradigm, [is] anything but certain” (Webster, 2006, p. xiii). Deighton and Narayandas (2004) agree that S-D Logic appears to explain marketing phenomenon of the last decade, yet they question whether this is a new dominant logic or a “familiar set of contingencies” (Deighton and Narayandas, 2004, p. 19). They assert the “answer lies in the inductive development of theory from phenomena closely observed and thickly described” (Deighton and Narayandas, 2004, p. 19).

The grounded theory emerged structural support for S-D Logic. The inductive theory is coherent with S-D Logic and provides rational explication of the constructs, relationships and outcomes of a network theory consistent with S-D Logic as its foundation (Lusch and Vargo, 2006b). The empirical analysis provides shape and form to the new paradigm. The inductively generated theory defines variables and hypothesizes theoretic relationships of that new paradigm. The grounded theory provides initial shape and empirical support for S-D Logic and its fundamental premises. The grounded theory directly addresses the concerns by illuminating

how S-D Logic relates marketing phenomena of the last decade, such as market orientation, innovation, relationship marketing, and supply chain management, in a new theoretical structure (Deighton and Narayandas, 2004). The grounded theory provides a theoretical structure from which to reevaluate the marketing variables of the last century from the emerging paradigm of S-D Logic. The framework provides an entirely new theoretical framework from which to consider a “familiar set of contingencies” (Deighton and Narayandas, 2004, p. 19).

The grounded theory provides the initial inductive theoretical framework which to give shape to S-D Logic.

#### 4.3.3.2.2 No Clear Actionable Model

The debate highlights the conceptual nature of S-D Logic (Webster, 2006). The debate is constrained by the limited empirical support for S-D Logic’s boundaries, limitations, and extensions (Deighton and Narayandas, 2004). There is no clear model explicating the processes, antecedents, and outcomes of S-D Logic. S-D Logic, to be a foundation for a general theory of marketing, requires an initial model. Until then S-D Logic provides a rich research area where there is much theoretical and practical work to be done (Day, 2006b). From the firm perspective S-D Logic requires a clear model of its antecedents, processes, and outcomes. Failing this, firms will be slow to adapt to the strategic prescriptions of S-D Logic (Day, 2006b). Firms, burdened by inertia from previous product-centric decisions, will find it difficult to unlearn those lessons (Bettis and Prahalad, 1995). Without clear explication, most firms, and most researchers, are unlikely to embrace and extend what is argued by Vargo and Lusch (Day, 2006b, p. 88).

The grounded theory provides an inductively derived theory suggestive of the structure of S-D Logic. The service-oriented network theory is actionable. The theory provides constructs with clearly identified theoretical relationships. The method, grounded theory, provides a theoretical structure that is well suited for follow-on deductive generalization. The grounded theory describes the antecedents, processes, and outcomes of a service-oriented market; it is an initial model of S-D Logic like phenomena. This model supports follow on generalization and prediction.

For the market under study the senior executives confirmed the grounded theory as an actionable model and that the grounded theory illuminated the structure of the evolving market. These executives indicated the emerged grounded theory captures the shift from a product to a service structure. The executives stated that the idea of the service-oriented mindset is of great value. There are currently a number of efforts underway to generate performance based logistics education. The executive indicated the emerged theory provides a rational foundation from which to reconsider the structure of those educational programs. When presented with the general concepts of S-D Logic the executive readily understood the link between S-D Logic and the grounded theory.

The grounded theory provides an initial explication of key variables and their relationships supportive of deductive S-D Logic investigation and practitioner application.

#### 4.3.3.2.3 Relationship to Resource Advantage Theory

Hunt (2004) finds that S-D Logic is coherent with resource advantage theory, “V&L’s (Vargo& Lusch) argument is historically informed, finely crafted, properly interdisciplinary, and logically sound” (Hunt, 2004, p. 22). Hunt is particularly mindful of the distinction with respect

to resources as both tangible and intangible, however what's "missing are the arguments for the 'why' and the 'how'." Hunt (2004, p. 22) extols researchers to give S-D Logic a "careful read and thoughtful evaluation, not a quick skim and hasty judgment." In resource advantage theory "value refers to the sum total of all benefits that consumers perceive they will receive if they accept a particular firm's market offering" (Hunt, 2000, p. 138). For resource advantage theory "firms learn through competition as a result of the feedback from relative financial performance signaling relative market position, which in turn signals relative resources" (Hunt and Madhavaram, 2006, p. 72).

The grounded theory provides some of the initial "how" and "why" of S-D Logic. Like resource advantage theory the grounded theory acknowledges that value is the net sum total of perceived benefit that consumers, and network participants receive. Like resource advantage theory, the grounded theory accepts that firms learn as a result of feedback from financial performance. The grounded theory provides a network level model of how this occurs in a knowledge-based economy. Resource advantage theory is an "evolutionary, disequilibrium-provoking, process theory of competition, in which innovation and organizational learning are endogenous" (Hunt and Madhavaram, 2006, p. 72).

The grounded theory articulates a resource advantage theory coherent theoretical model in one segment of the market. The grounded theory focuses on knowledge based assets and the conversion of knowledge into value. The service (performance)-oriented network theory explicates the mechanism of endogenous phylogenic and non-consummatory growth; knowledge tomorrow is rationally expected to support a superior value proposition. The network theory and its mechanisms are supportive of the underlying explana of resource

advantage theory (Hunt, 2000). In this way the hypotheses of the service-oriented network theory are well aligned with theoretical assumptions of resource advantage theory. S-D Logic, as informed by the grounded theory appears to be supportive, and illuminating of the foundations of resource advantage theory.

The investigation finds empirical support of the congruency of S-D Logic and resource advantage theory.

#### 4.3.3.2.4 Firm Will Resist the Transition to the S-D Logic Shift

Day (2004) is concerned that firms will resist the shift to S-D Logic. The firms will tend to rest on what they know and will have difficulty breaking path dependency. Day (2006b) goes on to question if consumers will engage in intimate marketplace relationships due to risky relationship specific assets. There is an expectation that both goods and service framework will coexist for some time (Day, 2006b). Shugan (2004) asserts that S-D Logic is too abstract and lacks an account for realities in business, and non-marketing functions are unlikely to embrace S-D Logic. Arnould, Price, & Malshe (2006, p. 102) wonder if firms will “resist consumers’ attempts to exert influence over servicescapes instead of welcoming and guiding their co-creation of value.” Levy (2006) insists that for S-D Logic to be a new framework it will require support from both managers and scholars, and such support will take time. Levy (2006) questions when, and if, marketing as a discipline (both academic and practical) will recognize the centrality of customers as posited by Vargo and Lusch (2004a).

The investigation confirms organizational and individual resistance to the shift from product to performance-oriented strategies. The findings demonstrate that functionally orientated “ilities” resist the shift to performance-orientation. The investigation turned up numerous stories of those customers, firm members, and network organizations that resisted



the shift to performance strategy. Some of these resistors recognized the shift was occurring and simply did not want to lose their power. Others resist because they do not understand that the shift is occurring.

Lusch, Vargo, & O'Brien, (2007, p. 17) recognize this conundrum, “unfortunately, most businesses (including retailers) tend to view external environments as resistances, if not countervailing forces rather than resources.” The analysis illuminated dimension to this resistance. The resistance tended to be mid-level phenomena. Generally CEOs, CFOs, and other senior leadership appeared to understand the potential of competition through knowledge and service and embraced the shift to a service-oriented strategy. The insights generated from the grounded theory indicate that resistance is a real concern. The ability to overcome the resistance is integral to establishing a service-oriented mindset.

The investigation confirms that firms resist the transition to S-D Logic competition.

#### 4.3.3.3 Those Dismissive of S-D Logic

This section addresses the arguments dismissive of S-D Logic. Table 18 provides a summary of these arguments. S-D Logic has generated significant debate. In this debate some are dismissive of S-D Logic. Some base this argument in the fact that S-D Logic does not go far enough, others that there is “nothing new” in S-D Logic. This section uses grounded theory to assess these arguments.

Table 18  
Arguments Dismissive of S-D Logic

Assertion	Confirmation
Retains firm centrality of the old paradigm	no
Does not illuminate customer experience value	no
Does not address cash flow	no

Does not move marketing beyond managerial orientation	no
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4.3.3.3.1 Retains Firm Centrality of the Old Paradigm

Some critiques say S-D Logic is limited by its firm-centric nature (Prahalad and Ramaswamy, 2004a; Prahalad and Ramaswamy, 2000; Prahalad and Ramaswamy, 2003). Wilkie and More (2006, p. 266) contend “ the S-D Logic has a strong explicit focus on the firm, but this may lead to difficulties for more aggregate conceptions of the marketing field.” S-D Logic in this light does not focus on the important aggregate level of analysis. Wilkie and More (2006, p. 267) posit that any new logic should attend to three primary actors “(1) marketers, (2) consumers, and (3) government entities, whose public policy decisions are meant to facilitate maximal operations” of the market place. Wilkie and More (2006, p. 267) assert that S-D Logic is rooted inside each “organization employing” S-D Logic. Wilkie and More (2006, pp. 267-70) question the ability of S-D Logic to harmonize individual organizational goals, they question the ability of S-D Logic to deal with pricing, not for profit organizations, and applicability to day-to-day marketing professionals.

The investigation affirms that the premises and structure of S-D Logic are inherently network and market wide. The grounded theory explicates how institutional level marketing variables impact the network level exchange model. The theory confirms the involvement of marketers, consumers, the government entities and more. The research provides empirical support for S-D Logic as the emerged theory specifically illuminates a network level structure that shifts focus beyond any focal firm. The addition of the integration role as a fundamental premise explicates the overall aggregate level network. The grounded theory operationalizes S-D Logic and provides practical foundation supportive of “day-to-day” marketing activities. Lastly

the investigation reveals how value metrics and their decomposition address pricing from an S-D Logic theory foundation.

The analysis demonstrates that S-D Logic is not firm centric.

#### 4.3.3.3.2 Does Not Address Customer Experience Value

Some argue that S-D Logic does not address the experiential aspects of consumption. What is required, they state, is a dominant logic explaining “interactions between consumers, consumer communities, and firms” (Prahalad and Ramaswamy, 2004a, p. 5). Experience-centric scholar authors stress that understanding the co-creation experience is key to unlocking “new sources of competitive advantage” (Prahalad and Ramaswamy, 2004a, p. 7). The co-creation experience focuses on dialogue, access, risk benefits, and transparency (Prahalad and Ramaswamy, 2004a, p. 9). This logic looks to transform the idea of relationships between firm and consumer to one in which the market is a “forum for co-creation experiences” (Prahalad and Ramaswamy, 2004a, p. 11). Prahalad (2004b) argues that co-creation “revolve [s] around the individual consumer, the experience, the co-creation of value, the criticality of consumer communities, and the need for a network of firms” (Prahalad, 2004b, p. 23). In the same tone Venkatesh, Penöaloza, & Firat (2006, p. 263) state that their model goes “additional steps, emphasizing the ways in which they co-create meaning as they jointly produce the marketplace.” Venkatesh, Penöaloza, & Firat (2006, p. 264) state that branding is “used by members and nonmembers in negotiating not only identity, but also social relations”

The criticism of S-D Logic with respect to experiential aspects of co-creation warrants consideration. These authors argue that co-creation, as explicated by S-D Logic, does not go far enough. There is question of S-D Logic’s lack of explicit discussion of consumer communities,

personalizes transactions, and forums for co-creation experiences (Arnould et al., 2006; Prahalad and Ramaswamy, 2004a). The inference is that S-D Logic is limited with respect to consideration of the meaning of brand value and consumer experience. Original account of S-D Logic by Vargo & Lusch provided limited explanation in these areas; however this does not imply that S-D Logic does not provide support for the concepts specifically addressed in this inference:

Not only do we not make any claim that service benefits are limited to functional benefits, we embrace strongly the claim that hedonic, or expressive, benefits are often more important than more utilitarian ones. Actually, we find it odd, given our inversion of the goods-service relationship, that this emphasis on intangible benefits would be overlooked. We (Vargo and Lusch 2004a) have cited Prahalad and Ramaswamy's (2000, p. 84) reference to goods as "artifacts, around which customers have experiences" and Pine and Gilmore's (1999) *The Experience Economy* as support for our view of the service role of goods. We also tied the discussion to Gutman's (1982), contention that products are "means" for reaching "end-states," or "valued states of being, such as happiness, security, and accomplishment" and pointed out that individuals often purchase goods because owning them and displaying them provide satisfactions beyond those associated with the basic functions of the product (Vargo and Lusch, 2006, pp. 50-51)

The grounded theory captures and explicates brand and consumer experience value in a manner coherent with the conceptual foundation of S-D Logic. The co-creation of S-D Logic relies on understanding the customer's sense of value. For S-D Logic value is not value in exchange but value in use. The emerged theory operationalizes this understanding of the customer, the network, and evolving perception of value. The grounded theory provides the mechanism of dynamic value propositions in a manner coherent with S-D Logic. The research supports the suggestion that S-D Logic focuses on understanding customer perception of value and therefore captures consumption experience, brand, and consumer communities. The

grounded theory identifies the direct value in the relationship along with value from gratification and brand. This explanation can be captured mathematically:

$$Vc_t = VS_t (PSc_t + RC_t)$$

$$RCn_t = Nc_t - (Bv_t + Gv_t)$$

$$Vn_t = Pt_t - RCn_t$$

$Vc_t$  = value proposition to the customer at time  $t$

$VS_t$  = The value of the service

$RCc_t$  = resources consumed customer

$Iv_t$  = Some intangible value of exchange at time  $t$  (brand)

$Nc_t$  = cost to the network for the value proposition at time  $t$

$Bv_t$  = brand value associated with exchange

$Gv_t$  = gratification value associated with exchange

$RCn_t$  = Net resources consumed at time  $t$

$Pt_t$  = total price harvested at time  $t$

$$CVC = \sum_{t=1}^n Vc_t - \sum_{t=1}^n RCn_t$$

$n$  = financially tolerable horizon

$CVC$  = network continuous value creation

The network sustains itself when:

$$\sum_{t=1}^n Vc_t > 0 < \sum_{t=1}^n Vn_t$$

The research provides a process whereby S-D Logic addresses three types of value. These types of value are the service, the brand, and the gratification associated with being part of the

network. The grounded theory provides the mechanism through which sources of value occur, and their implication for the network.

The analysis indicates that S-D Logic addresses customer experience value.

#### 4.3.3.3.3 Does Not Consider Cash Flows

Ambler (2006) argues that S-D Logic may be another look at the same old elephant from a financial perspective. Ambler (2006) finds that services have achieved a greater degree of GDP which give credence to the role of services, but that this does not mean the market is evolving to a service dominant logic. Ambler states that a dominant logic should address the contention that:

The primary aim of marketing is to build the marketing asset, which in turn will take care of short-term profits. So perhaps building brand equity in order to maximize long-term cash flow is the new dominant logic (Ambler, 2006, p. 294).

Lehmann (2006) asserts S-D Logic must prove its relevance to finance by dealing with cash flow, P/E based firm pressure to grow and non-profits. Vargo & Lusch acknowledge the importance of cash flow:

value is only created through co-creation and in interaction with the customer, we recognize that monetary flows are critical. Cash (or its equivalent) provides the firm options on future service flows and relationships. Importantly, S-D Logic also places the responsibility for firm financial performance on the marketing function and for "increasing the market value rather than the book value of the organization as it builds off-balance-sheet assets such as customer, brand, and network equity (Vargo and Lusch 2004a, p. 14).

The investigation confirms that this general concern with respect to cash flow is important.

Vargo & Lusch (2006, p. 51) agree that "financial accounting systems, by their very nature, are transactional, and financial standards do not enable a firm to capitalize most marketing investment." The research provided greater insight into this ongoing debate. The service

(performance)-oriented network creates value by generating co-created value propositions, satisfying those value propositions, and co-creating new value propositions in an evolutionary manner. S-D Logic establishes the conceptual foundation of this mechanism through co-creation. The grounded theory provides explication of how valuation of the brand value associated with being part of the network occurs. The research provides insight into how cash flow in the current exchange must reward (that is repay) previous investment, while at the same time providing for the next investment to ensure continued long-term cash flow.

The service oriented network value proposition accounts for cash flow along with some intangible sense of brand and gratification. The network value proposition is current positive cash flow after accounting for previous investment and necessary future investment to achieve continuous value creation. This process can be explained mathematically:

$$\sum_{i=1}^n Vn_t = \left( \sum_{i=1}^n P_t + \sum_{i=1}^n B_t + \sum_{i=1}^n G_t + \sum_{i=1}^n Fv_t \right) - \left( \sum_{i=1}^n (U + Uc)_t + \sum_{i=1}^n I_t + \sum_{i=1}^n \beta I_t \right)$$

$$\sum_{i=1}^n Vn_t = \text{value for the network (or firm if partial)}$$

$$\sum_{i=1}^n P_t = \text{price (or savings) harvested}$$

$$\sum_{i=1}^n B_t = \text{valuated impact on brand}$$

$$\sum_{i=1}^n G_t = \text{Valuated impact on gratification}$$

$$\sum_{i=1}^n Fv_t = \text{valuated impact on future value}$$

$$\sum_{i=1}^N (U + Uc)_i = \text{net unit costs}$$

$$\sum_{i=1}^N I_i = \text{some cost to repay investment}$$

$$\sum_{i=1}^N \beta I_i = \text{some cost to pay future investment}$$

The service (performance)-oriented network theory provides explication of how current cash flow is a snapshot and constrained by some partial differential of the cost to repay past investment and the investment in the next improvement.

The grounded theory effectively explicates how S-D Logic addresses long and short-term cash flow.

#### 4.3.3.3.4 Does Not Move Marketing Beyond Managerial Orientation

Venkatesh, Penöaloza, & Firat (2006, p. 251) argue that S-D Logic does not address the “more comprehensive and globally inclusive notion of market”, they infer that S-D Logic is limited to a managerial perspective of marketing. Venkatesh, Penöaloza, & Firat (2006, p. 254) have concern that marketing as a discipline, and as articulated by S-D Logic is focused on firm level decision making, they argue that “a more meaningful intellectual position for us would be to study markets analytically and critically as scholars of the discipline and provide an analysis of market forces and behavior.” Along similar lines Wilkie and Moore state that:

Public policy is not mentioned at all in the S-D Logic discussion. Although this is not a fatal flaw given the goals of the article, it does leave us with some uncertainty as to the capacity of this approach to deal with issues of the broader contexts and performance of marketing.... it does not appear that these issues have been systematically considered in the work presented. We believe that this is precisely because the managerial perspective within a firm does not need to consider these questions in order to act in the firm’s interest (Wilkie and Moore, 2006, p. 268).



Vargo and Lusch (2004a) introduce S-D Logic after fully articulating the evolution of both marketing and economic history since Adam Smith(1776). Vargo and Lusch (2004a) then present S-D Logic as a new marketing framework. They later follow this up by describing S-D Logic as a possible foundation for a general theory of exchange(Lusch and Vargo, 2006b). S-D Logic is well positioned as a macro-level framework. This investigation provides empirical support for this network level orientation. The service-oriented grounded theory specifically explicates how environment influences the network level activities.

S-D Logic provides accurate and consistent explanation of the empirical evidence generated by the grounded theory. The structure of the grounded theory explicates how the concepts captured in the fundamental premises of S-D Logic apply at the managerial and macro marketing level. S-D Logic's inherent concern and association with economic theory is inherently macro level. The investigation provides insight into these macro level concerns, and more specifically the way public policy (PBL, 50/50 split as directed by Title 10 of United States law, the financial constraints as applied through Federal Acquisition Regulation) impacts the network optimized operations.

Environment emerged as a salient category that influences the knowledge based exchange paradigm posited by S-D Logic. The grounded theory explicated the impact of environment. As described by S-D Logic and as evidenced by the grounded theory the network level of exchange allows for analysis of market forces and behavior to include public policy. Indeed some participants discussed how public policy led to the adoption of public-private partnerships. The analytical capability of S-D Logic is evidenced by the actionable predictive capability provided by the service-oriented network model. Integration is the core of the

service-oriented network model. Integration is an inherently network level construct with macro-marketing implications.

S-D Logic provides marketing a foundation for a network theory that is actionable at the firm, macro, and theoretical levels. S-D Logic is both managerially and theoretically oriented.

#### 4.4 Analysis: Proposed Theoretical Model of S-D Logic

This investigation provides an inductively generated theory suggestive of the conceptual structure of S-D Logic. The emerged performance oriented network theory provides the initial empirical insight into the suggestion that S-D Logic may form the foundation of a general theory of exchange (Lusch and Vargo, 2006b). In this section the grounded theory coupled with the assessment of the fundamental premises, and the evaluation of the debate provides the mechanism to inform a presentation of an empirically based theoretical structure of S-D Logic.

The grounded theory method generated a model that is highly suggestive of the underlying structure of S-D Logic. The grounded theory investigation generated constructs, theoretic relationships, and propositions that are particular to the PBL sample yet indicative of the structure of the market suggested by S-D Logic. This section reexamines those constructs, theoretical relationships, and propositions integrated with the S-D Logic literature to present a service-oriented network theory.

Figure 15  
The Service-Oriented Network Theory

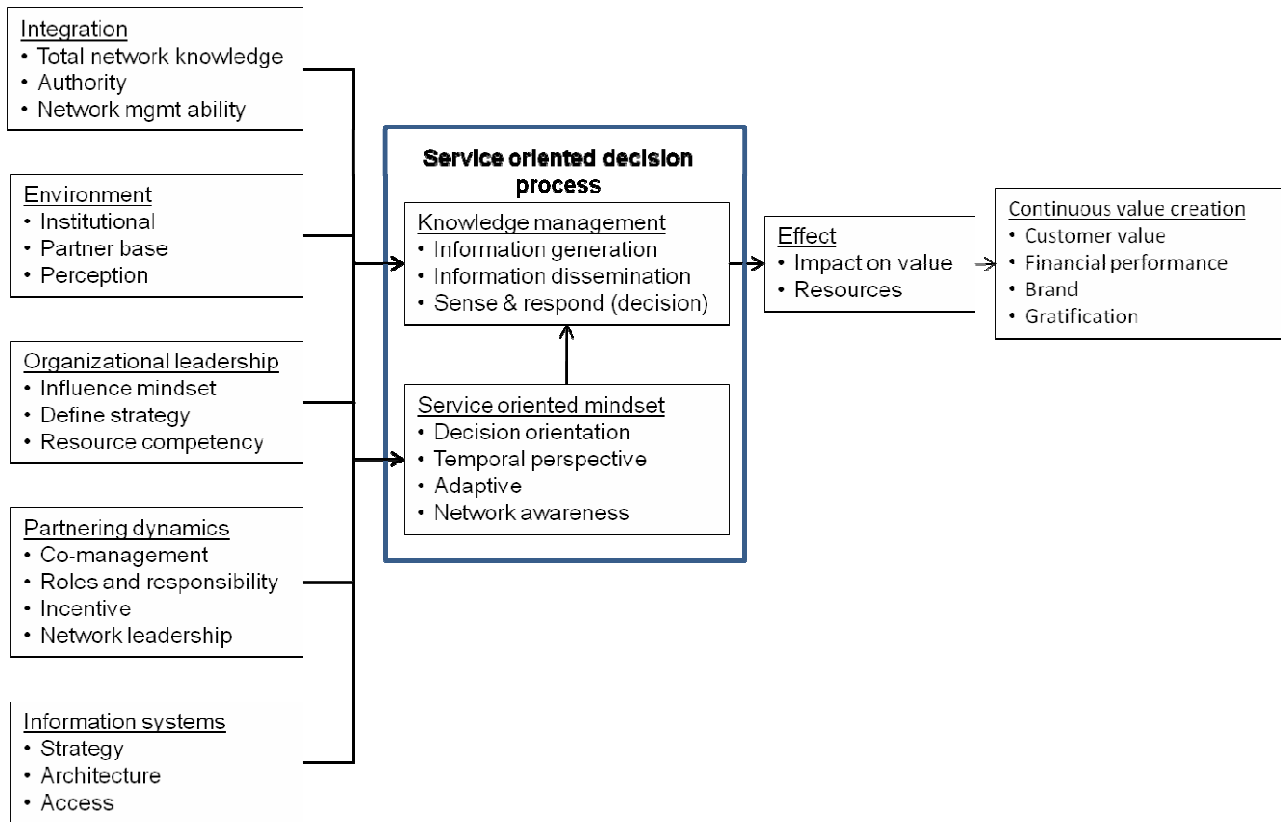


Figure 15 depicts an overview of the service-oriented network theory. The model presents the constructs and relationships of a service-oriented network. This section begins with an assessment of the service oriented decision process while interweaving the literature content of S-D Logic. The section then considers the antecedents. The final part of the section reviews the outcome:

And that is really what I am looking at, it is putting that, I always use the term that business wrapper around our supply chain, because we are selling a service ultimately. Not parts.

Grounded theory provides a rational approach to reveal the underlying structure of a substantive area (Charmaz, 2006; Glaser and Strauss, 1967b). This investigation studies knowledge based performance-oriented exchange. The investigation provides an inductively generated theoretical structure of a service-oriented network theory. The investigation into a

rich substantive area provides broad general applicability to illuminate the structure of S-D Logic.

The grounded theory emerged from a performance sustainment environment. The sample consisted of a number of major aerospace industry firms involving six major product lines. Two of which are multi-national. The performance sustainment market segment has significant revenues exuding billions of dollars annually. This market segment involves new product development, modification, and sustainment. Previous evaluation explicated the similarity in structure between the PBL environment and the knowledge-based shift described by S-D Logic.

Orientation emerged as a theoretically robust term. The performance-oriented grounded theory explicates alignment of network activity toward an evolving goal. The output of the network is a co-managed value based performance metric. That goal orients the actions of the network actors. The label orientation coupled with a service-oriented outcome removes any particular functional focus (Kohli and Jaworski, 1990). Orientation focuses attention toward service congruent with the broader perspective of S-D Logic. This focus overcomes some of the previously discussed resistance to the paradigmatic shift (Day, 2006b). The shift from the grounded theory to the service-oriented model retains the use of the term orientation.

This service-oriented network model uses the term service. The performance-oriented grounded theory relied on the term performance; that term performance is recognizable by the participants. The participants are engaged in a shift from product to performance strategy. The analysis indicated that the term service as articulated by Vargo and Lusch (2004a) is conceptually equivalent to performance. Therefore the term service maintains consistency with

the academic literature, while being conceptually appropriate. The result is a service oriented network model (SONM)

The general structure of the grounded theory is conceptually congruent with the premises and propositions of S-D Logic. There are a few areas of distinction. The first deals with the incentive structure. The performance-oriented network model rests on an incentive structure generated from co-management and *predicted* cost savings. Both mathematically and conceptually, this is congruent with more open market *potential* sales. Both incentive structures infer co-management, predicted measures of customer value, and the impact on current and future cash flows.

The second area of distinction deals with the effect of the service-oriented decision process. The effect operationalized in the grounded theory investigation is unique to performance sustainment. The network members develop a co-managed performance-oriented measure of customer value. Typically this value is an agreed to mission capability. That measure is particular to the performance-oriented sustainment network. This section reexamines effect in a generalized explication. The service-oriented network model requires co-management to generate some measure of customer value that is an efficient representation of “true” customer value. Effect then for the service-oriented network is the decision that impacts that measure of value. This concept is general; the actual effect-value link becomes specific to any particular network.

The constructs and their relationships stand on the empirical foundation provided by the grounded theory. The grounded theory began with a look to the literature as an “initial lens” dealing with the substantive area (Charmaz, 2006). The field findings then emerged

theoretical structure; during this period the investigation set aside the literature. The emerged theoretical structure provides empirical bases to dialogue with the extant literature; during this period the investigation reintroduces the literature (Charmaz, 2006). Many of the constructs that emerged in the grounded theory are similar to those of the previous 4Ps framework. This is rationale, the shift from one paradigm to the next does not cast aside previous knowledge (Hunt, 1992). The conceptual description and content of many constructs remain. It is their theoretical relationships that are broken and reconstructed by the grounded theory suggestive of the new paradigm. In this way the grounded theory adopts a theoretical agnosticism (Charmaz, 2006).

#### 4.4.1 Service-Oriented Decision Process: The Construct

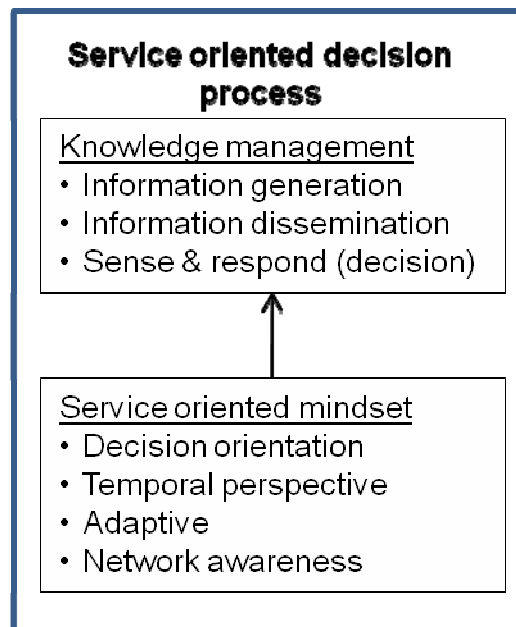
The grounded theory emerged a highly knowledge oriented network model. The network represents the shift to a service-based environment. A key finding of the grounded theory is that knowledge forms the fundamental source of continuous value creation. This is congruent with the 4<sup>th</sup> fundamental premise of S-D Logic, knowledge as the fundamental unit of competitive advantage (Vargo and Lusch, 2004a). The grounded theory explicated how knowledge forms competitive advantage. That explication suggests that the logical operationalization of S-D Logic revolves around a core construct of knowledge management. The service-oriented network theory operationalizes that construct as the service-oriented decision process. That construct is composed of knowledge management and the service-oriented mindset.

The investigation revealed the lifeblood of the service-oriented network is the generation and dissemination of network wide knowledge. The knowledge, in an actionable

form, represents potential value. That potential value is converted into network value by the entities' ability to sense and respond through a value producing *decision*. Service-oriented decisions emerged as the fundamental production process in a knowledge-based economy. This supports fundamental premise 5, all economies are service economies, and fundamental premise 7, enterprise can only make value proposition (Vargo and Lusch, 2004a). The service-oriented decision process is wholly coherent with S-D Logic. These empirical findings, coupled with the S-D Logic literature, support the presentation of service-oriented decision processes as the central construct of S-D Logic:

We have to have knowledge of everything that impacts the system performance outcome, so that when we look at it, it is not just necessarily a number. It is here is the metric... what are the restrictors to achieving that metric? What are the things that we can control? What are the things that we cannot control? What are the worst-case resources? Are there certain resources that we need, that are going to, because of non-availability or lack of ready availability that could impact that performance outcome? What is the availability of that resource? Is it lead-time? If I am not going to get there, what is the next option? What are the restrictions the customer must figure a way around?

Figure 16  
The Service Oriented Decision Process: The Construct



The field findings revealed a strong focus on knowledge management. This is for good reason; in the shift to performance, knowledge emerged as a source of continuous value creation. S-D Logic suggests that knowledge is the fundamental source of competitive advantage (Vargo and Lusch, 2004a). The grounded theory confirmed this suggestion. The shift to performance superordinated the role of service-oriented decisions as the fundamental *process* of competitive advantage. The ability of the network to sense and respond through service-oriented decision is the process of converting knowledge into value.

For the service-oriented network decision is the link between knowledge management and continuous value creation. What appeared to be the seminal insight of the service-oriented network theory involved how entities within the network make decisions, what enabled efficient decisions, and how the individual's mindset influenced the performance-orientation



decision process. The participants conceptualized this process as the ability to sense actionable knowledge and respond in a manner that impacts value.

The performance environment demonstrates a shift, a change in orientation, where the knowledge to value process subsumes the product based knowledge to product to value process. The empirical findings revealed that the service-oriented decision process is composed of two parts. The first part is the generation and dissemination of network wide knowledge in support of decision. This includes but is not limited to knowledge of customer, competitor, technological, environment, and supply chain. The second part is the influence of mindset on that knowledge management decision process. The following two subsections discuss these parts.

#### 4.4.1.1 Knowledge Management

The core elements of knowledge management in a service oriented network model are knowledge generation, knowledge dissemination, and decision (sense and respond). The grounded theory provided fresh structural conception for these well-documented marketing constructs (Jaworski and Kohli, 1993; Kirca et al., 2005; Kohli and Jaworski, 1990; Kohli et al., 1993). The investigation illuminates the process by which the service-oriented network model, enabled by knowledge generation in an actionable form, is able to convert knowledge to value.

##### 4.4.1.1.1 Service-Oriented Decision Process (Knowledge Generation and Dissemination)

The investigation found that the service-oriented network relies on knowledge as the “fundamental source of competitive advantage” (Vargo and Lusch, 2004a, p. 9). The model provides empirical support for S-D Logic’s contention that knowledge is a dynamic and evolving source of competitive advantage (Vargo and Lusch, 2004a):

Knowledge is highly important. You have to have it. Everyone needs to know clearly what the bounds of the performance parameters are. You need to know the supply chain knowledge... You have to know the supply chain at every step. You have to know the government and end user requirement. You have to know if the supply is going to be available in case I have to plan to surge. The prime needs to know that industry can fulfill that (requirement). The subcontract base needs to know what kind of demands are going to be put on me to where I have to help support. So you have to have knowledge that flows through kind of a circle.

The service-oriented network model proposes knowledge management as the central process in dynamic value creation. The empirical findings reveal how the structural shifts suggested by S-D Logic focus knowledge management, through a value metric, to provide continuous value creation. This shift affected all areas of the business. As proposed by S-D Logic, the investigation confirmed the move from product-based value to service based value increased the role of knowledge as an element of competitive advantage (FP4) (Vargo and Lusch, 2004a).

The analysis revealed the requirement for knowledge of customer, suppliers, technology, materials, processes and more. In transition from the product based industrial environment to the service based environment, actionable knowledge emerged as the raw material of the new economy,

Supply chain knowledge is critical. You have to know it at every step. You have to know the government and end customer requirement. You have to know if the supplies are going to be available in case the customer increases operational tempo. The integrator needs to know that industry can fulfill that. The supplier base needs to know what kind of demands are going to be put on them, the integrator needs to know where they have to help support that.

These sources of knowledge are similar to previous marketing studies dealing with technological orientation (Gatignon and Xuereb, 1997), customer orientation (Jaworski and Kohli, 1993; Kirca et al., 2005), supply chain as a source of innovation (Schrage, 2004), and competitor orientation (Lukas and Ferrell, 2000; Rindfleisch and Moorman, 2003):

It is really the functional aspect of managing those relationships. You have to make sure the right knowledge is getting to the right place, at the right time. Making sure that all of the actors and players that need the information have it. Understanding what is driving that activity, and what impacts the activity will have over the long term. Part of achieving the performance requirement is making sure that all understand the requirements.

Knowledge dissemination emerged as the inbound transportation of product to knowledge conversion factory.

P1: Increased generation of actionable knowledge positively influences sense and response.

P2: Increased dissemination of actionable knowledge positively influences sense and response.

#### 4.4.1.1.2 Service Oriented Decision Process (Sense and Respond)

The ability to sense actionable knowledge and respond through service-oriented decision emerged as the new production operation. The analysis illuminated the ability to sense and respond as the engine of performance-oriented (knowledge based) strategy. Sense appeared as the inclination to look for actionable performance-oriented knowledge to increase the probability that the decision response will achieve continuous value creation. Greater performance-oriented sense and response appeared as the evolutionary decision making process in a service-oriented strategy. The network factors that provide unconstrained solution sets positively influence the net work value proposition. Service-oriented decision response closes the knowledge management loop. In a performance-oriented strategy, knowledge conversion, through decision, forms the source of continuous value creation:

Like in the case of one of our programs converting to PBL, when we took a look at it, in order for people to do better work they needed better decision support tools. People make better decisions with better decision support tools.

The investigation provides actionable insight into the “challenges and current business practices emerging from corporate concern for value management within integrated global supply chains” (Flint and Mentzer, 2006, p. 139). The emerged knowledge, decision, continuous value creation process illuminates how in S-D Logic “supply chain management concepts would become subordinated to the management of value constellations and service flows” (Vargo and Lusch, 2004a, p. 14) throughout the network.

The investigation revealed the process of conversion efficiency of knowledge to value. The shift to a performance-oriented strategy created large-scale investment in decision support systems. Decision support systems provide efficiency and effectiveness (industrialization) of the knowledge based performance-oriented strategy. The investigation provides insight by which dynamic decisions supported by actionable network wide knowledge and flexible response structure operationalizes the competitive knowledge-discovery process (Hunt, 2000). The service-oriented decision process expects decisions today will likely, due to new knowledge, be different tomorrow. This decision of tomorrow is likely to improve the value proposition:

It is through the differential use of information, or knowledge, applied in concert with the knowledge of other members of the service chain that the firm is able to make value propositions to the consumer and gain competitive advantage (Duncan and Moriarty, 2006, p. 237).

Knowledge generation involves “effective market sensing and sharing of information” (Day, 2006b, p. 90) in support of an anticipatory structure for competitive moves and opportunities. The investigation showed how dynamic decision response allows the enterprise to dynamically create (FP7) value propositions (Vargo and Lusch, 2004a, p. 10). S-D Logic focuses on value in use. The investigation revealed how the performance oriented network focused on measures of performance (value in use), with an expectation that performance

(financial and system) will increase overtime. Value is generated through the application of operant resources in the servicing of the needs of the customer (Vargo and Lusch, 2004a). This infers a dynamic and evolving process. The service-oriented network model explicates how decision acts upon generated knowledge disseminated in actionable form to create continuous value. The service oriented knowledge management process is defined as:

Knowledge management is the central process of the service-oriented network model. Knowledge management requires the generation, and dissemination of actionable knowledge. The entity's sense and response converts that knowledge into effect that generates continuous value creation. The knowledge management efficiency is the value created by the decision divided by the resources consumed in the execution of that decision.

P3: Increased efficiency of sense and response positively influences the performance oriented decision process.

The second part of the service orientation process involves mindset. Mindset emerged as a moderator of the service orientation decision process.

#### 4.4.1.2 Service-Oriented Mindset

The grounded theory investigation emerged performance-oriented mindset as a moderating construct in the service-oriented decision process; that finding extends to the service-oriented network model. S-D Logic literature supports a service-oriented mindset construct. The mindset construct is composed of four elements. These elements are decision orientation, temporal perspective, adaptive ability, and network awareness. Network awareness replaces system awareness of the performance-oriented network theory:

Interviewer: so what is performance logistics? Is it a contract? Is it a business case? Is it a strategy? What is it?

I believe it is a mindset. I really believe that PBL today is personality driven. If you have intuitive knowledge of what PBL can do, yes you will do well at it. But if you are just learning what PBL is you will not be very good at it.

#### 4.4.1.2.1 Service-Oriented Mindset (Decision Orientation)

The analysis revealed that knowledge conversion, through the ability to sense actionable knowledge and provide efficient service-oriented decision response is the central process of a performance-oriented strategy. The grounded theory defined how mindset influences decision. While mindset is not a specific fundamental premise the S-D Logic framework the literature appears to suggest mindset. Mindset is captured as Jaworski & Kohli (2006) describes the concept of co-creating the voice of the customer:

In this co-creation process, the firm and the customers do the asking, listening, observing, and experimenting; that is, the firm and the customers engage in learning. The subject of study is customer needs/wants and firm needs/wants. The process results in the firm and customers knowing more about the needs/wants of the customer and the firm. Finally, after the process is complete, the firm and the customers figure out the goods and services that will be developed (or performed) by the firm and those that will be developed (or performed) by the customers. The co-creation process differs significantly from the process designed to hear the voice of the customer. In addition, it requires a very different mindset on the part of the firm and the customers, and calls for a different set of behaviors (Jaworski and Kohli, 2006, pp. 109-10).

Co-creating the customer voice involves a shift in how customers and the firm approach the value creation proposition. The service-oriented mindset optimizes decisions in a future orientation; this optimization aims at network level, long term, value generation. Service-orientation drives alignment toward a co-created value proposition. Jawoski & Kohli's (2006) co-creation conception, as supported by S-D Logic and as indicated by the grounded theory, is extendable to the network of firms. The entity in the service-oriented network adopts a decision orientation that is entrepreneurial. The goal is continuous value creation. That goal requires actor willingness to pursue a solution set tomorrow, informed by new knowledge, different from that today. These actors adopt an entrepreneurial decision orientation:

We are pulling information right now out of the legacy systems. We built a proprietary system where we could quickly pull the legacy system data and provide a better status to our resource managers. Our resource managers are being entrepreneurial.

Mindset influences the inclination to adopt a service-oriented decision. In the shift from product to performance, mindset also shifted from compliance logistics to what some called entrepreneurial logistics. Mindset was a remarkably ubiquitous segment throughout the analysis. Mindset is the lubricant of the knowledge conversion engine. S-D Logic anticipates an entrepreneurial mindset. The value potential of the discrete microspecialist (those in the value chain) are combined by the entrepreneur “to create the service that people want” (Vargo and Lusch, 2006, p. 53). The investigation supports Hunt & and Lambe’s (2000) suggestion of the role entrepreneurship plays as part of the competitive process ensuring knowledge endogenously generates continuous value.

The grounded theory highlighted the requirement for leadership to affect the service-oriented mindset. This finding gives substance to the assertion by Shugan (2004) that S-D Logic will be hard to implement as other business functions resist a marketing led re-orientation. Sawhney (2006) finds that the gain sharing arrangements required by S-D Logic will require a different mindset, particularly in purchasing organizations due to unfamiliar pricing approaches. Day (2004) expressed concern that firms will resist the shift to S-D Logic as they will have difficulty breaking cognitive path dependency. Day (2006b) also questions if consumers will engage in intimate marketplace relationships necessary for co-creation and that some consumers might avoid relationship specific assets. The grounded theory illuminated the manner in which successful, actualized, and gratified entities in a performance environment adopted an “entrepreneurial” decision orientation.

The service-oriented mindset is increasingly adroit, temporally agile, technologically savvy, and multitasking empowered. That mindset appears to have an affinity for evolutionary sustainment. This simple yet deep insight emerged in a number of subsequent interviews. These interviews gave distinct characteristic to the performance-oriented mindset. What is captured in this insight is not only the underlying structural shift associated with decision orientation of a performance-oriented strategy, but also a more economy wide generationally driven shift. There appeared to be a recognition that the younger generation may be more intuitively oriented to a performance-oriented decision mindset. With respect to the emerged theory, this confirmation provided theoretic saturation with respect to decision orientation.

P4: Increased entrepreneurial decision orientation positively influences the service-oriented decision process.

#### 4.4.1.2.2 Service Oriented Mindset (Temporal Perspective)

The service-oriented mindset focuses on long-term, continuous value creation. The analysis emerged temporal orientation as an element of mindset. There appeared a positive influence of past and future temporal inclination with respect to knowledge seeking, knowledge generation, and knowledge response. This inclination increases the amount of actionable knowledge generated to support a decision. This increase positively influences the probability that a performance-oriented decision will result in continuous value creation. Temporal orientation is the event horizon associated with a decision. Temporally oriented mindset is willing to go cross-temporal in search actionable knowledge. The grounded theory found focus on value required a mindset not limited by product-based contract:

You are going to need to switch things around and say okay, this may not be directly in the contract. But I will go do it even though it may cost me a little



money, but over the long term there is benefit; you're thinking over the long term versus the short term.

The investigation indicated the service-oriented mindset adopts a long-term perspective. This supports Vargo and Lusch's (2004a) link between long-term perspective, learning, continuous value creation, and coordinated network partnership. Hunt contends that the relational aspects of S-D Logic require firms develop "long-term relationships with stakeholders such as customers, suppliers, employees, and competitors" (Hunt and Madhavaram, 2006, p. 79). Flint and Mentzer (2006) refer to "long-term" 8 times in their article integrating value chain management and S-D Logic. Long-term focus in supply chain management is essential for consistent and satisfactory financial performance. Long-term perspective shifts financial perspective to continuous cash flows.

P5: Increased cross-temporal sense and response inclination positively influences the performance oriented decision process.

#### 4.4.1.2.3 Service Oriented Mindset (Adaptive)

The investigation revealed that the service-oriented mindset is adaptive. This mindset looks for signals in the environment and acts on those signals to improve system-level performance. This mindset seeks continuous value creation. The interview and analysis frequently centered on behavior (decision) which sought to rationalize new knowledge and awareness of the environment in a way that continually adapted decision today in a fashion superior to decision yesterday:

What I was telling my folks is the mindset has to change.

S-D Logic literature supports the grounded theory findings dealing with an adaptive mindset.

The service-oriented mindset looks for signals in the environment, and acts on those signals to

improve system-level performance (Hunt and Madhavaram, 2006; Lusch and Vargo, 2006b).

The entities investigated sought to rationalize new knowledge to continually generate decision today superior to decision yesterday:

We need policy that promotes partnering. That promotes PBL. It is at the (senior executive) level that they can be the change agents to take that story up. (a government actor) is ready to push outside of the box ready to go find me a rate that is competitive to partnering... Those are the guys we have talked about those are the guys that say hey things are changing, the environment is changing we have to adapt.

The investigation revealed a network structure which rests on knowledge enabled competition (FP4) leveraged through (FP1) the application of operant resources (Vargo and Lusch, 2004a). S-D Logic suggests iterative learning, that is anticipatory, adaptive, and dynamic (Day, 2004). The grounded theory investigation operationalization of S-D Logic reveals a dynamic, adaptive, and evolutionary process. That process is consistent with a service-centered view (Vargo and Lusch, 2004a) and resource-advantage theory (Hunt, 2004). Adaptive mindset is an essential element of a service-oriented network.

P6: Increased adaptive ability positively influences the service-oriented decision process.

#### 4.4.1.2.2 Service Oriented Mindset (Network Level Awareness)

The investigation revealed that the dynamism of the service-oriented approach achieves value by optimizing discrete decisions focused through network level optimization. In service-oriented network strategy entity mindsets that maintain system level awareness increases the probability of continuous value creation. The service-oriented strategy drives a shift in mindset where knowledge of the whole system ensures optimization of the parts:

It is the weapon system that should be the purpose. And one of the things that was the big challenge outside the (ZZZ system) family. Was that you would tell

people that you are willing to compromise, they would not believe you because they didn't have trust, but inside the (system) family. They would say great let's go do it we all believed you.

Network optimization requires a mindset that senses and responds with an awareness of the impact the decision has on the overall system. Mindset oriented toward system level awareness endogenously generates trust. More trust increases the probability that a decision will be more network optimal. By recursive logic, increased network optimal decision positively influences continuous value creation for the network partners. If the performance-oriented incentive structure is correctly aligned, continuous value creation reinforces “trust” based decisions. As such trust is not simply a normative societal value as inferred by the “family” reference. Instead the construct “trust” emerges as a performance-oriented network condition that leads to increased value for the network actors.

The service-oriented mindset maintains a network level awareness. The mindset is oriented toward long-term network optimized value creation. This is an essential aspect of the operationalized model of S-D Logic. The grounded theory investigation illuminated how the shift from product to performance required a process whereby discrete network wide decisions are oriented to network level continuous value creation. This requires a mechanism by which the mindset can unmask (FP2) the deleterious effects of indirect exchange (Vargo and Lusch, 2004a). For Vargo & Lusch (2004a) the use of value propositions overcomes the effects of microspecialization (FP2). The grounded theory investigation explicated how a network wide value metric (value proposition) achieves that requirement. The shift from product to service highlights the requirement for a (FP9) network wide integrator (Vargo and Lusch, 2004a). This integrator focuses the actor’s mindset on the overall value proposition:

Interviewer: so what is performance logistics? Is it a contract? Is it a business case? Is it a strategy? What is it?

I believe it is a mindset. I really believe that PBL today is personality driven. If you have intuitive knowledge of what PBL can do, yes you will do well at it. But if you are just learning what PBL is you will not be very good at it.

The structural shift in a performance-oriented environment requires new thinking “the right type of thinking.” The segment links the change in thinking as a change in behavior and a new type of culture. Leadership influences the shift to the “right type of thinking” and the right skill sets.” The system level awareness, coupled with performance-oriented incentives closes the loop through a sustainment “business cycle”:

And now we get into common themes. All this rambling has some meat in there. So your business decision cycle, and you're performance incentives, and you're performance outcomes have to be aligned. So if you can align those three things, your chances of success are multiplied immensely. So your decision cycles, and what you reinforce, and what you are trying to achieve are all aligned with an output type of metric. As opposed to some of these sub metrics, the transactional ones. Then you can optimize toward the end result that you really no kidding want.

The “business decision cycle” ties together knowledge generation, dissemination, and decision response process. The business decision cycle of performance logistics involves aligning performance incentive and performance outcome. Alignment increases the probability of success “immensely.” Network optimal occurs by aligning the decision cycles, reinforced incentive, and identifiable performance outcomes.

The grounded theory demonstrated the requirement for a service-oriented mindset that maintains network level awareness. This awareness optimizes decisions toward the network level value proposition.

P7: Increased network level decision orientation positively influences the service-oriented decision process.

#### 4.4.1.2.5 Service Oriented Mindset Summary and Definition

The grounded theory investigation revealed the role of mindset in a service-oriented network. The specific construct, mindset, is not part of any particular fundamental premise. Yet the S-D Logic literature suggests a role for an entrepreneurial mindset (Hunt and Lambe, 2000; Vargo and Lusch, 2006). The S-D Logic literature describes resistance to adopting a service orientation (Day, 2006b; Sawhney, 2006; Shugan, 2004). This resistance implies a mindset, one that the network leadership must overcome. The service-oriented mindset is adaptive, capable of generating new, knowledge enabled, solutions that are different from yesterdays solutions. That mindset requires a network level perspective. The grounded theory investigation emerged the construct mindset; the extant S-D Logic literature supports mindset as a discrete variable. In a service-oriented network mindset is:

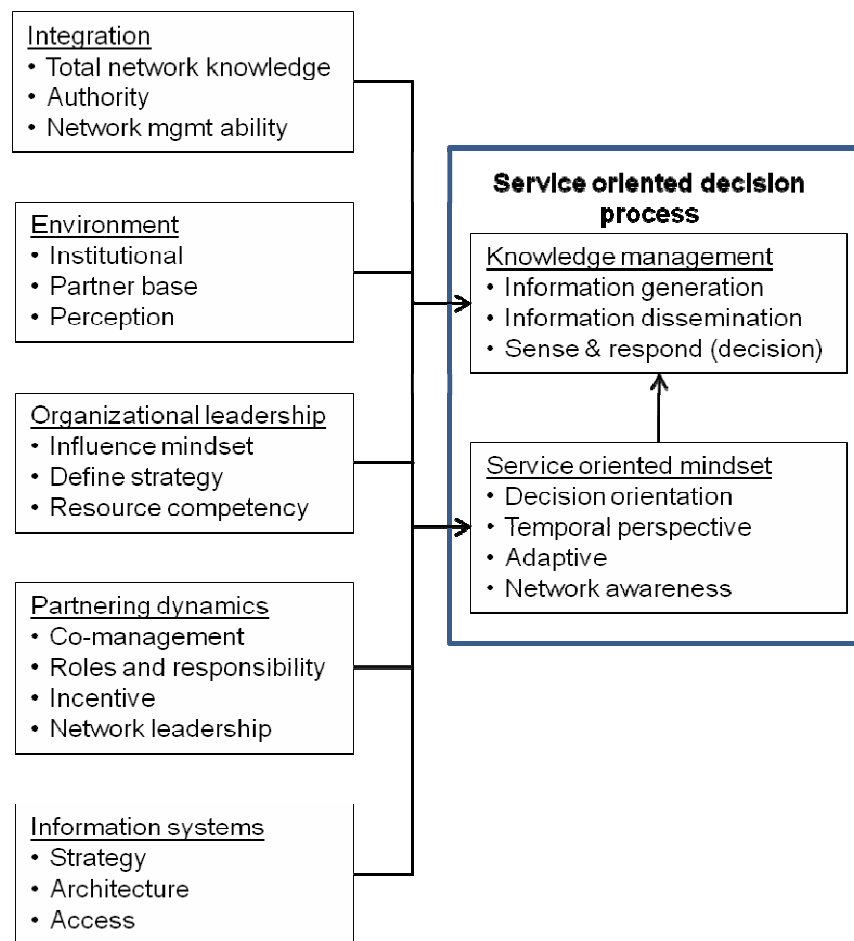
The service-oriented mindset influences the decision outcome. The mindset governs the manner in which decisions are made. The service-oriented mindset seeks entrepreneurial solutions focused on long-term value creating effects. The mindset adapts as new knowledge enables more efficient solutions. The mindset is focused through network wide awareness.

The service-oriented decision process composed of knowledge management and service-oriented mindset emerged as the central process of the service-oriented network model. This process, like all processes, results in conversion. This process converts generated and disseminated knowledge through decision into continuous value creation. The service-oriented mindset of the entities influences this process. This process has structural antecedents that largely shape the dynamics associated with any particular performance-oriented network. The next section discusses the antecedents of the service-oriented decision process.

#### 4.4.2 Antecedents of the Service-Oriented Decision Process

Figure 16 presents the service-oriented network model. The grounded theory investigation suggests this model as the operationalization of S-D Logic. The investigation into a performance-oriented network empirically informed the model. The S-D Logic literature integration further rationalized the model. The model presents the antecedents of the service oriented decision process, the service oriented decision process, and the outcome of the service oriented decision process. This section assesses each of the constructs and develops hypotheses empirically informed by the grounded theory and rationalized with the literature.

Figure 17  
The Antecedents of the Service-Oriented Decision Process



The antecedents of the service-oriented decision process are network and extra-network factors that impact the implementation of the service-oriented decision process. These antecedents represent network level macro marketing constructs and relationships. The network model reveals macro level antecedents that encapsulate micro level activities. In this fashion the model resolves the concern that S-D Logic explain micro level interests from a macro perspective (Wilkie and Moore, 2006).

#### 4.4.2.1 Integration (Total Network Knowledge, Authority, Network Management Ability)

During the analysis a group of senior aerospace sustainment managers critiqued an initial draft of the emerging framework. One of the participants, a senior engineer, sat back quietly for some time and then stated, “you’re missing something here. You’re missing how all this comes together, how it is integrated.” This was a tremendous insight. That insight, captured against the backdrop of the emerging theory, revealed in a theoretical manner the initial structure of integration. That meeting resulted in the creation of the integration set of codes. Follow-on interviews and analysis saturated the integration category by exploring questions such as what is the role of integration, who should perform integration, why, and what integration required.

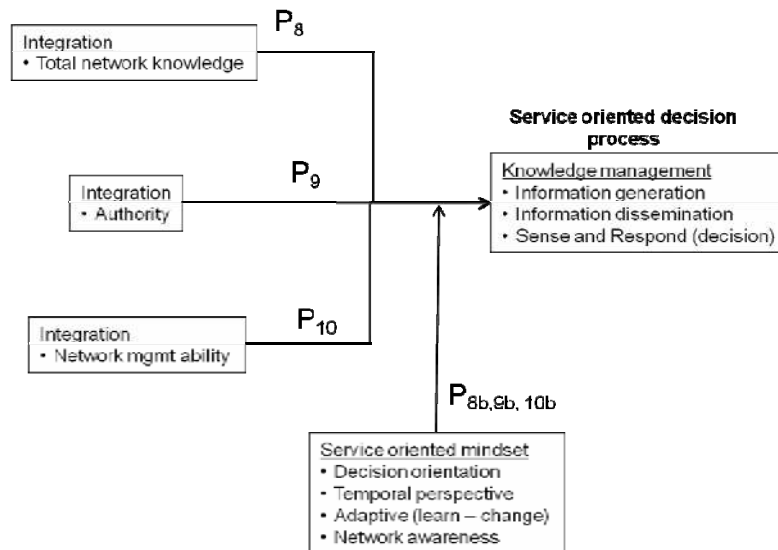
So how do we take the industrial base that we have and see how that fits into our global supply chain system that we are putting together? And that is really what I am looking at, it is putting that, I always use the term business wrapper around our supply chain. Because we are selling a service ultimately. Not parts. You know we are in it to make a profit, but also bring a reduced cost for sustainment to the government.

The integrator put the “business wrapper” around the sustainment-oriented service. The business wrapper function is performed by an entity that can see the enterprise; “our global supply chain.” From this perspective the integrator is “putting together” the parts. The

segment states that the global supply base, the network, is integrated to provide a “service, not parts.”

The grounded theory analysis revealed integration as a definable construct that influences the service-oriented decision process. S-D Logic literature identifies integration as the 9<sup>th</sup> fundamental premise (Vargo and Lusch, 2006). The grounded theory generated three elements of integration. The elements are network knowledge, authority, and network management ability. Grounded theory and the S-D Logic literature support the inclusion of integration as an antecedent of the service-oriented decision process.

Figure 18  
Integration Related Propositions



#### 4.4.2.1.1 Integration (Network Knowledge)

The first subcategory of integration is network knowledge. Network optimized, discrete, decisions are focused by network level understanding. The investigation confirms Vargo and Lusch’s (2004a, p. 11) suggestion that (FP8) the customer-centered view requires “interactivity, integration, customization, and coproduction.” Day (2004, p. 19) claims that pursuing a true



solution requires deep supplier integration which “transfers that specific supplier’s skill and knowledge to a customer.” This deep understanding requires network level awareness. The building and sustaining of network wide continuous value creation requires knowledge of how the parts influence the whole:

We have a number of complex issues, diminishing manufacturing source and material related challenges in all of that. You (the integrator) would have to see that, I would be skeptical that someone who hadn’t demonstrated a significant body of experience could suddenly come in and say I will be the integrator. Okay show me.

The investigation revealed that in many cases integration falls to the system designer. The designer typically has the most knowledge of how to continually improve the product, or create a follow-on improved product. However this is not always the case. In some cases the integrator is an entity, such as the government sustainment center, that is closer to the customer. This finding is consistent with Vargo & Lusch’s (Lusch et al., 2007) premise that for consumer goods the retailer is the most effective integrator.

Network efficiency and effectiveness requires an integrator capable of linking decision to some performance metric and then provide feedback to the network entities on how their decision impacted that value. The integrator brought the network together through systems and norms in a manner that reduced the transaction costs and generated greater value in comparison to transactions in the firm or market. This is consistent with previous research dealing with transaction cost and the implication of normative values in the channel (Heide and John, 1992).

The structure of the model supports Day’s (2006a, p. 96) hints at the theoretical structure behind integration, “sometimes the valuable resource is an adroit combination of

capabilities, none of which is superior on its own, but when taken together makes a better package.” S-D Logic requires integration and interaction that results in network optimized commitments; these commitments include knowledge exchange, investment, co-ordination, and risk absorption (Day, 2006a). As shown by the investigation integration requires a network wide understanding and optimization through that understanding.

Coase (1937) stated that the firm exists as long as some transactions are accomplished more efficiently in the firm than the market. As the firms continued to generate transaction, efficiency firms continue to grow. At some point the increase in firm size creates a marginal burden that does not outweigh the marginal value. In a similar fashion the grounded theory investigation predicts, based upon efficiency, where transactions occur. Coase (1937) described the firm as generating efficiency with respect to contract, contract enforcement, and other such product-oriented related activities. The grounded theory investigation extends this finding to the network. Similar to Coase’s (1937) entrepreneur, the integrator provides efficiency by bundling and focusing the exchange of operant resource toward some performance goal.

Vargo & Lusch (2006, p. 52) contend that if a “person is an expert on multivariate statistics... this person will infrequently run across people who want the direct application of his or her services.” Vargo & Lusch (2006, p. 52) state that these microspecialists are “inputs the entrepreneur combines to create services that people want.” The integrator for Vargo & Lusch is the entrepreneur. This research explains how the integrator efficiently employs system level knowledge, authority, and network management ability combine, recombine, and evolve service in pursuit of an evolving value proposition.

The research provides empirical support for Vargo & Lusch's (2006) suggestion that the integration construct of a service-oriented network may provide a foundation for an exchange theory. By garnering support for a value metric and its decomposition the integrator takes the price mechanism out of the direction of resources. The service-oriented network model shifts from a focus on cost to a concern with value provided by network level exchange activities. As the integrator acts more efficiently than the market or firm by decomposing the metric and then assigning and rewarding to discrete knowledge based transactions based upon that decomposition, the network learns. The research provides the method through which this decomposition reveals learning previously obfuscated due to monetization's effect on indirect exchange (Vargo and Lusch, 2004a). The grounded theory supports Vargo & Lusch's (2004a; 2006) suggestion that the integrator may reshape classic approaches to quality management.

This explanation can be represented mathematically. The integrator functions to leverage network knowledge based resources in manner that results in more efficient value proposition creation than possible in the firm or open market. In general transactions move to the network as the network integrator generates more value versus resources consumed in either the firm or the market. In this function the integrator does away with classic approaches to quality management. The efficiency of the integrator is captured theoretically as:

$$KC_{ef} = \frac{(\sum V_i) / M_n}{(\sum R_i) / M_n}$$

*KC<sub>ef</sub> – the knowledge conversion efficiency of the decision > 1*

$\sum_i^m V_i$  = *the perceived value created by the decision*

$$\sum_{t=1}^n R_t = \text{perceived resources consumed by the decision}$$

$m$  = unit of time the value is created

$n$  = unit of time resources are consumed

$\alpha_t$  = some coefficient of increased network efficiency through integration

$\beta_t$  = some coefficient of resource burden of the integration function

The integrator acquires and disseminates network level knowledge in an actionable form. The mindset of the decision maker influences how the decision maker will act upon that knowledge.

The integrator focuses on network optimized continuous value (Vargo and Lusch, 2006).

P8<sub>a</sub>: Increase network level awareness positively influences the service oriented decision process.

P8<sub>b</sub>: Increase in the service oriented mindset positive influences the effects of system level awareness.

#### 4.4.2.1.2 Integration (Authority)

The grounded theory explicated how integrator authority positively influences the service-oriented decision process. In a service-oriented strategy, integration requires authority implement decision across the network to support network optimized continuous value creation. This finding is similar to the role of the integrator as suggested by S-D Logic (Lusch et al., 2007). The following segments from the grounded theory illuminate the role of authority:

I (the government) will have to give you (the contractor) some authority to order spares, or to determine what the correct right spare levels are.

The problem we have, if you really want to have a performance-based logistics, if I want you to maintain my weapon system, you are going to have to give you some authority.

These findings extend to the non-government market place. Picking up on the retailer as the integrator (Lusch et al., 2007), the previous segment can be adapted:

I (the manufacturer) will have to give you (the retailer) some authority to order stock, or to determine what the correct stock levels are.

The problem we have, if you really want to have a service-oriented network, if I want you to help provide my end customer service, you are going to have to give you some authority.

Authority is a key attribute of integration. Effective integration requires flexibility and insight from which to manage the entire network. Product centric authority is delegated through contracts, memorandums of understanding, and policies. The use of preplanned structures, constrained response, and limits on adaptable roles and responsibility appears antithetical to performance-orientation. Performance-oriented integration authority (or its delegation) is structured to support dynamic decisions and positively influence continuous value creation.

The grounded theory and the S-D Logic literature indicate that authority is an essential aspect of integration. Both the grounded theory and the S-D Logic literature find that the assignment of the integration role can be a “sensitive” discussion. The integrator has an inherently superior competitive position (Lusch et al., 2007). The integrator is required to co-create with customers and network members (Lusch et al., 2007). The mindset of the network actors affects their ability to take that authority, accept that authority, or release that authority.

P9<sub>a</sub>: Increased integrator authority positively influences the service-oriented decision process.

P9<sub>b</sub>: Increase in the service-oriented mindset positively influences the exercise of authority.

#### 4.4.2.1.3 Integration (Network Management Ability)

The investigation revealed that integration in a service-oriented strategy aligns the network toward the aggregate level performance goal. The integration function requires knowledge, authority, and ability to focus the network on the performance goal. Network

management's ability is a key factor associated with decomposing performance outcome metrics and translating that performance outcome to the appropriate actor. Learning requires the integrator rotate the tiers of supply chain and focus network wide activities on the desired performance.

Effective integration requires the ability to affect network functions. The grounded theory explicated integrator involvement in the co-creation of the value metric. The integrator plays the central role in generating, decomposing, and assigning accountability for the metric. This emerged as the critical link between network activities and continuous value creation. The integrator ability to decompose the value of network activities is required to generate market based learning. Learning occurs through the feedback mechanism associated with that decomposition process:

So, of course the risk flows down with the metric. But we wouldn't just get pay a dollar per flying hour, we would be pay a dollar per usage that is surrounded by a certain number of performance metrics that the supplier has to comply with. It is almost a pass through down to that subsystem. But we hold them responsible for looking at it always from an enterprise perspective.

These findings support Vargo & Lusch's (2006, p. 53) suggestion that integration is "one of the most important operant resources in society and economy." The efforts of the integrator result in endogenous, that is continuous, value creation. Integration is the foremost operant resource in that it is the integrator that combines network wide knowledge and skills focused through a value network (Lusch et al., 2007). The investigation revealed management ability as distinct from authority and awareness. Authority and awareness does not necessarily imply an ability to integrate network activities. Competitive advantage rests in the ability to integrate skills, knowledge, and supply chain members in a manner cognizant of the entire network value

potential (Vargo and Lusch, 2004a). Network management ability is the third category of integration. The service-oriented mindset affects the inclination to exercise ability in a decision-making role, or to be affected by ability in a decision-making role.

P10<sub>a</sub>: Increased integrator ability positively influences the service-oriented decision process.

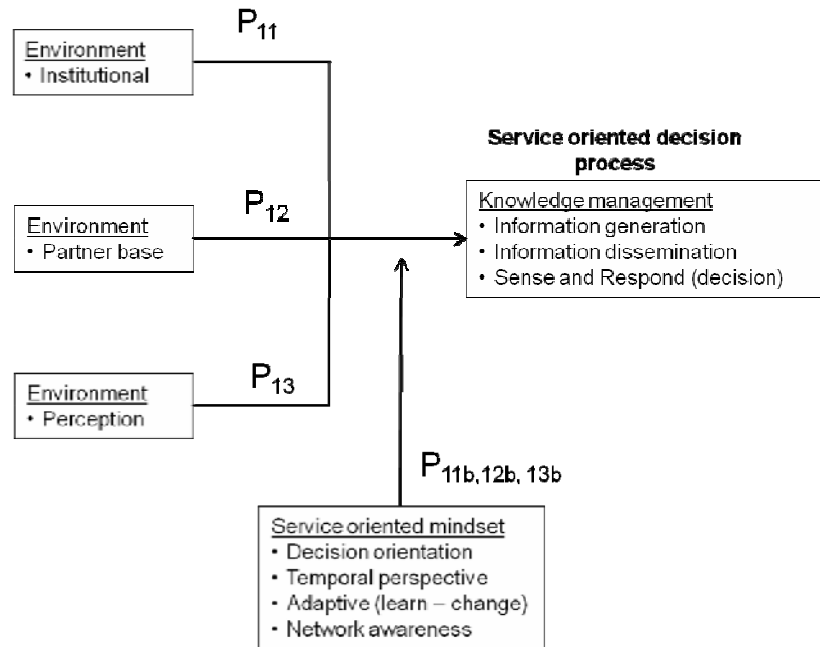
P10<sub>b</sub>: Increase in the service oriented mindset positively influence the exercise of ability.

For Vargo and Lusch (2006, p. 53) fundamental premise 9 “implies that S-D Logic could provide a framework for a theory of the firm.” Fundamental premise 9, taken with this investigation and considered within the context of the service-oriented network model appears to support S-D Logic as a foundation for the theory of the network. That theory may be network transaction value analysis. It is the integrator that performs that value analysis in search of continuous value creation.

#### 4.4.2.2 Environment (Institutional, Partner Base, Perception)

The grounded theory investigation revealed environment as an antecedent to the service orientation decision process. As shown in section 4.2 macro environmental factors impact decision. Environment is composed of three elements. These are institutional, partner base, and perception. This is a slight shift from the performance-oriented network theory where four environmental factors emerged. One of those factors, financial policy, emerged as a distinct constraint for the government. In shifting to a conceptual and potentially more generalized model that factor falls under institutional factors. Additionally the service-oriented network model employs a more generalized term of partner base in place of supplier base.

Figure 19  
Environment Related Propositions



#### 4.4.2.2.1 Environment (Institution)

Institutional factors emerged as a significant influence of the service-oriented decision process. The grounded theory investigation demonstrated how institution tended to constrain decision. The general conception is that institutional factors, at the macro-marketing level, are aimed to have overall positive impact on society. At the network level these factors may have a negative impact on continuous value creation. For instance policy requires a “50/50” depot work sharing. That requirement is public law with respect to military depot infrastructure. At the macro level the law ensures that the US has sufficient military specific infrastructure in the event of large-scale conflict. From the network perspective this requirement constrains source of repair. In the segment below institutional constraint (50/50) is further complicated by financial flexibility constraints (institution):

I think you should be able to incentivize a government depot. You need to be able to incentivize them monetarily like you do a contractor because what you are asking them to do is to go out and investigate parts to increase reliability. So if you don't have incentives that won't happen. What you want to do is the



depot takes that that money for excellent performance and you want them to reinvest it into your weapon system. And unless they get that extra money it's going to be business as usual where they have to get your requisitions along with the rest of the requisitions and bring things back to specification.

In some cases the actors expressed a degree of frustration as a result of the constraints. These actors sought to optimize solutions within those constraints, such as depot partnering, or obtaining a waiver to institutional rules for incentive.

One program manager wanted to reinvest savings that the depot workforce generated as an incentive for that depot workforce. The incentive in this case would purchase more effective test equipment, which would generate future savings. In another case the integrator wanted to use some of the savings to provide tangible incentives to the depot workforce such as a bonus or an XYZ program funded refrigerator with a sign that says "thanks for the great support." In both cases the stakeholders associated believed that the use of the incentive generated greater long-term value for the taxpayer. However, legal interpretation (environmental factor, institutional constraint) determined that Federal Acquisition Regulations (FAR) did not allow the use of working capital funds (funds set in a revolving account specifically designated for repair) to be used for incentive:

Our monetary remedies (award fee) had to be taken out,... because of working capital fund issues, and right now the regulations, the FAR, and statute say the working capital fund cannot be used as incentive. Working capital fund has to be a revolving fund, it cannot be added to or taken from.... I was trying to provide money to (the DoD repair facility) for excellent performance, but that would be giving them money for what the lawyer say is "no real work done." So you're not getting any kind of product even though we could justify it by saying we get increased performance. They don't see it that way. What they think is that we need to go to Congress or OSD and get that changed or get a waiver for that particular regulation in order to be able to properly incentivize the contract. So that will be next year.

The product-orientated mindset imbued policy compliance is reflected by the statement “not getting any kind of product even though we could justify it by saying we get increased performance.” This segment reveals a strategy developed by the organization adapting to the performance-oriented environment. The text segment reveals how institutional factors constrained implementation of the desired strategy. The finding that there is “no real work done” as supported by law, may well have its basis in a cost interpretation. From a performance-oriented view incentive makes intuitive sense. Yet the “regulation waiver” will come later and thus delays implementation of the service-oriented strategy as policy adapts at an understandably slower pace. Policy is further from the changing environmental forces.

These findings support S-D Logic literature suggestion that institutional factors influence network performance. Levy (2006) states the S-D Logic is positioned well to capture the broadening of the marketing concept to include government. Wilkie and Moore (2006) insist that any marketing framework must address government and public policy, they point out that the policy decisions may constrain actors but benefit macro society. The impact of institution is suggested mathematically by considering environment as constraining optimal decision response. This implication can be represented mathematically:

$$VLNI_t^m = VCD_t^u - VCD_t^c$$

*VLNI<sub>t</sub><sup>m</sup> = Value lost to the network due to the environmental constraint*

*VCD<sub>t</sub><sup>u</sup> = equals value created by the unconstrained decision (a multi – year contract)*

*VCD<sub>t</sub><sup>c</sup> – equals the value actually created due to constraint (multiple year contract)*

*VGSI<sub>t</sub><sup>d</sup> = the societal good generated by the institutional constraint*

The service-oriented network model assumes that the decision maker is aware of network optimal decision:

$$YCD_i^*$$

However the optimal decision:

$$D_i^*$$

is constrained by some environmental factor (e.g., tariff, tax, or regulation). Therefore, the decision maker implements the second most optimal decision:

$$YCDF$$

From a public policy perspective the impact of policy on the network and the aggregate macro-marketing structure is positive if the aggregate level good is greater than the cost impact of the policy. This can be represented as:

$$\sum_i^N VGSI_i^d > \sum_i^M VLNI_i^m$$

As pointed out by Wilkie and Moore (2006) the macro level policy is “good” if the summation of network value lost due to the particular constraint is less than the value created for society by the institutional constraint. This supports the grounded theory findings where the actor shifting to a performance-oriented strategy reevaluated policy with an eye to how that policy impacted continuous value creation. The grounded theory emerged, and the S-D Logic literature supports, institutional factors as an antecedent of an operationalized model of S-D Logic. The model presents the processes by which macro level institutional factors impact the micro decisions, and the network level outcomes. The service-oriented model is taken as a “network

of networks”, inclusive of institutional impacts and illuminating of the aggregate level marketing system suggested by literature (Wilkie and Moore, 2006).

P11<sub>a</sub>: Increased institutional constraint decreases the effectiveness of service- oriented decision process.

P11<sub>b</sub>: Increase in the service-oriented mindset mitigates the impact of institutional constraints.

#### 4.4.2.2.2 Environment (Partner Base)

The investigation revealed that actionable knowledge improves the probability of continuous value creation and that generating increased actionable knowledge increases the probability of continuous value creation. The supplier base represents an immense reservoir of actionable knowledge. Threats to that reservoir threaten continuous value creation. The grounded theory investigation emerged partner base as an environmental factor. The core construct of the service-oriented decision process is knowledge conversion through and ability to sense actionable knowledge and respond with an effect that generates increased value. Increased actionable knowledge positively influenced the knowledge conversion process. Increased knowledge, applicable to a specific decision, increases the probability that the decisions generate positive effect and lead to continuous value creation. The investigation supports the S-D Logic suggestions that a key source of knowledge comes from partners both the customers (FP6) and other members of the network (FP9) (Vargo and Lusch, 2004a):

Interviewer: Who is most capable of doing that (improve reliability or improve repair procedure?)

The vendor in my opinion. The vendor is most capable of fixing the product, they know so much.

The partner base represents potential knowledge based resources for the network. The partner base provides complementary resources that augment core capability and lead to cost and/or

differentiation advantage. This finding is consistent with resource advantage theory and similar theories of competitive strategy (Hunt and Lambe, 2000; Porter, 1980). The grounded theory demonstrated, as suggested by S-D Logic literature, that the network draws on the “competencies of their supply chain” (Prahalad and Ramaswamy, 2000, p. 80). The investigation found that the network may find knowledge of innovative solutions outside the network, or at the edges of the supply chain. This finding supports the views of Deighton and Narayandas (2004) who assert that the shift in the market represents a reconceptualization as parties to exchange becomes partners to exchange. For S-D Logic “network partners represent core competences that are organized to gain competitive advantage by performing specialized marketing functions” (Vargo and Lusch, 2004a, p. 5). The customer as a partner also impacts the network value proposition (Vargo and Lusch, 2004a).

The macro-environment largely establishes the customer value potential in spending, lifestyle, inclination to partner, wealth and a number of other extra-network customer partner base variables (Sawhney, 2006). As new networks form or old networks evolve the number and quality of potential partners in the macro environment shape the microenvironment. The grounded theory investigation illuminated that current and potential partner pools impact the service oriented network ability to generate continuous value. A service-oriented mindset may mitigate the impact of decreased regional partner base. Santos (2004) suggests that your global vendors may have other products developed in other markets that may provide your network unsuspecting value. For Santos (2004) more open vendor relationships may provide serendipitous solutions for you network. The grounded theory investigation found partner base is an antecedent of the service-oriented decision process.

P12<sub>a</sub>: Reduced partner base (knowledge) decreases the effectiveness of service oriented decision process.

P12<sub>b</sub>: Increase in the service oriented mindset mitigates the impact of reduced partner based.

#### 4.4.2.2.3 Environment (Perception)

The investigation revealed that the performance-oriented strategy shift has generated a number of perceptions. In general the analysis indicated that perception presents an environmental factor that influences the execution of a performance-based strategy. Increased environmental support (financial, policy, guidance, commitment) positively influences the ability of the network to generate continuous value creation. In some cases, the analysis indicated that perception influenced this support.

The grounded theory indicated that macro level perception can influence network specific value creation. The interviews acknowledged a number of perceptions dealing with performance-oriented strategies. Some of these perceptions are informed and generally support network efforts at continuous value creation. Others are not as informed and negatively impact the value proposition without rational basis. In general, the analysis indicated that perception presents an environmental factor that influences the execution of a performance-based strategy:

Interviewer: In a pay for use environment, for that to happen most effectively you have to get paid not to repair parts?

Yep. That's right.

Interviewer: and that just freaks people out, (why)?

I don't know, it is what I have struggled with too. It just makes such perfect sense to me. But....I just, I don't know. I know you'd like to get this wonderful answer from me. I guess having not been in the military and lived on the other side of

the fence. That is why I struggle with it so much. I'm with you and I just think about it and I go well that would be fantastic.

This concern with perception is not limited to a performance sustainment strategy, describing the barriers to an S-D Logic strategy Sawhney suggests:

The barriers to adopting gain-sharing arrangements include the difficulty in objectively measuring the value created by solutions, resistance from purchasing organizations to using unfamiliar pricing approaches, fears of owing the solution provider a lot of money if the projects are too successful, and the lack of trust between solution providers and customers (Sawhney, 2006, p. 377).

The investigation suggests perception may impact ability to generate support for the value proposition. Perception, or even fear, may limit continuation of the value proposition, even though such a strategy would result in improved capability. Change that enables such service-oriented strategy requires a shift away from compliance and product oriented transactional contracting, to a more performance-oriented, trust based relationship. Such trust based transactions is illuminating of what Oliver (2006) calls “mutually satisfying consumption.”

The idea that industry will, during some period, get “paid to repair nothing” “freaks people out” and negatively impacts support for the performance-based strategy. A myopic focus on cost type accounting exacerbates this perception. The segment reveals both the intuitive nature of a performance based strategy, and yet a quizzical concern for why the strategy is not universally intuitive.

For those acculturated in cost accountability orientation the pay for value or performance approach is incomprehensible. Note the inflection generated in the choice of words, “It just makes such perfect sense to me. But (pause in the recording) I just, (pause) I just don’t know.” The concern flows from the segment, “that is why I struggle with it so much..... it

would be fantastic.” Recall the earlier segment with the CEOs and CFOs they also understand the “fantastic” potential opportunity of a performance-oriented approach.

The attraction to a performance-oriented approach is a realization that such strategy is inherently win-win. There is also an undercurrent of desire to do things a better way. Change that enables such strategy therefore requires a shift away from compliance and product oriented transactional (cost type) contracting, to a more performance-oriented value based relationship. The ability to make decisions, which positively influences continuous value creation may be constrained by environmental factors. Moreover these factors may be as simple as perception.

P13<sub>a</sub>: Increased positive perception of service-oriented strategy positively influences the service oriented decision process.

P13<sub>b</sub>: Increase in the service oriented mindset mitigates the impact of negative perception.

This grounded theory demonstrated how institutional factors, partner base, and perception impact the service-oriented decision process. The shift to service-oriented strategy requires network leadership to at least be aware of these macro level effects, and effectively use resources to influence these variables. The inclusion of environmental factors as an antecedent to the S-D Logic service-oriented decision process is supported by the grounded theory, the S-D Logic premises, and the S-D Logic literature. The ability to make decisions, which positively influences continuous value creation, can be constrained by environmental factors. These factors may be as simple as perception.

#### 4.4.2.3 Organizational Leadership (Influence Mindset, Resource Competency, Define Strategy)

The grounded theory investigation suggests the manner in which firm leadership factors influence the service-oriented mindset, and the service-oriented decision process. Firm

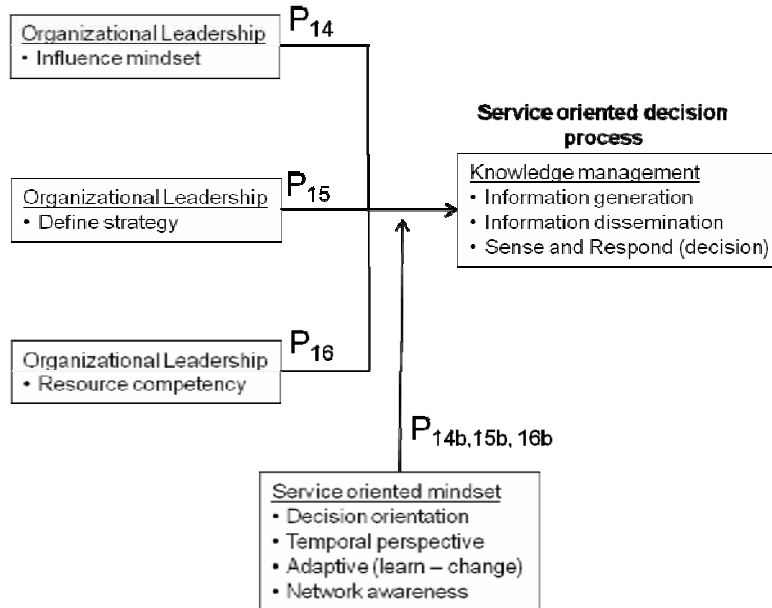


leadership stimulates a performance-oriented mindset, and increases network optimized decisions:

I had a briefing where I told our buyers. The buyers are used to just buying parts for the product, and then building the product; and that is it. I had to stress to them, that their job now is a 30 year job. Now every month they are worried about parts moving around and meeting our performance standards. Because that is what we are getting paid on now, we are not getting paid on the parts that are breaking. It is going to take time for them to grasp that.

The firm leadership harmonizes firm strategy with the network strategy. Service-oriented leadership seeks to make decisions as to how to resource competencies to achieve greater performance outcome. The firm leader links the network performance network with firm performance metrics.

Figure 20  
Leadership Related Propositions



#### 4.4.2.3.1 Organization Leadership (Influence Mindset)

The investigation revealed that the firm leadership plays a primary role shaping the mindset of the organization. The firm leadership ability to shape the organization mindset in a performance-oriented fashion positively influences the performance oriented decision process:

I have witnessed firsthand here in the organization as the PBL execution goes down below the firm leadership level they do not support it, or just don't get it. And most part they don't get it because they have not been educated.

Interviewer: So there is a component that, earlier you said leadership, so you think there is a deliberate component of this that you must re-educated those who can either touch it (PBL) get in the way of it, or impact it?"

Absolutely absolutely, and they must be the people that have specific actions that contribute to the ability to impact PBL performance.

Some members of the firm do not "get" the shift to a performance-orientation. In comparing the grounded theory investigation with the literature, mindset appears similar to, yet distinct from organizational culture (Deshpande and Parasuraman, 1986; Deshpandé and Webster, 1989; Kohli and Jaworski, 1990; Narver and Slater, 1990). The participants spent little time discussing culture. Those making the shift to a service-orientated strategy perceived culture as a more static phenomenon. They opted instead to focus on mindset, which tended to be more dynamic. This made inductive sense; mindset demonstrated a more explicit link to the knowledge, value, and conversion processes. The shift from a product strategy to knowledge enabled service-oriented strategy, amplified the criticality of mindset. The theoretical sampling demonstrated that disparate mindsets could, and typically did, coexist in the same firm culture. The different mindsets were part of the same culture. As such, culture as a variable, did not emerge as an actionable construct in the grounded theory. Mindset did emerge as an actionable construct closely linked to firm leadership.

We should take a cadre of people out of the organization, and train them to think like this for a year. I'm not talking about some executive class I'm talking about teaching them how to think differently. We could then bring those people back and place them strategically throughout the organization in hopes of spreading that mindset.

The mindset construct and the link to leadership finds strong support in the S-D Logic literature:

Organizations can reinvent themselves as “service” organizations and develop a service culture by treating employees as the type of resources they are—pure operant resources, rather than operand resources. Reinventing the firm as a service organization using S-D Logic requires the organization’s culture and its leadership style to treat employees as operant resources. The leadership of many G-D logic organizations is based largely on the manipulation of rewards and punishments and is, accordingly, a coercive form of leadership. It is also based on asymmetric information with the leader and organization holding much information private and out of the reach of employees and, in turn, employees reacting similarly and withholding vital information from management. Employees are viewed as replaceable operand resources and treated largely in a transactional mode. It is not surprising that these firms find themselves unable to compete and, as such, laying-off or ridding themselves of their most important resources (Lusch et al., 2007, p. 15).

If knowledge is an operant resource, and the core process of knowledge conversion to value is decision, then that mechanism is an operant resource. The employees, who perform that knowledge to value conversion function, are the most operant of firm resources. The grounded theory explicates leadership as an actionable construct creating the service-oriented decision mindset of the employee; mindset is the operant resource. The grounded theory specifically illuminated the angst of the performance-oriented employee trapped in a product-oriented environment. Further the grounded theory illuminated how this angst became an entrepreneurial gratification in a service-oriented strategy.

Prahalad and Ramaswamy (1986; 1990; 2000; 2004b; 2003) has long commented on the organizational psychological factors in a knowledge / experiential approach to exchange. They link decision mindset agility with competitive advantage, noting “the ability to amplify weak

signals, interpret their consequences, and reconfigure resources faster than competitors, will be a source of advantage. It's not just "running faster" but "thinking faster and smarter" that matters" (Prahalad and Ramaswamy, 2000, p. 86).

The service-oriented network is knowledge based. For S-D Logic, knowledge is the fundamental source of competitive advantage (Vargo and Lusch, 2004a). Decision converts network wide knowledge into value. The grounded theory and the S-D Logic literature indicate that some entities easily transfer into the service paradigm, naturally adapting the service-oriented mindset. The leader's most difficult task, and most operant creative task, is generating that mindset in the rest.

P14<sub>a</sub> Increased service-oriented leadership positively influences the service oriented decision process.

P14<sub>b</sub> Increase in the service-oriented mindset positively influences the effects of service-oriented leadership.

#### 4.4.2.3.2 Organizational Leadership (Define Strategy)

The leader's influence on the service-oriented strategy has a direct impact on continuous value creation. In the service-oriented paradigm knowledge-decision-value creation is a firm strategy. Firm strategy is the domain of organizational leadership.

The grounded theory investigation revealed the link between firm leadership and definition of firm strategy. Leadership generates strategy; strategy affects information systems, partner sharing protocols, integration interface, environment response, and numerous other strategic categories. In the service-oriented network firm leadership aligns the individual firm's strategy most efficiently and effectively with the network strategy:

Right now there are a couple of depots that are looking at how they structure their rates in order to make themselves competitive enough to offer a good deal.

The senior leadership of these government agencies recognized how a shift to service-oriented strategy impacted their organization. These leaders recognized they had resources to succeed in a knowledge-based network, however these resources were not efficiently bundled for the new service-oriented environment. The leaders recognized that the shift required adoption of new strategy. The investigation suggests that leaders resource competencies that supports long term competitive advantage in an S-D Logic environment (Vargo and Lusch, 2004a).

The investigation found support for S-D Logic suggestion that (FP1) the application of specialized skills and knowledge is the fundamental unit of exchange, and (FP4) knowledge is the fundamental source of competitive advantage (Vargo and Lusch, 2004a). The organic agencies possess extremely high levels of mechanical, metallurgical, electrical, hydraulic, and a variety of other touch labor skills. The organic core competence of repair and touch labor, along with extensive infrastructure represent tacit and tangible operant sources of value. However ability to bundle these offerings to meet the needs of the particular network required a reorientation of strategy similar to the suggestions for S-D Logic (Brown and Bitner, 2006).

The grounded theory investigation supports the suggestion that S-D Logic is coherent with resource advantage theory. Resource advantage theory considers resources “bundles of potential service” (Hunt, 2002, p. 270). The role of leadership is then to most effectively and efficiently create these bundles as value propositions for the network. The S-D Logic leader must effectively align and integrate firm core competencies into the network requirements. For S-D Logic Varadarajan, Jayachandran, & White’s (2001) deconglomeration is all the more coherent, the efficient network more able to assemble, disassemble, and reassemble discrete value propositions capable of continuous value creation. In a subtle inversion this new logic

asserts a shift to network level transaction value analysis as oppose to a transaction cost approach. As transactions become more valuable in the network transactions will move to the network. The difficulties with contemporary price mechanisms are less burdensome (Sawhney, 2006) from a transaction value perspective. The investigation finds that the firm's leadership interacts with the network to understand signals as to what firm strategy, what firm competency, presents the network the greatest value. This is confirms similar suggestions of S-D Logic (Vargo and Lusch, 2006).

P15<sub>a</sub>: Increased service-oriented firm strategy positively influences the service oriented decision process.

P15<sub>b</sub>: Increase in the service-oriented mindset positively influence the execution of firm strategy.

#### 4.4.2.3.3 Organizational Leadership (Resource Competency)

The firm leadership determines how to effectively resource competencies to maximize the firm's long term value-proposition. The investigation supports the S-D Logic inference that in a service-oriented strategy, firm competency is evaluated against the strongest value proposition in relationship to the specific network (Day, 2006a; Vargo and Lusch, 2004a). The grounded theory investigation demonstrated that firm leadership determines how to effectively resource competencies to achieve strategic objective. The shift to a service-oriented strategy requires a reexamination of tangible (equipment, facilities, information system architecture), and intangible (knowledge and skills of the employees) with respect to the service-oriented network value proposition. Leadership actions that generate performance-oriented competencies lead to continuous value creation:

I think that you are more focused because the PBL is, it goes back to something I said earlier, the PBL is your reason for existence. If you were not good at it, you are not the customer's best value, there is no reason for you to remain.

S-D Logic conceptually articulates the links between firm competencies, value proposition, network co-creation and continuous value generation (Vargo and Lusch, 2004a). The grounded theory investigation revealed the constructs and theoretical relationships associated with these links. For Vargo & Lusch (2004a) the terms operant resources, skills and knowledge, and competence are used interchangeably (Vargo and Lusch, 2004a). The source of competitive advantage is knowledge (FP4) and knowledge is the fundamental unit of exchange (FP1), therefore firm leadership's paramount role is to resource the creation of knowledge based competencies (Vargo and Lusch, 2004a). The investigation found support for suggestion that knowledge based renewable competencies are the essence of competitive advantage (Vargo and Lusch, 2004a). All other firm assets are tertiary.

S-D Logic provides an aggregate level, macro-marketing, framework (Vargo and Lusch, 2004a; Vargo and Lusch, 2004b). This framework provides for an evaluation of service orientation from the perspective of firm, network, and societies:

S-D Logic is based on an understanding of the interwoven fabric of individuals and organizations, brought together into networks and societies, specializing in and exchanging the application of their competences for the applied competences they need for their own well being (Lusch et al., 2007, p. 6).

The constellations of networks act as part of society and give S-D Logic an economy level perspective. In this perspective firm valuation shifts from land, labor and capital to network knowledge based competencies supportive of the value propositions offered by the firm. The market values the firm as part of their constellation of network and their continuum of value offerings (Vargo and Lusch, 2004a). The investigation finds that the individual firm leadership resources these competencies; these competencies are brought together by the network to

create a value proposition (Lusch et al., 2007; Vargo and Lusch, 2004a). For Gummesson (2004, p. 20) the value of operant resources is captured as:

Therefore, the value of such operant resources is determined not by exchange but by the extent to which each resource contributes to the firm's ability to produce efficiently/effectively market offerings that some market segments perceive as having value (Gummesson, 2004, p. 20).

The investigation reveals that for the service-oriented network model the value proposition of an operant resource is relative to the particular network. The network generates transactional value as it efficiently and effectively bundles the disparate firm competencies in a manner that leads to continuous value creation. The firm leadership creates and harmonizes firm competency to create a value proposition attractive to the network. Moreover, the leadership does so in a way that ensures long-term profit profitability for the firm.

P16<sub>a</sub>: Increasing service-oriented firm competency positively influences the service oriented decision process.

P16<sub>b</sub>: Increase in the service-oriented mindset positively influences the effect of resourced competency.

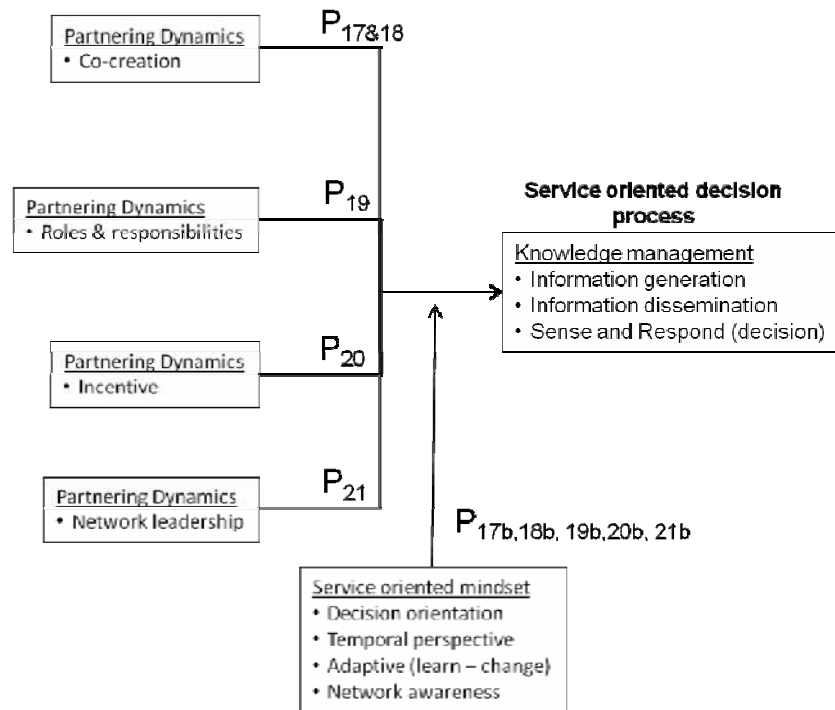
The value proposition of a service-oriented network requires a shift in leadership priorities from that of the product-oriented strategy. The service-oriented leaders must impact employees to engage decisions with a service-oriented mindset. The service-oriented leader must define strategy congruent with that of the network. The service-oriented leaders must resource competencies that generate long-term value proposition for the applicable network. Mindset, strategy, and competency are defined to sustain the firm's value proposition as a network partner.

#### 4.4.2.4 Partnering Dynamics (Co-Creation, Roles and Responsibilities, Incentive, Network Leadership)



The grounded theory investigation identified that the service-oriented network model presents a knowledge based, adaptive, and proactive approach to inter-organizational relationships. The word frequently used to capture that relationship was “partner” or a “partnership.” The analysis demonstrated the multidimensional aspects associated with this construct and led to the term partnering dynamics. The goal in a service-oriented environment is to leverage knowledge to continually improve the overall system performance; network partners represent a significant reservoir of knowledge.

Figure 21  
Partnering Dynamics Propositions



The grounded theory investigation revealed partnering dynamics as an antecedent to the service-orientated decision process. The dynamic performance (service)-oriented strategy requires a partnering approach structurally different from that of a product-oriented approach. The performance (service)-oriented approach requires re-conceptualization of alignment of

inter-organizational relationships. The goals in a product-oriented relationship are defined by contracts, clear deliverables, and prescriptively laid out roles and responsibilities. In contrast the performance (service)-oriented philosophy focuses on understanding customer sense of value, establishing a metric, and then connecting that metric to the incentive structure of the network in a dynamic fashion.

The grounded theory emerged four elements of partnering dynamics. The first element dealt with co-creation, this category applied to both network co-creation overall, and specific co-creation with the customer. The second element dealt with roles and responsibilities, the service-oriented strategy required a dynamic and adaptable structure in relation to roles and responsibilities. The third element dealt with the incentive structure. This incentive is the bedrock aligning the partnering relationships. The essence of the performance structure lay in aligning incentive with discrete ability to impact value. The last element dealt with the network leadership. Network leadership was distinct from the firm leadership. The network leaders aim their actions at the overall network strategy and influencing the environment.

#### 4.4.2.4.1 Partnering Dynamics (Co-Creation)

The investigation revealed that in the service-oriented strategy, like S-D Logic, co-creation entails broad stakeholder involvement, to include the customer, in a dyadic and interrelated role (Vargo and Lusch, 2004a). The service-oriented managers spent a great deal of time discussing co-management with respect to the customer and network.

##### Customer Co-Creation

Customer co-creation generated a number of codes and more than one hundred segments:

You obviously have to have a clear understanding of what the customer's requirements are. Then there has to be on the flip side, the customer has to understand what our goals are.

For the grounded theory investigation, and as suggested by S-D Logic, the customer is not the target of the network's activity but an integral stakeholder. This is supportive of marketing research with respect to customer responsiveness, customer orientation, and customer focus which are presented as the normative goal for modern marketing constructs (Kohli and Jaworski, 1990; Levitt, 1960; Narver and Slater, 1990; Vargo and Lusch, 2004a). Customer co-creation leads to a focus on adapting to current customer needs while anticipating future needs. The investigation confirmed that in this perspective, production is an intermediary process (Vargo and Lusch, 2004a). For S-D Logic the product, such as durable goods, is surrounded by services such as, learning to use, repair, and adapt the product to unique needs (Vargo and Lusch, 2004a). The increased revelation of this phenomena in the economy leads to an increase in the demand of real time marketing that "integrates mass customization and relationship marketing" (Vargo and Lusch, 2004a, p. 11). The literature assertion is similar to the empirical findings of the grounded theory:

The customer needs to; we have to be tied to their processes. We have to know, and use their processes.

Interviewer: By know? Do you mean that you have to be connected somehow?

Yes, and they also have to know how we operate, and how we do things. I think that is the only way were are going to be able to achieve success. If they (customers) do not understand how our business process works, or, because you see they have this goal, whatever it is, but if they don't understand how we go about things, so they sort of just drop it (requirement) on us, and we just can't react like that. Or that isn't something that we are capable of doing at this time than they have wasted effort, and wasted opportunities... you almost become, it sounds kind of motherhood and apple pie, but you almost become one team. You know.

Interviewer: Focused on that performance?

Yes.

Customer co-creation focuses active interrelationship on understanding each other's performance requirements and systems in order to improve decisions and generate superior value proposition. The grounded theory investigation found this dealt with shared authority, insight, and responsibility. This is consistent with S-D Logic literature which finds customer co-creation an essential aspect of defining the network current and potential value propositions (Jaworski and Kohli, 2006; Vargo and Lusch, 2004a). Co-management entails an adaptive and dyadic customer relationship. In comparison to a product centric approach, a performance (service) strategy involves new roles and responsibilities with respect to the customer. As shown by the grounded theory investigation the customer, in active dyad with network partners, generates increased knowledge resulting in more effective decisions and continuous value creation. For S-D Logic the customer is always a co-creator.

P17<sub>a</sub>: Increased customer co-creation positively influences the service oriented decision process.

P17<sub>b</sub>: Increase in the service oriented mindset positively influences customer co-creation.

#### Network Co-Creation

A number of the senior managers stated that a significant source of value, such as innovative, cost effective resolution to problems, better materials, and improved processes, lay with third and fourth tier suppliers. The trick in a performance-oriented strategy is focusing that expertise, away from a transactional approach, and towards a more fluid, knowledge based, value-generating continuum:

So we know a lot of these suppliers have a lot of experience on PBL. So what we have done is formed a working group. So what we have done is formed our strategic supplier working group. I have asked for volunteers, because this is not in their contracts. This also has folks from our side, the business people, the supply chain people, various other functions. That make up this group. And I bring hard problems to the table, and we as a group begin to work the problems. Because I have to have their (suppliers) input, because so much relies upon them, on this program...

That is how we keep them focused, because we always bring our problems, here is how it relates to you. Now help us to figure out what is the best way to do it. So it is not like we are dictating down to them, and it is like they're helping us. Because they have all this wealth of knowledge.

Interviewer: So it is more of a collaboration?

Most definitely a collaboration.

It makes sense that the service-oriented program would increase the level of co-management. One of the strategies that routinely emerged while observing the highly performance-oriented programs was to gain investment (knowledge and capital) from the suppliers to induce reliability improvements that result in outyear savings and increased profitability. One participant, actively involved with the supply base on a leading edge performance program, discussed how co-management represents increased network wide knowledge generation. The passage demonstrates the suggested relationship between co-management and knowledge generation:

The supplier working group happens every couple of months. That is how we keep them focused, because we always bring our problem, here is how it relates to you, now help us to figure what is the best way to do it. So it is not like we are dictating down to them, and is like they're helping us. Because they have all this wealth of knowledge.

The grounded theory investigation, like S-D Logic, revealed a knowledge enabled network framework. The service-oriented network model explicates how operant resources form the essence of competitive advantage (Vargo and Lusch, 2004a) . The idea of network wide co-

creation is also consistent with the S-D Logic literature. Network co-creation is encapsulated by the intersection of (FP6) the customer is always the co-creator, and (FP9) the role of network integration (Lusch et al., 2007; Vargo and Lusch, 2004a). Network wide generation of actionable knowledge through co-creation is efficiently achievable at the cross road of high band width, low cost computing power, and enterprise wide solutions in the S-D Logic environment (Day, 2006a). Prahalad & Ramaswamy (2000, p. 80) capture the drive to, and process of, network wide co-creation:

During the last decade, managers have extended the search for competencies even further, - they now draw on a broad network of suppliers and distributors. Over time, then, the unit of strategic analysis has moved from the single company, to a family of businesses, and finally to what people call the "extended enterprise," which consists of a central firm supported by a constellation of suppliers. But the recognition that consumers are a source of competence forces managers to cast an even wider net: competence now is a function of the collective knowledge available to the whole system - an enhanced network of traditional suppliers, manufacturers, partners, investors, and customers (Prahalad and Ramaswamy, 2000, p. 80).

The investigation found support for the S-D Logic suggestion that network partners represent core competencies (Lambert and Garcia-Dastugue, 2006). Network co-creation is cross functional and enterprise wide (Lambert and Garcia-Dastugue, 2006; Vargo and Lusch, 2004a). The investigation suggests that the measurement of network activities in S-D Logic moves beyond static relationship characteristics and critical evaluation, toward measures of support and co-creation of value (Lehmann, 2006, p. 298). The goal of enterprise wide co-creation is to increase competitive advantage through the generation and dissemination of operant resources.

P18<sub>a</sub>: Increased network co-creation positively influences the service oriented decision process.

P18<sub>b</sub>: Increase in the service-oriented mindset positively influences network co-creation.

#### 4.4.2.4.2 Partnering Dynamics (Roles and Responsibilities)

The grounded theory revealed a shift in the conceptualization of roles and responsibilities. A static product-oriented contract lays out many of the roles and responsibilities. In contrast the performance-oriented strategy required underlying flexibility to optimize decision. The flexibility requires adaptive roles and responsibilities. The performance-oriented programs anticipate that the solution to the problem today given new network knowledge may not be the optimal solution to the same problem tomorrow. This dynamism requires that optimal solution dictate the roles and responsibilities. This assignment should not be constrained by predetermined contract structure. For some individuals this shift away from defined roles, and structured responsibilities engendered a degree of angst. In contrast the performance-oriented mindset actively sought new solution sets. This finding is consistent with suggestion of S-D Logic:

Business competition used to be a lot like traditional theater: On stage, the actors had clearly defined roles, and the customers paid for their tickets, sat back, and watched passively. In business, companies, distributors, and suppliers understood and adhered to their well-defined roles in a corporate relationship. Now the scene has changed, and business competition seems more like the experimental theater of the 1960s and 1970s; everyone and anyone can be part of the action. The shift away from formal, defined roles is already occurring in business-to-business relationships. Major business discontinuities such as deregulation, globalization, technological convergence, and the rapid evolution of the Internet have blurred the roles that companies play in their dealings with other businesses (Prahalad and Ramaswamy, 2000, p. 79).

The dynamics of the performance (service)-oriented environment required adaptability in roles and responsibilities in search of continually more optimal solutions. Network optimization is not limited by contractually determined boundaries, where constrained decision

is the rule. Network optimization requires the right actor executing the right solution, at the right time:

You are going to need to switch things around and say okay, this may not be directly in the contract. But I will go do it even though it may cost me a little money, but over the long term there is benefit; you're thinking over the long term versus the short term.

The grounded theory investigation supports the S-D Logic suggestion that distinguished flexibility as a key structural antecedent to continuous value creation (Kalaiganam and Varadarajan, 2006). Roles and responsibilities in an S-D Logic shift as suggested by FP6 and the customer is no longer the target of the firms activities, but a co-creator in the network value proposition (Vargo and Lusch, 2006). Network wide partners are operant resources underscoring a new relational dynamic. The service-oriented view supports the network challenge that the market “offers clear-cut roles and parties: seller/buyer, active producer/passive consumer, and subject/object” (Deighton and Narayandas, 2004, p. 19). The investigation supports an S-D Logic reconceptualization of this view. In a service network roles are continuous, intermingled, inseparable, and simultaneous (Deighton and Narayandas, 2004). Much of this flexibility in roles and adaptation is only now possible due to enterprise wide information solutions capable of total integration of demand driven co-production (Rust and Thompson, 2006). The grounded theory emerged, and the S-D Logic literature supports, the ability to dynamically assign roles and responsibilities to the entity offering the greatest value proposition as an antecedent to the service-oriented decision process.

P19<sub>a</sub> Increased ability to generate service-oriented roles and responsibilities positively influences the service oriented decision process.

P19<sub>b</sub> Increase in the service-oriented mindset positively influences the effects of service-oriented roles and responsibilities.



#### 4.4.2.4.3 Partnering Dynamics (Incentive)

The incentive structure in a performance-oriented strategy creates a dynamic network decision process optimized to satisfy tangible value propositions. The leading edge performance-oriented networks measure real time customer sense of value. These networks then decompose that value and assign incentive to network actors based upon that decomposition. This process leads to endogenous learning through profit. This is not a simple task, the structure requires a robust integration ability to decompose and assign the incentive in an equitable fashion. The efficiency and effectiveness of integration in this process directly influences learning and subsequent value creation.

The grounded theory investigation generated a theoretical framework representative of a dynamic process in a system approach (Charmaz, 2006). It makes sense that an intensive grounded theory investigation of an enterprise wide performance-oriented supply chain management strategy would reveal a system dynamic. Supply chain management as a discipline is based in the systems approach (LeKashman and Stolle, 1965). The normative goal in supply chain management is to understanding the entire network to the degree that managers can make integrated decisions cognizant of the impact on the total costs (LeKashman and Stolle, 1965).

The grounded theory investigation revealed that feedback for the service-oriented network is profit, or cash flow. For the network actors, feedback is captured as incentive; that incentive leads to learning and continuous value creation. For the service-oriented network theory the critical task of the leading edge performance-oriented strategy is unmasking indirect exchange in a way that the integrator could evaluate and reward the impact of discrete decision

on the value potential. This was a seminal finding. This finding is coherent with the suggestions of S-D Logic (Vargo and Lusch, 2006). The research participants indicated that this task had always been theoretically possible, however only recently achievable for an entire industry segment. The multi-100 billion dollar, multi-national performance sustainment programs success demanded and achieved a practical protocol that links customer perception of value to discrete network wide decision effect.

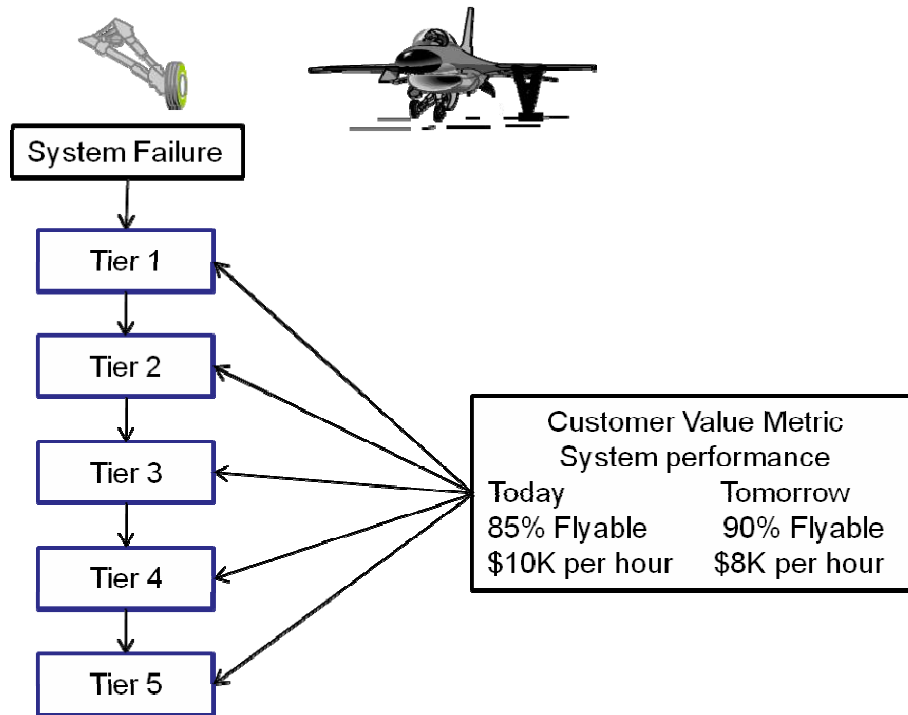
According to the participants, and as emerged in the analysis, the single greatest shift in moving from product to performance-orientation is the reconceptualization of decision worth through focused evaluation of effect and continuous value creation coupled with feedback through incentive. This empirically based finding is highly congruent with S-D Logic, and provides constructs and relationships from which to operationalize S-D Logic as an emerging network theory. The performance sustainment investigation provided an empirical, theoretical, and achievable structure that directly addresses network ability to generate surrogate price structures:

The barriers to adopting gain-sharing arrangements include the difficulty in objectively measuring the value created by solutions, resistance from purchasing organizations to using unfamiliar pricing approaches, fears of owing the solution provider a lot of money if the projects are too successful, and the lack of trust between solution providers and customers. To overcome these barriers, solution providers need to define a clear set of business success metrics for measuring value. They also need to educate the customer's organization about the benefits of gain sharing. And they need to offer to put caps that limit the maximum payout to the solution provider in the event of a runaway success (Sawhney, 2006, p. 377).

The grounded theory explicates the process and theoretical structure through which a multi-billion dollar, international, market segment overcame those barriers.

The grounded theory closes the loop on how a service oriented network uses the decomposable customer value metric to overcome the effects of micro specialization (Vargo and Lusch, 2004a). The grounded theory explicates how linking the performance metric with discrete activities brings the microspecialist back in contact with the customer and promotes learning (Vargo and Lusch, 2004a). The customer value metric rotates the tiers of the supply chain to focus the service-oriented exchange network on effect and subsequent value.

Figure 22: Rotating the Supply Chain Through a Value Metric



The focus on the value metric realigns and does away with the tiers of the supply chain. The grounded theory provides individual network “micro-specialist” a view of the entire enterprise and how their activities impact that enterprise value proposition (Vargo and Lusch, 2004a).

The grounded theory revealed a shift away from transaction cost analysis (Coase, 1937; Rindfleisch and Heide, 1997), and towards a transaction *value* analysis. The leading edge

performance-oriented networks co-create a measure of value (metric) between the network and the customer. In this process the network creates a decomposition protocol for that metric in an actionable and “price like” fashion. The grounded theory explicated the process by which a value based metric is both real time and evolutionary. While this explicated process is intuitive in theory it is difficult in practice. The process requires deep co-creation, intensive knowledge management systems, and broad access to data, along with redefinition of contract and incentive structures.

These findings are consistent with the confluence of events suggested as enabling the shift to an S-D Logic environment. These include the rise in a service-oriented mindset (Vargo and Lusch, 2004a), enterprise wide knowledge management systems (Day, 2004), and engagement in co-created solutions (Jaworski and Kohli, 2006). The investigation found support for S-D Logic’s shift away from a firm based transaction cost analysis and towards a focus on value (Lusch and Vargo, 2006b). A search of the major publications relating to S-D Logic reveals the term solution being used near 300 times, price more than 150 times, knowledge over 400 times, and value almost 2000 times.

The theoretical conception and use of a co-created decomposable value metric resolves the price concerns surrounding a network theory (Wilkie and Moore, 2006; Woodruff and Flint, 2006). The grounded theory suggested a structure that allows for an ability to generate a transaction *value* analyses. This structure requires an agreed to co-created value based metric as the outcome measure in a service-oriented network. This metric is decomposable; the overarching metric is created through sub metrics. These sub-metrics are linkable to activities of individual entities. That decomposition creates a direct link between discrete network entity

decisions and impact on the network value proposition. The network integrator, based upon agreed to network protocol, then assigns incentive to the achievement of the decomposed value based metric. The transaction value approach theoretically resolves the concern of FP2 where indirect exchange masks the fundamental unit of exchange (Vargo and Lusch, 2004a). The value of the network participant's discrete transactions is solvable in relation to the value metric.

The investigation finds the value metric is evolving. This is explained by a desired cost and performance improvement curve. This cost and performance curve is based upon trended customer value, trended competitor achievement, and trended technological advance. This strategy creation is not simple. However, as illuminated by the grounded theory investigation, the network capable of adopting such strategy unlocks the true value based learning potential of a knowledge based service-oriented strategy. Both the grounded theory and the S-D Logic literature indicates the confluence of information technology, low cost processing power, high bandwidth, customer attraction to co-creation, and shift to knowledge based sources of value, indicates the firms adopting such strategy will enjoy competitive advantage (Day, 2006a; Lusch and Vargo, 2006b).

The grounded theory investigation revealed that such a strategy has always been theoretically achievable. The participants indicated that recent enterprise wide information technology solutions provide an ability to capture the customer use (value) data, and an ability to generate network wide intelligence process that makes efficient what was previously inefficient (Lusch and Vargo, 2006b). The confluence of information systems and network

mentality of customers and network member shifting to a value based exchange, as opposed to cost-based exchange, makes such strategy now achievable:

The system metric may be influenced by sustaining engineering, by supply chain, by the information technology community, by the software community and so forth. That is where we have our decomposable metric and that is where we are trying to create increased performance. We are saying okay as you develop a subsystem metric we will allocate performance to that metric. And we will develop a model that will do that. Now that is a little more complex than this simple explanation. Now the suppliers have a decomposed part of the metric they can play with.

Network decision actions are evaluated and assigned incentive, and potential future incentive, in a direct link through the decomposition of a network agreed, evolutionary, value metric. In this way a network actor learns, through profit, which decisions increase the probability of continuous value creation. Efficiency and effectiveness of the metric with respect to true customer value directly influences learning, customer satisfaction, and continuous value creation.

P20<sub>a</sub>: Increased efficiency and effectiveness of a transaction value incentive structure positively influences the service oriented decision process.

P20<sub>b</sub>: Increase in the service-oriented mindset positively influences the execution of a transaction value incentive structure.

#### 4.4.2.4.4 Partnering Dynamics (Network Leadership)

The investigation revealed network leadership as a construct distinct from firm leadership. Network leadership establishes the governing framework, overcomes resistance to performance-orientation, and impacts the environment. Network leadership looks across the network and looks out of the network. Network leadership is distinct from the role of integration. The integrator is a key network leader however that does not restrain other entities from acting in a network leadership role. Firm leadership focused in from the network toward the firm; the goal of the firm leader to harmonize firm activities with network strategy. Network leadership stands in the network looking across the network and out of the network. The network leadership is oriented toward steering the network into the future, establishing the governing framework, and impacting the environment.

Some participants called the performance based strategy a partnership, others a collaboration, still others the supply chain. The performance-oriented network appeared to lay somewhere in between the theory of the firm and open market transactions. The performance network emerged as a collaborative, evolving, partnership, focused on a performance outcome. The network required a leadership approach oriented toward similar partner based solutions. The network requires leadership that understands the value potential in a service-oriented approach:

(Referring to senior network leader comprehension of performance-oriented strategy) That leader got PBL, that leader knew what PBL was. That leader would go to do the things that needed to be done. And we do not have that on the government side now.....we are lacking that now on the government side.

The shift inferred by the evolution to a service-oriented market place requires network leadership comprehension of the shift, and ability to positively affect inter and extra network

activities to leverage network resource to capitalize on that shift. Overcoming the inertia of the product based paradigm requires network “leadership and resource commitments sustained by a sense of urgency because of the threat of new or existing competitors that are better aligned with changing customer requirements” (Day, 2004, p. 19). The investigation found that network leadership requires shared vision, network level trust and commitment, and mutual interdependence (Flint and Mentzer, 2006). The network leader structures incentives and goals to reconceptualize products as intermediary platforms from which to provide services (Sawhney, 2006; Vargo and Lusch, 2004a).

The investigation found that the service oriented network leadership takes an active role to impact “practice, pedagogy, as well as for general management and public policy” (Bolton, 2004, p. 18). The grounded theory investigation revealed that network leaders act to impact macro variables, influencing the environment, to include public policy (Wilkie and Moore, 2006). Some of the senior industry leaders actively engage in formulating strategy to influence public policy and law so that these institutional constraints adopt a more supportive performance-oriented approach. The investigation confirmed the S-D Logic suggestion that integration (FP9) is an inherently macro-level, aggregate marketing system, construct (Vargo and Lusch, 2006):

P21<sub>a</sub>: Increased service-oriented network leadership positively influences the service oriented decision process.

P21<sub>b</sub>: Increase in the service-oriented mindset positively influences the execution of service-oriented network leadership.

#### 4.4.2.5 Information Systems (Strategy, Architecture, Access)

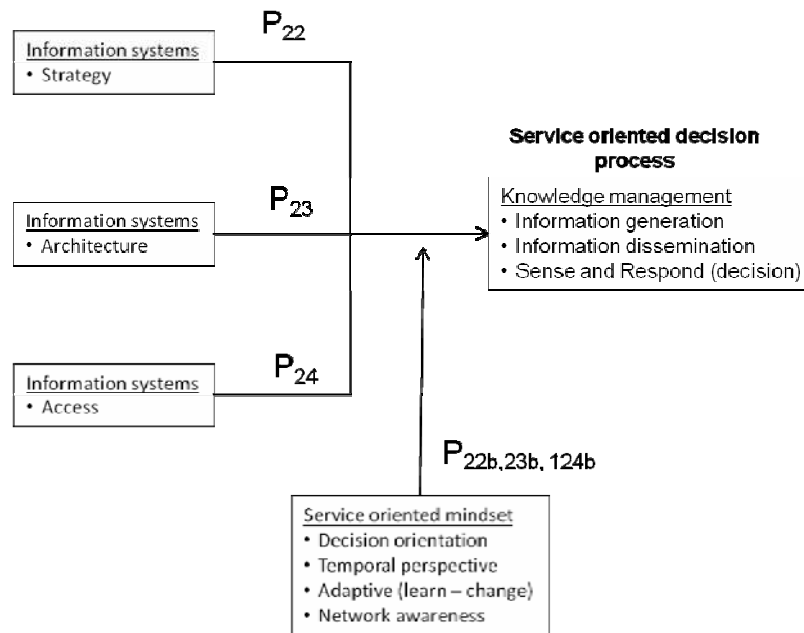
The grounded theory investigation revealed the significant role information systems play in the service-oriented decision strategy. The analysis generated a number of codes dealing



with information flow, information systems, access, software, reporting, decision support tools, data integration, intelligent agents, and other information related concepts. These codes centered on the concept of information systems. Observed meetings between customer, network partners, integrator, and suppliers, focused significant discussion on information system strategy, architecture, and access.

Reviewing programs at varying stages of performance-oriented strategy gave dimensionality to the information systems category. For instance one program maintained operations at a single location, face-to-face communication, was a significant augmentation to their information systems. While another worldwide program generated tremendous volumes of information, efficient flow and “gate keeping” information was a major focus.

Figure 23  
Information System Propositions



Establishing and decomposing value-based metrics involves enterprise wide information solutions. The category information system emerged three elements. The first element was strategy. The strategy dealt with how the software systems supported firm strategy. Strategy also dealt with cross network approach to how firm information system strategies harmonize with the network information system strategies. The second element was information system architecture. Architecture dealt with the specific information system solution and how systems interfaced. The last category was access. Access dealt with whom to release data, and what data should be released.

#### 4.4.2.5.1 Information Systems (Strategy)

Strategy deals with how to integrate current information systems, and where to take these information systems in the future. This finding is consistent with FP4's suggestion that knowledge generated, requires efficient dissemination to support decision and positively

influence continuous value creation (Vargo and Lusch, 2004a). Network strategy for knowledge enabled decision support requires a congruent information system strategy. The grounded theory explicated that as programs shift from product to service-oriented strategies, managers focus information system strategy to align legacy systems with the network goal. As programs move further into the service-oriented continuum the strategy shifts to creating enterprise wide integrated solutions that then pull information from legacy systems or to completely do away with legacy systems. The more service-oriented the leadership the more likely that leadership recognizes the requirement to invest in performance-oriented information system strategies. Properly structured, modern, information technology systems provide “increasingly synchronized, memorized and individualized marketing interactions, which, if properly managed, can result in real-time, intimate conversations between parties” (Berthon and Joby, 2006, p. 199).

The findings of the grounded theory are congruent with the S-D Logic literature. As firms become more market oriented, that is more customer focused (FP6), the firms deploy information systems capable of storing, analyzing (generating) and disseminating information about the customer, competitors, and technology (Hunt and Lambe, 2000; Vargo and Lusch, 2004a). This is congruent with the grounded theory findings that increased reliance on knowledge-based competition (FP4) requires increased generation, information dissemination, decision support systems:

In order for people to do better work they needed better decision support tools.  
People make better decisions with better decision support tools.

Service-oriented firms require an information strategy that integrates internal systems with enterprise wide solutions that provide demand driven fulfillment, sources of value, and

satisfaction (Rust and Thompson, 2006). This reliance on information systems as a core process of exchange impacts new directions for marketing to increase interaction with information system scholarship (Shugan, 2004). An S-D Logic firm strategy should:

Systematically (1) gather information on present and potential customers and competitors and (2) use such information in a coordinated way across departments to guide strategy recognition, understanding, creation, selection, implementation, and modification (Hunt and Madhavaram, 2006, p. 78).

The grounded theory confirmed the S-D Logic assertion that information strategy is an elemental antecedent to service-oriented competitive advantage. Hunt (2000) points out that information acquisition is costly and imperfect. More efficient information system strategies reduce network transaction cost and create network competitive advantage in the knowledge value conversion process.

P22<sub>a</sub>: Increased service-oriented information strategy positively influences the service oriented decision process.

P22<sub>b</sub>: Increase in the service-oriented mindset positively influences effect of a service oriented information strategy.

#### 4.4.2.5.2 Information System (Architecture)

The grounded theory investigation revealed the manner in which the conversion of information to actionable knowledge and then continuous value through decision requires congruent performance-oriented information system architecture. Throughout the interviews participants stated that most of the information required to execute a performance-oriented strategy had been available in the past. However, information system architectures did not support a cost effective conversion of that information to knowledge and that knowledge to value. The investigation found support for suggestions that one of the underlying enabling factors in the transition to the service-oriented strategy lay in the ability of information systems

to capture, sort, and make available the vast amounts of data in timely and efficient manner (Flint and Mentzer, 2006). The leading edge entities adopted an information system strategy and architecture that foresaw information as knowledge, and (FP4) knowledge as competitive advantage (Vargo and Lusch, 2004a). These entities leveraged that architecture to increase the efficiency of the knowledge to value-generating proposition.

The participants indicated that recent enterprise wide information system solutions have generated an ability to efficiently leverage a decomposable metric. This is congruent with the suggestion that S-D Logic has emerged at the cross roads of efficient enterprise wide solutions, affordable high bandwidth, and affordable computing power (Day, 2004; Day, 2006a). Advance in information system architectures provides technology capable of customized service-oriented solutions in an affordable manner (Vargo and Lusch, 2004b). Previous case study has suggests a positive relationship between information architecture and service-oriented success (Deighton and Narayandas, 2004). The grounded theory investigation demonstrate the nature of this relationship (Berthon and Joby, 2006). The grounded theory explicated how information strategy, coupled with efficient information architecture provides the service-oriented network an ability for “making better value propositions from the feedback it receives from the marketplace in terms of firm financial performance” (Vargo and Lusch, 2004a, p. 4).

P23<sub>a</sub>: Increased service-oriented information architecture positively influences the service oriented decision process.

P23<sub>b</sub>: Increase in the service oriented mindset positively influences the effect of a service-oriented information architecture.

#### 4.4.2.5.3 Information System (Access)

This research revealed how knowledge dissemination over robust and efficient service oriented architecture requires broad access for this knowledge to be actionable. The interviews revealed a great deal of government and industry concern with respect to access. The participants relayed a discernable tension in creating the correct balance between probability that greater access to data may lead to an improved decision, and the need to safeguard certain data.

One approach to knowledge leverage was to give network members insight into cross network solutions. The ability to push data, using intelligent agents and decision support tools, impacted access with respect to the overall strategy. Network decision makers might task intelligent agents to search for system trends and solutions that may provide effective solutions to similar cross network issues. For instance the agent may recognize cross network warehouse utilization solutions as a template for other solutions dealing with airport ramp space or excess transportation capacities. This type of protocol requires wide access in support of unanticipated solution. In support of S-D Logic this type of access leverages explicit knowledge; knowledge which can be digitized and circulated (Ballantyne and Varey, 2006). This finding is consistent with examples in the literature, such as the manner in which GE plastics division allows potential partners access to large online databases of proprietary information. Potential partners are able to run excursions with the data to enable them to create possible solutions. The value of the proprietary information is balanced against the potential sales, and trend data that these excursions in the database create (Kalaigianam and Varadarajan, 2006).

Access also dealt with release of proprietary information. In a service-oriented strategy, proprietary constraint represented a bit of a conundrum. Theoretically the probability of knowledge increasing positive decision effect supported release of proprietary data:

You have to have that ability, you have to have access and be able to analyze the data, and help them make the most cost-effective decision.

The grounded theory investigation revealed access to network wide knowledge as an enabler of service-oriented continuous value creation. However this requires balance with respect to certain proprietary value for individual actors. However the investigation appeared to support suggestions that there appears to be a market trend where previously monopolized information is now available in an efficient form through the internet (Prahalad and Ramaswamy, 2000). The grounded theory illuminated a trend to reconceptualize information value not as something to be protected but something to be quickly acted upon to create a value-proposition. The link between connected and accessible knowledge and value is shown "by facilitating information flows, and the concomitant knowledge sharing and utilization, the enablers will also speed acceptance of the premise that 'knowledge is the fundamental source of competitive advantage'" (Day, 2004, p. 18). The investigation revealed that information systems connect network actors and make possible co-creation (Rust and Thompson, 2006).

P24<sub>a</sub>: Increased service-oriented information access positively influences the service-oriented decision process.

P24<sub>b</sub>: Increase in the service-oriented mindset positively influences effect of a service-oriented information access.

#### 4.4.3 Consequences of the Service-Oriented Decision Process

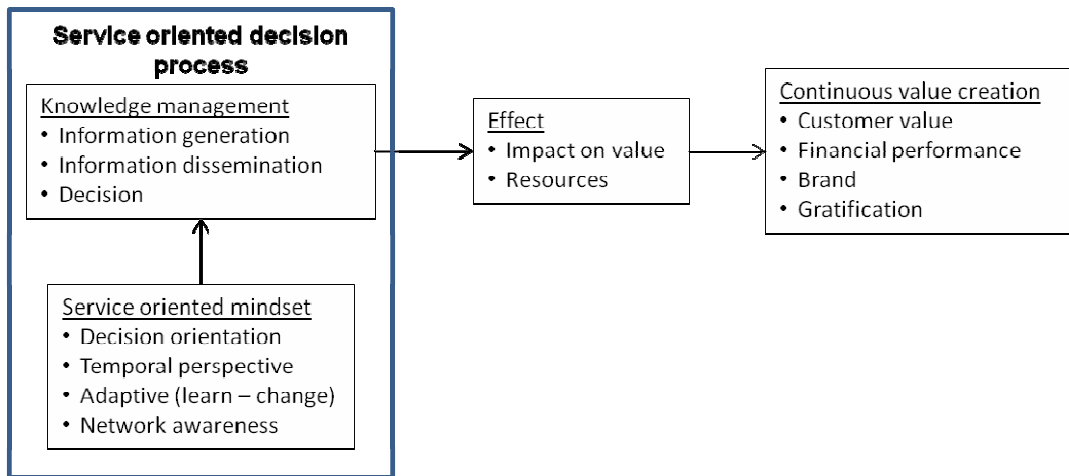
The grounded theory generated a great deal of insight into the outcome of the service-oriented decision process. The key insight is that a service-oriented strategy delineates the

effect of a decision, and the subsequent service value generated by that effect. This delineation reveals the specific process by which decision converts knowledge into effect. Effect then impacts service to generate value. This process provides the service-oriented model the ability to judge the value of the discrete knowledge based transactions. In this way the investigation revealed support for a theory of transaction value analysis. As the value of the transaction increases in the network as opposed to the firm or the market, more transactions will occur in the network.

The integrator captures this value based effect and provides feedback on how network entities' decisions impact the outcome. The service-oriented strategy, in the minds of many of the research participants, brought greater coherency to the linkage between decision, effect, and continuous value creation. The clarity and inductive coherency of the linkage increases the probability of greater generalizability of the model. The service-oriented decision process results in an effect. This effect can be measured in respect to the continuous value creation. Figure 24 outlines the relationship between the service-oriented decision process, effect, and outcome.



Figure 24  
Consequence of the Service Oriented Decision Process



The two boxes on the right side of the model present a serial approach to outcome constructs. The objective of a service-oriented strategy is to align the network to achieve improved value. This is accomplished by linking reward to discrete decision, to the effect of that decision, and to the impact on continuous value creation.

#### 4.4.3.1 Effect

The evaluation of “goodness” of the decision represents the ratio of investment against incentive. The antecedents and process of the theoretical model, as previously discussed, influence the efficiency of effect generation as a result of decision. In a service-oriented network the effect of a decision impacts the value and the resource streams of the network. The probability of continuous value creation is effectively captured in the following manner:

$$CVC = \sum_{i=1}^n VSG_i - \sum_{i=1}^n VSC_i$$

$CVC$  = continuous value creation

$\sum_{i=1}^n VSG_i$  = value of generated by the series of decisions

$$\sum_{i=1}^N VSC_i = \text{value of resources consumed by the decisions}$$

The grounded theory investigation illuminated the process of co-creating a network value metric. This value metric is the key to unlocking the endogenously created value of a service-oriented network. The network value metric is the single most significant finding that emerged in the grounded theory:

The system metric may be influenced by sustaining engineering, by supply chain, by the information technology community, by the software community and so forth. That is where we have our decomposable metric and that is where we are trying to create increased performance. We are saying okay as you develop a subsystem metric we will allocate performance to that metric. And we will develop a model that will do that. Now that is a little more complex than this simple explanation. Now the suppliers have a decomposed part of the metric they can play with.

The development of the service-oriented model and the ability to generate a decomposable value metric is essential to incentive based learning. The link between the decision and effect on value is seminal to service-oriented network continuous value creation through *learning*. For the grounded theory the ratio of this value creation to resource consumption becomes the overall measure of network value and network value potential.

The focus on resources, and the ability to measure value creation / resource efficiency is entirely congruent with resource advantage theory (Hunt, 2000). For the service-oriented networks competitive advantage is achieved by the network providing a greater value proposition at an equal or lesser cost than rivals (Hunt, 2000). This approach of effect / resource consumption addresses concern that S-D Logic might not be application in a non-profit environment (Ambler, 2006). Non-competitive markets can assess financial performance as the trended performance versus cost evolution as a ratio of network efficiency.

Operant resources, knowledge and skill, create a service or value based effect (Vargo and Lusch, 2004a). In the product-oriented approach industrial production (FP2) of indirect exchange masks the actual effect of a decision (Vargo and Lusch, 2004a). The use of effect measurement through the decomposable value metric overcomes these limitations, promotes learning, and illuminates the network's specific knowledge conversion to value through decision process. The grounded theory investigation supports the S-D Logic literature suggestion that the service-oriented strategy measures decision effect on value in a long-term and second order perspective. This perspective illuminates how the service-oriented view reconceived perspectives on financial measures (Ambler, 2006; Lehmann, 2006). For instance investment in supply chain management infrastructure, such as an enterprise resource planning system, negatively impacts short run financial performance but is likely to generate long run, nonlinear, return (Flint and Mentzer, 2006).

The investigation found that the ability of the private firm CEO to weather negative short term effects may indicate that the privately held firm is likely to more quickly adopt a long-term service-oriented strategy than their public traded counterparts (Flint and Mentzer, 2006):

Metrics have to be part of the entire equation that helps you define what your entire architecture is. It is really putting down in numbers what your customer wants performance to be... And so it provides a guideline to help develop the architecture as you go forward. So to me metrics are parameters by which you are able to set up your infrastructure, and meet the needs of what your customer is asking for.

The service-oriented network rests on a co-created value metric and the ability to decompose this metric. The impact of discrete decision is measurable with respect to the metric. The new-effect of a decision is therefore a ratio of value created through effect in comparison to

resources consumed generating that effect. The elements of effect are the resources and their effect on value. The grounded theory demonstrated that effect on value may be multi-dimensional.

P25: Increased effectiveness of service-orientation decision process positively influences continuous value creation.

P26: Increased efficiency of service-orientated decision process effects continuous value creation.

#### 4.4.3.2 Outcome

The grounded theory investigation demonstrated, four general outcomes of the performance-oriented model. These are (1) measure of customer value, (2) network actor financial performance, (3) brand, and (4) gratification. It is the first outcome, the entity ability to generate a metric representative of customer value that forms the essence of the service-oriented network theory. This section first addresses the value metric.

##### 4.4.3.2.1 Outcome (Value Metric)

The investigation revealed the manner in which the value based metric aligns and evaluates the discrete activities of a service-oriented network. The service-oriented value based metric provides for an evolutionary approach to value creation understanding. In the service-oriented network, knowledge generation, and dissemination improves the probability that the service-oriented decision process will produce effects that increase performance and value over time:

And now we get into common themes. All this rambling has some meat in there. So your business decision cycle, and you're performance incentives, and you're performance outcomes have to be aligned. So if you can align those three things, your chances of success are multiplied immensely. So your decision cycles, and what you reinforce, and what you are trying to achieve are all aligned with an output type of metric. As opposed to some of these sub metrics, the

transactional ones. Then you can optimize toward the end result that you really no kidding want.

The particular service-oriented exchange network generates a specific value metric. The underlying hypothesis is that efficient introduction of new (relevant and actionable) knowledge to an entity generating a decision (converting knowledge to effect) increases the probability that the decision will be more efficient and effective than all previous decisions (endogenous growth). This outcome is consistent with the premises of resource advantage theory (Hunt, 2000). For S-D Logic and the grounded theory price is replaced with a value proposition (Lusch and Vargo, 2006b). Each network participant evaluates the transaction value associated with network membership. In this fashion the co-created value proposition increases the potential for “a win-win situation in a field where intense negotiations have left many vendors feeling underappreciated” (Lusch et al., 2007, p. 13). The shift from transaction cost analysis to metric based transaction value analysis provides significant endogenously generated, non-zero sum gain, partnering.

P27: Increased insight into effect of service oriented decision process on customer value metric positively influences learning.

#### 4.4.3.2.2 Outcome (Financial Performance)

The second outcome variable is financial performance. Affordability represents the customer’s measure of financial performance. Some measure of profit represents the networks financial performance. For the service-oriented network affordability may represent evolutionary sharing arrangement:

Here the value in exchange (price) is tied to the value realized by the customer. Consequently, gain-sharing or risk-based pricing could be a part of developing a service strategy that links financial returns to superior service (Lusch et al., 2007, p. 13).

Affordability may address some type of risk sharing, or cost savings, or a comparison to an equivalent value-potential offered by some other network.

The financial performance of the network actors is some measure of long-term incentive. The investigation supports S-D Logic suggestion that:

Financial results not as an end result but as a test of a market hypothesis about a value proposition. The marketplace can falsify market hypotheses, which enables entities to learn about their actions and find ways to better serve their customers and to improve financial performance (Vargo and Lusch, 2004a, p. 3).

In its simplest form the overall financial performance of the network is the sum of numerous discrete decisions over the life of the program. The overall network value proposition results from decisions to generate value likely to result in financial performance. This concept can be represented mathematically:

$$\pm D = \left[ \sum_{t=1}^n (\alpha_t R_t) * (K) \right] - \sum_{t=1}^n [\beta_t C_t] - rC_n + \sum_{t=1}^q (YMP_t)$$

$\pm D$  = *implement Decision*

$R_t$  = *incentive (reward) resulting from improvement decision*

$C_t$  = *perceived opportunity cost of investment decision*

$\alpha$  = *perceived value of reward discount rate*

$\beta$  = *perceived discount rate associated with opportunity cost*

$n$  = *number of years until rebaselining occurs or market share eroding*

$rC_n$  = *residual opportunity cost at year n*

$K$  = *a dichotomous variable for the network performance goal*

$q$  = *the number of years the performance improvement provided benefit*

$MP_t$  = *the perceived yearly value of the performance improvement*

$\gamma$  = the perceived yearly discount rate associated with the improvement

The equation is modifiable to include a factor accounting for any perceived performance improvement associated with the decision. The resultant equation represents the theoretical balance of resources with respect to outcomes of the service-oriented decision process.

The overall network level financial performance can be judged by the efficiency in which the network converts knowledge into value. This conversion is rated as the effect of service-oriented decision process (knowledge management influenced by service-oriented mindset) against the value of resources consumed executing that decision. The overall model represents the efficiency of the networks ability to convert knowledge into value. For the individual firm value is generated by network membership through the positive rate associated with overall return on investment, and the potential future return on investment. For the customer the value results from continuously improving value propositions (capability and long run affordability).

The grounded theory illuminated the theoretical structure of this process. The link between value proposition and learning is achieved through the incentive structure associated with the decomposed value metric. For some network members the financial performance will be profit, for others, sales, market share, or return on investment; in general cash flow represents a critical variable with respect to capturing long run financial performance (Ambler, 2006; Vargo and Lusch, 2006).

P28: Increased insight into effect of service oriented decision process on financial performance positively influences learning.

#### 4.4.3.2.3 Outcome (Brand)

The grounded theory investigation suggests a third outcome construct for the service-oriented network. For the network actors the “brand” associated with the system, represented something of value. Interviews with research participants indicated that this “brand” acted as an incentive and aligning force. Organizations were particularly proud of being associated with performance outcome of these systems:

I am here to tell you that there is a lot of pride in the product. There is a lot of concern about selling all of our products. And firm ZZZ is a label. It is a brand and the quality is very important. I'm not preaching here. This is a true statement. The problem I have is that people, a lot of them on the customer side don't believe it. They asked why would you be that way?. And the reality is I want to see this system succeed as much as I can.

This finding of the grounded theory investigation is congruent with the S-D Logic literature. The brand represents intangible benefits that are associated with, and add to, the value proposition offered by the network (Lusch et al., 2007). The service-oriented framework challenges the product based conceptualizations of brand; this supports suggestion for experience focused researchers (Prahalad, 2004b). The service-oriented brand is aligned with the value proposition offered by the network. In the service-oriented network the value proposition becomes a measurable and dynamic measure of the co-created experience—in essence, the brand of the service-oriented output.

Remarkably the grounded theory finding is consistent with the experiential aspects of brand (Prahalad and Ramaswamy, 2004a; Prahalad and Ramaswamy, 2000), and brand experience applied to customer and network actors (Tax et al., 1998; Thorsten Hennig-Thurau, 2001). The investigation support S-D Logic suggestions dealing with off balance sheet aspects of brand assets, to include extension to network equity (Vargo and Lusch, 2006). This perspective illuminates a network brand community as similar to consumer subcultures like Harley



Davidson owners or the disgruntled clans of the Apple Newton (Arnould et al., 2006; Munez and Schau, 2005). Brand is reconceptualized for the service-oriented network. The brand becomes the network value proposition and the consumption experience associated with the value proposition.

P29: Increased insight into effect of service-orientated decision process on network brand positively influences learning.

#### 4.4.3.2.4 Outcome (Gratification)

The grounded theory investigation also generated gratification as an outcome element. Gratification acted at both the individual and the organizational level. A number of research participants identified that working in a performance environment was fundamentally more satisfying. For these entities gratification arose from being able to identify, more directly, the relationship between their activities and the performance outcome. Outcomes that clearly linked to the value creating activities of the network members appeared to be more gratifying. The analysis indicated that gratification is inherently associated with the service-oriented outcome:

Interviewer: Back to this idea of, you are talking about, folks identify with the XYZ system and its mission. Do you think that same sort of identity can occur with other less sexy systems?

The identity idea we were just talking about, it can occur with anything. It is recognizing what the customer wants. The best way to ensure the customer is happy is to be responsive to what he's asking for. That translates whether it's a jeep, a truck, a helicopter, or an airplane...it's easier to capitalize on if it's only that XYZ weapon system, but it is not going to be culturally transportable...if you if you can make the focus the customer then that translates across anything, whether it be hamburgers automobiles, or XYZ system.

For some participants the move to the service-oriented environment is both empowering and liberating. For these individuals the ability to transcend one's own "compliance mindset" and

the “compliance mindset” of others and brings immense gratification. This emerged relationship between attraction to observable outcome, and gratification, is interesting. The service-oriented strategy appeared to generate a gratification that transcended organizational boundaries. This finding suggests a rationale for the mixed results that “esprit de corps” has achieved in many of the market orientation investigations (Kirca et al., 2005; Kohli and Jaworski, 1990; Narver and Slater, 1990). The “esprit de corps” may be better conceptualized as associated with a service-oriented outcome; this may be gratification of being part of a service-oriented decision process. In a number of cases individuals stated that they found greater identity with the program, and goal achievement, than they did their organization. Gratification both influenced and was influenced by the performance-oriented mindset. Gratification appears to be engendered with a sense of pride associated with reversing the effects of (FP2) indirect exchange (Oliver, 2006; Vargo and Lusch, 2004a).

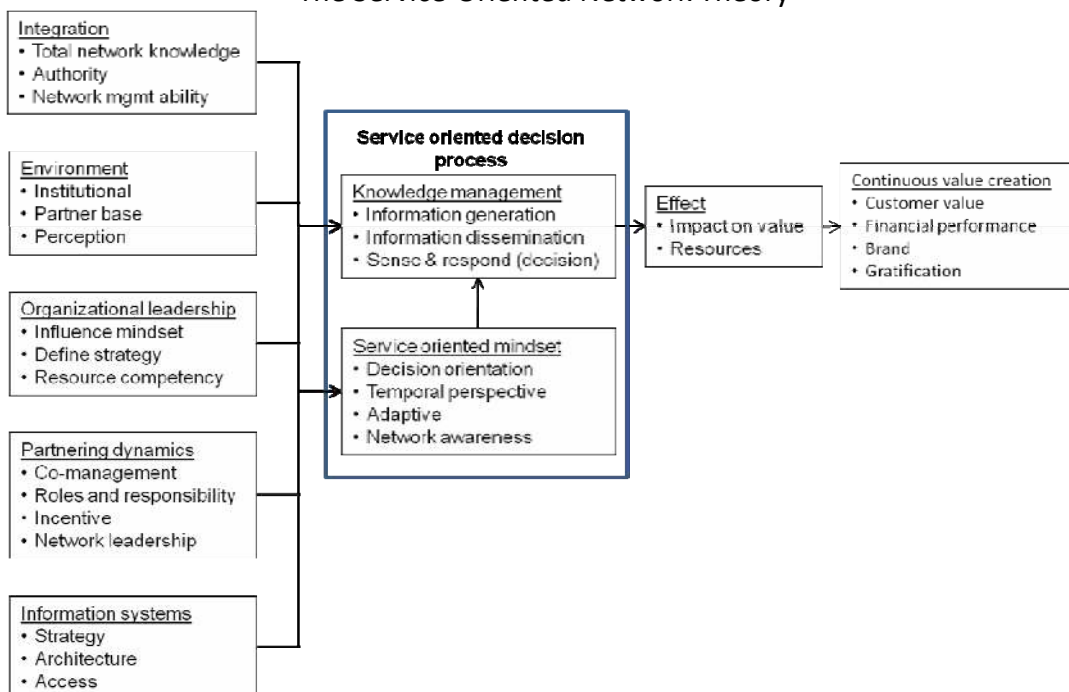
P30: Increased insight into effect of service-oriented decision process on gratification positively influences network entity gratification.

## CHAPTER 5

### SUMMARY AND CONCLUSION

This investigation generated a grounded theory of a service-oriented network. The method and analysis supports that the service-oriented network theory is suggestive of the theoretical structure of S-D Logic and provides an actionable network level theory of exchange. The theoretical structure, shown in Figure 24, provides the antecedents, core constructs, and outcomes of this network theory. This chapter begins with a brief summary of the research findings. The detailed analytic process which generated the findings is explained in section 4.2, 4.3, and 4.4. The findings are reviewed here to reorient the reader and provide a more classic 5 chapter structure to the grounded theory investigation. The chapter then presents theoretical and managerial implications. Next the chapter provides future research directions. Lastly, the chapter provides limitations, extensions, and conclusions.

Figure 25  
The Service-Oriented Network Theory



If S-D Logic provides a broad new logic for marketing, then what are its constructs, relationships, and outcomes? If such constructs, relationships, and outcomes are found what do they say about the boundaries, limitations, extensions, and *explanations* of S-D Logic? If S-D Logic is the new dominant logic, boundaries will remain elusive for good reason, there should be none. For S-D Logic to be meaningful as a marketing framework S-D Logic must find theoretical structure. This investigation provides theoretical structure that suggests a similar applicability without boundary.

### 5.1 Summary of Findings

This section provides a brief summary of the research findings. The detailed qualitative analysis is provided in sections 4.1, 4.2, 4.3 and 4.4. This section first presents the service-oriented network theory. The emerged theory serves as the key finding in this research. Section 4.1 provides the analytical detail of the inductive theory generation process. Section 4.2 and 4.4 provides the analytic detail associated with the grounded theory. Next findings dealing with the fundamental premises of S-D Logic are reviewed. Section 4.2 provides the analytical evaluation of the fundamental premises of S-D Logic. Lastly, the findings with respect to the S-D Logic debate are provided. Section 4.3 provides the analytical evaluation of the S-D Logic debate.

The study of entities making the shift from product to service oriented strategy provides a theoretical understanding of the evolving organizational structure as entities adapt to the market place environmental changes (Glaser, 1992; Holland, 1992; Vargo and Lusch, 2004a). The findings reveal a structure that appears highly consistent with the conceptual suggestions of S-D Logic; as such the resultant service-oriented network theory provides empirical support for S-D Logic.

The analysis began with an objective to provide insight into the boundaries, limitations, extensions, and insights into S-D Logic. S-D Logic is a conceptual argument; one which may provide a foundation for a new theory of marketing and lead to a new exchange framework (Lusch and Vargo, 2006b). This is a broad mandate. If S-D Logic is to fulfill such a mandate then any boundaries identified in the s-d suggested paradigmatic shift cut that mandate short. Boundaries that result in limitations or extensions would logically limit S-D Logic as an emerging paradigm. On the other hand, if there are no boundaries yet identified there can be no limitations and extensions.

There may be boundaries to S-D Logic, however this investigation into a leading edge sample rich in s-d like phenomena did not illuminate any. For now S-D Logic appears supported by the emerged service-oriented network theory. Vargo & Lusch (2006b) suggest that S-D Logic is not yet a new paradigm. They indicate that there are not enough s-d phenomena, yet, to support S-D Logic as a new paradigm. This research indicates that if the economy continues to shift in such a knowledge based, service-oriented network direction, than possibly S-D Logic will be the new paradigm. If so, then this investigation may provide insight into the structure of that new economy.

This investigation did find a broad theoretical structure of suggestive of S-D Logic. The investigation revealed that structure in the form of constructs, relationships, and outcomes. The emerged theoretical structure provided an empirical foundation from which to evaluate the fundamental premises of S-D Logic and give a tangible form to their conceptual nature. The structure reveals a very real S-D Logic market place. This is important. Like all theoretical science the generation of tangible results refocuses the nature of the investigation.

This investigation reveals the structure of an s-d network in an important segment of the market place. Arguably, as indicated in section 4.4 how this market place employs an s-d strategy is not simple, but it is doable. The organizations investigated are employing leading edge service-oriented strategies. The existence of these leading edge performance networks provides empirical support for the conceptual suggestions of S-D Logic. This has significant implication. The research solves the “if S-D Logic” and provides a theoretical model suggestive of the “how” and the “why” of S-D Logic.

#### 5.1.1 Service-Oriented Network Theory

This study generated an empirically based theoretical model depicting the structure of S-D Logic. This is an important contribution. This investigation proposes constructs, relationships and propositions of suggestive of S-D Logic structure. The investigation found that this theoretical framework is highly coherent with the S-D Logic literature. Figure 25 provides the theoretical framework that emerged from the grounded theory investigation. The detailed hypotheses are implied by the linkages between constructs as represented in Figure 25. The overall analysis and explanation of the hypotheses is presented in section 4.4. The emerged service-oriented network theory supports the suggestion that S-D Logic may form the foundation of a general theory of exchange and serve as a new dominant paradigm for marketing (Lusch and Vargo, 2006b).

The core construct of the service-oriented network theory is the service-oriented decision process. This process provides a knowledge based, dynamic, and evolutionary mechanism of value creation. This process supports the S-D Logic suggestion that the shift from product to service is fueled by a super-ordination of knowledge based skills and resources. The

investigation demonstrated the manner in which knowledge resources are co-created by network members and customers. The co-created knowledge is generated and disseminated to the “right” entity. The “right” entity senses the value of new knowledge, is inclined to respond with that new knowledge. This evolutionary process provides a value proposition today superior to the value proposition of yesterday. The service-oriented mindset influences inclination of the entity to respond in a service-oriented fashion.

The efficiency of the response is impacted by the network structure. The investigation revealed key antecedents which impact the network ability to generate superior value propositions. These antecedents influence the service-oriented decision process and are listed on the left side of Figure 25. The analysis in section 4.4 demonstrates the content of these constructs, and how these constructs relate theoretically to the service-oriented decision process.

#### 5.1.2 Fundamental Premises

Section 4.3 provides an in-depth analysis of each fundamental premise of S-D Logic. The emerged theory provided structure which illuminated the how and the why of each of the fundamental premises. The research revealed that the service-oriented network theory is entirely coherent with the conceptualization of S-D Logic as suggested by the fundamental premises. Further the structure provided by the network theory provides increased insight into the operationalized implications of the fundamental premises.

The investigation into a substantive frontier rich in s-d like phenomena returned a tangible support for the suggestions of S-D Logic. These findings support and give structure to

the fundamental premises of S-D Logic. The analysis pertaining to the fundamental premises support the suggestion that S-D Logic may form a foundation for a general theory marketing.

### 5.1.3 S-D Logic Debate

The grounded theory methodology provides an empirical platform to assess underlying structure suggested by literature (Charmaz, 2006; Glaser, 1992). Vargo & Lusch (2004a) present S-D Logic as the new dominant logic of marketing, one which subsumes the 4P's. This suggestion has generated significant debate. The emerged theory provided an empirical basis to evaluate this literature debate. Section 4.3 provides the detailed analysis of this debate. The literature debate generally reveals three camps, those supportive, those yet unconvinced, and those dismissive.

Section 4.3 uses the empirical data generated by the grounded theory to assess the three classes of the debate. The empirical analysis of S-D Logic found that in some cases Vargo and Lusch did not explicitly reveal how S-D Logic handles certain phenomena. Yet the investigation suggests this is different from saying S-D Logic as a new paradigm does not address such issues (Achrol and Kotler, 2006; Ambler, 2006; Prahalad, 2004b; Wilkie and Moore, 2006). Page count and imagination limit Vargo and Lusch's ability to provide a proactive explanation of S-D Logic versus all conceivable conditions. The investigation revealed the more intriguing question is asked not of Vargo and Lusch but of S-D Logic. Does the conceptualization of S-D Logic address the proposed limitation? In each evaluated case the investigation suggests that S-D Logic adequately addresses the asserted limitation.



## 5.2 Implications

The chapter next turns to the implications. First, the theoretical implications are presented. These implications include the co-created value metric, the theory of the network, the rise of the network, the value of institutional policy, and the service-oriented mindset. Next, the managerial implications are presented. These implications include an actionable service-oriented network model, the selection of network partners, the stage of service-orientation, and the characteristics of highly service-oriented networks.

### 5.2.1 Theoretical Implications

The grounded theory method results in theory generation (Glaser, 1992; Glaser, 1998; Glaser and Strauss, 1967b). The grounded theory method uses inductive logic to reveal the underlying theoretical structure of a substantive area (Glaser and Strauss, 1967b). The methodology goes beyond classic qualitative description by positing theoretical relationships between the operationalized constructs. The potential in this approach for this investigation is significant; S-D Logic is suggested as an emerging paradigm (Vargo and Lusch, 2006). The findings substantiate that suggestion.

The grounded theory “reemerges” many constructs whose theoretic content is consistent with the previous research yet lack position and conceptualization within the new paradigm. Scientific realism suggests that new paradigmatic views will build upon the past (Hunt, 1992). It is logical to assume that the “new” view will retain conceptual content of discrete marketing variables carried over from the past. The “new” view offers old variables positioned in a “new” theoretical framework. The new paradigm is thus recognizable but askew, slightly different but making a great deal of sense. The shifts are therefore subtle but

refreshing. Many of the “insightful” findings are self-evident; the response generated is more likely to be “of course” than “so brilliant.”

The investigation generated five significant areas of theoretical implication. The first area of implications deals with the theoretical structure of co-created value metrics. The second is an extension of this structure that reveals the nature of network based value propositions. The third area revolves around the proposed theory of the network based upon transaction value analysis. The fourth area involves the implication of a theoretical valuation of institutional factors and the service-oriented network. The last area considers the implication of service-oriented mindset as a construct.

#### 5.2.1.1 Co-Created Value Metric

The research revealed the method in which the co-created value metric aligns the service-oriented network. This has significant theoretical implication. The co-created value metric gives tangible form to the conceptualization of co-creation. As shown in section 4.4 the co-created value metric operationalizes the manner in which the network integrator decomposes the customer value metric and assigns reward to network entities. This market based “signaling” leads to dynamic learning and continuous value creation for the network.

The value metric is dynamic. The expectation is that the value proposition today will not retain the same value tomorrow. The integrator's decomposition of the metric enables the network to learn how discrete activities impact continuous value creation, and how customer's perceive that value proposition:

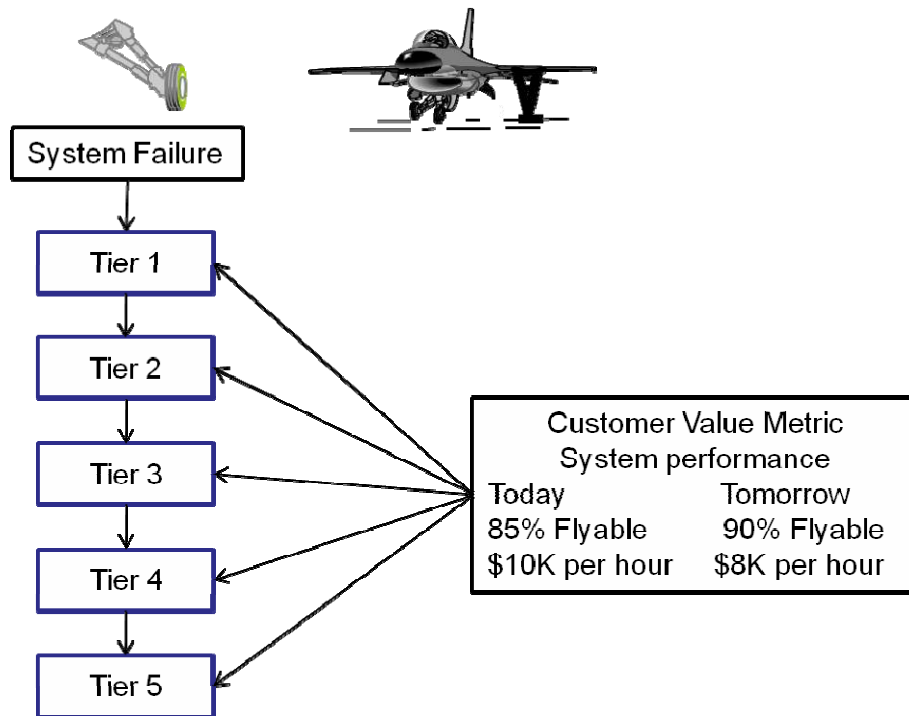
The barriers to adopting gain-sharing arrangements include the difficulty in objectively measuring the value created by solutions, resistance from purchasing organizations to using unfamiliar pricing approaches, fears of owing the solution

provider a lot of money if the projects are too successful, and the lack of trust between solution providers and customers (Sawhney, 2006, p. 377).

This co-created value metric provides a tangible goal that orients the network on customer perception of value. The investigation demonstrates how the shift to value propositions and negotiated value metrics provides an objective in measure of value while abating fears of “unaffordably” successful network partnerships.

The customer value metric brings the microspecialist back in contact with the customer and promotes learning. This finding addresses the concern of S-D Logic that monetization and indirect exchange masks the fundamental unit of exchange (Vargo and Lusch, 2004a). The customer value metric rotates the tiers of the supply chain to focus the service-oriented exchange network on evolving value propositions.

Figure 26: Rotating the Supply Chain Through a Value Metric



The focus on the value metric realigns, and does away with, the tiers of the supply chain. The metric provides the network “micro-specialist” a view of the entire enterprise and how their activities impact that enterprise value proposition. The investigation revealed the natural inclination of the customer to expect an increasing value over time. The investigation also illuminated the manner in which new knowledge is likely to support a network value proposition tomorrow that is superior to the value proposition today.

The use of a decomposable value metric captures the dynamism associated with value propositions. The shift from a product approach to the service-oriented network approach requires a corresponding shift from a static mindset to a dynamic decision orientation. The co-created value metric accepts the reality that customer perception of value is dynamic. The customer will give different worth to the value proposition tomorrow than they give to the same value proposition today. At the same time the network should leverage new knowledge to offer value propositions tomorrow that are superior to the value propositions today. The network generates learning by linking the decomposed parts of the metric back to discrete decisions.

Interviewer: okay so you're working in performance based logistics, what does the term performance logistics mean to you?

Performance is outcome, it is an outcome based set of results that meet requirements and needs of your customer. Simply outcome based production.

Interviewer: So how does that compare, in your perception, to previous strategies that are more product centered?

Product base is you are only interested in delivering to what is aligned to the contract. Whereas outcome based you are interested in more providing the service that meets a need of your customer. A value added to them.

Interviewer: Does that change the dynamics of your relationships with your customer? How?

Yes. It becomes more interactive with them, focused on what they need, and how you can help provide that need. Rather than saying this is what they contracted for, and this is what they get.

Interviewer: Ok, would it be fair to say that it is more of a dyad?

Yes it is more of a dyad in more of a relationship based, versus a strict contract based, transactional type.

The research illuminated that the value metric captures the essence of the value proposition and customer “true sense” of value. From this perspective, the value in business is not the individual firm products, but how the network’s value propositions address the service needs of the customer. The network is in business to meet customer service desire; the current product is simply one option. As time goes on that option is likely to be less satisfying; the gap between service provided by the current value proposition and the “true” service desired widening. The dynamic customer value metric focuses the network on this reality.

The service-oriented network theory suggests a customer value metric that is the agreed to representation of the customer “true” service value at that point in time. However, that metric is not the “true” value. The research revealed this as a dynamic twist on classic service quality. For the network the gap is the difference between tangible and actionable metric and “true” value. At the same time the “true” customer value is evolving. The network therefore has a dynamic opportunity to seek to close that gap. The network has some urgency in this task as the gap also represents a threat to the network. Another network may target a solution toward that gap; the increase dynamism in the value proposition increases the probability of an extra-network threat.

This research revealed the expectation that the co-created value metric is dynamic. Greater actionable knowledge suggests that tomorrow's solution should be superior to today's solution. The service network structure provides extra-network contact that may reveal technology that is transportable in a manner that offers an innovative and superior value proposition. The tiers of the supply chain present a global source for innovative solutions in support of the network value proposition.

As show in section 4.2, the investigation revealed that the classic approach to aviation logistics focused on efficiently repairing and returning parts to the operating activity in order to return aircraft to service. The classic value metric offered by the logistic network was repaired parts on hand (inventory fill levels) ready to meet maintenance requirements. However, the "true" value proposition desired by the aircraft operating activity is flyable systems. As shown in the research, the performance approach shifts from a value metric focused on ensuring adequate parts availability to a value metric focused on flyable aircraft. This is a more "true" representation of customer value. In this performance-oriented strategy the logistics agencies are rewarded for percentage of hours aircraft are flyable. Arguably one strategy to meet this requirement might be to saturate the operations activity with parts to meet maintenance requirements. However this is a sub-optimized solution. The performance networks typically emerged a more efficient strategy. The performance networks focused on rewarding entities whose parts simply did not fail. In this way the support entities are incentivized to continuously improve individual piece part performance in a manner that improves overall system performance. The customer is not interested in parts on the shelf but flyable aircraft. The dynamic customer value metric targets that value proposition.

The research revealed that the customer “true value” is logically different from the value proposition offered by network. In the example above the “true” value proposition is an aircraft capable of performance the exact mission required at the exact time required. Current management systems simply do not offer enough fidelity to support that value metric. The agreed customer value metric is the network best achievable, affordable, and actionable value proposition at that point in time. This value proposition represents the customer’s most desirable mix of performance and affordability at that point in time, this proposition is based upon the service desired not the product offered. This value proposition is likely to evolve over time.

This view is liberating for the service-oriented network. The particular co-creating network is the “most likely” network to understand the customer’s sense of value and the evolving trend associated with that value. The current co-creating network should be in a superior resource position to continue to meet that evolving value proposition.

#### 5.2.1.2 Network Value Propositions

This research provides a model of the knowledge based “production” of continuous value across a fluid service-oriented network. The structure of this model consistent with Vargo & Lusch’s (2004a) characterization of production as an intermediate step and that the network can only make value propositions. The research illuminates the manner through which the customer, the integrator, and the network of firms dynamically create continuous value. Section 4.2 and 4.4 details the method through which the decomposition of the value metric provides market based learning. The service-oriented network theory suggests how financial outcome provides the feedback on which combination of effect and resource consumption

provide long-term superior performance. This finding is consistent with Hunt & Morgan's (1996, p. 111) conceptualization of a "phylogenetic, nonconsummatory, evolutionary theory of competition". The investigation provides a network knowledge based view where knowledge based resources "are the heritable, durable units of selection, and competition among firms (networks) is the selection process that results in the survival of the locally fitter not the universally fittest" (Hunt and Morgan, 1996, p. 112).

The co-created customer value metric explains to the network the customer value proposition. Each actor evaluates the value proposition associated with network goal alignment. That value proposition (over some period of time) must be high enough for those members to stay committed and invested in the network outcome. In this manner all network members are co-creators of value. The network orientation blurs the lines between customers, integrator, and network entities.

The customer value proposition is evolutionary. At the same time the network members rationally anticipate that knowledge tomorrow will result in a superior value proposition that is not supportable based upon today's solution set. The network integrator explicitly or implicitly negotiates a value proposition with some customer. The investigation reveals how the integrator establishes dynamic benchmarks through service and cost improvement curves. The network integrator leverages learning from previous financial incentive in a quest for future superior financial incentive.

The research findings are consistent with S-D Logic suggestion that the customer is an operant resource (Lusch and Vargo, 2006b). Through the co-creating process, the customer provides insight into the nonlinear evolution of value, satisfaction, and future intention.



Satisfaction today is not a rational measure of future intention. The service-oriented network theory provides a dynamic extension to Alderson's (1957) potency concept; potency of x today is not the potency of x tomorrow. Co-creation provides the network valuable insight into an evolving sense of customer value.

The research illuminates that efficiently managing the network co-creation relationship increases the probability that the network focused on service desired, not product delivered, will have the greatest probability of satisfying and solving the evolving sense of value. The ability of the network to provide evolutionary value proposition becomes the basis for relationships between the customer and network partners. Again these findings are consistent with the suggestions of S-D Logic (Vargo and Lusch, 2004a). The network "core competency" leads to competitive advantage for network members who continue to satiate an evolutionary value proposition in a resource efficient manner.

In general, the research demonstrated that the value proposition for industry value is cash flow after accounting for previous investment and necessary future investment to anticipate and satiate future value propositions in pursuit of continuous value creation. Section 4.4 provides the detailed explanation of the relationships between these variables.

Mathematically this concept is represented as:

$$\sum_{i=1}^N Vn_i = \left( \sum_{i=1}^N R_i + \sum_{i=1}^N B_i + \sum_{i=1}^N G_i + \sum_{i=1}^N FV_i \right) - \left( \sum_{i=1}^N (U * Uc)_i + \sum_{i=1}^N I_i + \sum_{i=1}^N \beta I_i \right)$$

$$\sum_{i=1}^N Vn_i = \text{value for the network}$$

$$\sum_{i=1}^N R_i = \text{price (or savings) harvested}$$

$$\sum_{i=1}^n B_i = \text{valuated impact on brand}$$

$$\sum_{i=1}^n G_i = \text{valuated impact on gratification}$$

$$\sum_{i=1}^n Fv_i = \text{valuated impact on future value}$$

$$\sum_{i=1}^n (U + Uc)_i = \text{net unit costs}$$

$$\sum_{i=1}^n I_i = \text{some cost to repay investment}$$

$$\sum_{i=1}^n \beta I_i = \text{some cost to pay future investment}$$

$n = \text{tolerable exchange period}$

The value for the network is based upon the price harvested along with some attributable impact on brand value. The value is also impacted as shown in section 4.4 by some attributable value (gratification) that the network member associates with engaging in the service oriented process. It is also likely that the exchange process itself may actually provide learning or relationship that provides attributable impact on future value propositions outside the specific exchange. These values are discounted by the cost to produce the unit of service offering, along with some partial differential associated with paying back previous investment and necessary future investment. This value proposition is relative to some tolerable period of time ( $n$ ).

The research suggests that customer value is the evaluated value proposition for some period of time ( $m$ ). This value captures both the value of the service directly and the value associated with the consumption experience. These findings are supportive of experience-

centric literature (Prahalad and Ramaswamy, 2004a; Prahalad and Ramaswamy, 2000). Section 4.2 and 4.4 details this relationship. In general customer value is impacted by the cost (price) associated with the service and some net present value associated with the hedonic consumption experience. The net present value notionally captures all future hedonic satisfaction. This equations therefore includes “an anticipated” value based upon a retrospective evaluation of the current exchange. Value also captures some amount of resources consumed (or added) to during the exchange. The value of the service captures the direct service value and hedonic value . Mathematically these arguments can be represented as:

$$\sum_{i=1}^m Vc_i = \left( \sum_{i=1}^m Vs_i + \sum_{i=1}^m Vhg_i \right) - \left( \sum_{i=1}^m Cs_i + \sum_{i=1}^m RC_i \right)$$

$$\sum_{i=1}^m Vc_i = \text{value to customer}$$

$$\sum_{i=1}^m Vs_i = \text{value created by the service offering}$$

$$\sum_{i=1}^m Vhg_i = \text{value of hedonic gratification associate with exchange}$$

$$\sum_{i=1}^m Cs_i = \text{cost for the service}$$

$$\sum_{i=1}^m RC_i = \text{resources consumed in the exchange}$$

$$m = \text{tolerable exchange period}$$

The overall network functions to co-create when for each of the network entities (customer and partners) the summation of value over some period of time is greater than 0.

The research also indicates that the resources expended by the network in generating the current value proposition are of implicit concern to the customer. The ability of the network to generate future value propositions is impacted by the efficiency and reinvestment

opportunity that arises in the current exchange. The network resource consumption efficiency directly affects the ability and desire of the network to invest in evolutionary customer value.

This can be shown mathematically as:

$$\sum_{i=1}^m VC_i > 0 < \sum_{i=1}^n FN_i$$

The mathematical notation captures both tangible and intangible factors impacting the value proposition. For instance, if the customer realizes there is another network that provides superior value, the network value proposition immediately erodes. The equation supports notional explanation of value propositions at the micro level and the macro cross industry level.

The equation captures a trended “satisfaction” in that a temporally lower (-) value may be acceptable for a period of time (m); that is snap shots of satisfaction may be less than or greater than one. This view is enlightening and may explain why static evaluations of service provide no more than probabilistic insight into future intention (Fournier, 2002; Parasuraman et al., 1985; Sheth, 2002; Zeithaml et al., 1996). The mathematical notation captures both the customer and network value propositions. The equations are representative of the research as shown in section 4.2 and 4.4 and supportive of the knowledge enabled paradigm suggested by S-D Logic.

### 5.2.1.3 The Theory of the Network, Transaction Value Analyses

The research demonstrated the “how” and “why” a service-oriented knowledge based network generates superior value propositions. The service-oriented network relies on a co-created metric to judge the transaction value offered by network partners. Section 4.2 and 4.4 outlines the mechanism through which the co-creation metric provides employs a transaction

value approach. This focus on the value of the transaction provides a more holistic approach to understanding both value and the implication of cost. These findings are consistent with the suggestion of S-D Logic that the network value proposition is co-created and inherently relational (Vargo and Lusch, 2004a). The entities generate value propositions based upon the exchange at hand *and* the potential future value of exchanges. This research findings suggest a network level extension of Coase's (1937) theory of the firm.

Section 4.2 illustrates the mechanism by which the network integrator decomposes the metric and assigns incentive based upon how discrete transactions impact the value metric. This process explicates the manner in which an S-D Logic consistent framework "unmasks indirect exchange" (Vargo and Lusch, 2004a) and results in market based learning (Hunt, 2000). Coase (1937) states that the firm provides an effective mechanism for reducing transaction costs associated with writing and enforcing contracts, reducing uncertainty, and discovering "true" price in the market place. For Coase (1937) the entrepreneur bundles market transaction in the firm to generate efficiency and competitive advantage. This research demonstrates how the service-oriented network theory extends this to network based transactions. The integrator exists in a similar entrepreneurial fashion reducing uncertainty and discovering both true price, and more importantly, true value.

Vargo & Lusch (2006, p. 52) contend that if a "person is an expert on multivariate statistics... this person will infrequently run across people who want the direct application of his or her services." Vargo & Lusch (2006, p. 52) state that these microspecialists are "inputs the entrepreneur combines to create services that people want." The integrator for Vargo & Lusch is the entrepreneur. This research explains how the integrator efficiently employs system level

knowledge, authority, and network management ability to combine, recombine, and evolve service in pursuit of an evolving value proposition.

The research provides empirical support for Vargo & Lusch's (2006) suggestion that the integration construct of a service-oriented network may provide a foundation for an exchange theory. Section 4.2 and 4.4 of the analysis presents a theoretical operationalization of the integrator role. By garnering support for a value metric and its decomposition the integrator takes the price mechanism out of the direction of resources. The service-oriented network model shifts from a focus on cost to a concern with value provided by network level exchange activities. As the integrator acts more efficiently than the market or firm by decomposing the metric and then assigning and rewarding discrete knowledge based transactions based upon that decomposition, the network learns. The research provides the method through which this decomposition reveals learning previously obfuscated due to monetization's effect on indirect exchange (Vargo and Lusch, 2004a). The grounded theory supports Vargo & Lusch's (2004a; 2006) suggestion that the integrator may reshape classic approaches to quality management.

This explanation can be represented mathematically. The integrator functions to leverage network knowledge based resources in manner that results in more efficient value proposition creation than possible in the firm or open market. In general transactions move to the network as the network integrator generates more value versus resources consumed than either the firm or the market.

$$KC_{gr} = \frac{\alpha(\sum V_i)}{\beta(\sum R_i)}$$

*KC<sub>gr</sub> – the knowledge conversion efficiency of the decision > 1*

$\sum_{t=1}^m V_t$  = the perceived value created by the response

$\sum_{t=1}^n R_t$  = perceived resources consumed by the response

$m$  = unit of time the value is created

$n$  = unit of time resources are consumed

$\alpha$  = some coefficient of increased network efficiency through integration

$\beta$  = some coefficient of resource burden of the integration function

This process is supportive of the S-D Logic suggestion that the market has transitioned from a “product and production forces to a consumer focus and, more recently, from transaction focus to a relationship focus” (Vargo and Lusch, 2004a, p. 20). The research provides insight into how network relational structures generate continuous value creation. The integrator provides network efficiency by structuring the generation, dissemination, and conversion of knowledge to value. The reliance on a network wide knowledge pool increases the probability of a superior value proposition tomorrow.

This investigation suggests that network entities exist in a much wider spectrum of knowledge as compared to the vertically oriented firm. As the integration activities become more efficient more transactions should move to the network. Similarly more transactions will move to the network as the network generates greater actionable knowledge that positively influences the probability that solutions tomorrow will provide superior value than those today. Like Coase’s (1937) theory of the firm, the service-oriented network theory suggests the manner in which integration influences the network transaction value and predicts the conditions under which transactions are likely to shift to the network.

#### 5.2.1.4 The Rise of the Network

The research indicated that the increased efficiency of network based knowledge generation, dissemination, and response suggests an increase in service-oriented network based exchange. This finding is consistent with suggestions that S-D Logic has emerged at the confluence of a number of environmental shifts (Day, 2004). These research finds these shifts deal with a rise in connectivity, bandwidth, enterprise systems, and efficiencies of deconglomeration. Section 4.2 describes the manner in which leading edge performance logistics networks leverage knowledge based decision support systems. These findings support the suggestion that the service revolution is intractably linked with the information revolution (Rust, 2004). The research findings indicate a continued migration away from product focus and toward service-orientation. The rise of information solutions suggest an increased ability to forecast the future of service-oriented network based exchange more confidently (Day, 2004; Rust, 2004). Logically, if information technology continues to advance, the shift towards service will also intensify. As the dynamism of the customer value proposition increases the knowledge based network transactions will continue to rise. The research revealed a number of specific reasons as to why transactions are shifting to the network:

In today's world you have a lot of supply chain; it is a mindset switch with your supplier base as well. You have to incentivize them to do for you what you are essentially doing for the end user.

What I mean by that is that, prior you were in the same transactional relationship with the supplier that customer is with the focal firm. So when I go lower down the chain it's okay theirs part is breaking, so therefore I am actually, you know, having to pay more. Which I just pass on to my customer. Now what I have to do is say okay suppliers, if you can find improvements I am giving you this incentive. If you put improvements back into the system that helps our end customer, then what that does is allows us to manage that relationship so that even if I am not paying for an upgrade in performance I am still getting an



upgrade in quality of the product, and reliability etc (performance improvement). So then I can pass it on through, helped out by the long-term contract and the long-term relationship being maintained or improved as you go forward.

The network represents a significant source of knowledge from which to continually improve the disaggregate parts in a manner that synergistically evolves the whole. It makes a great deal of sense that transactions will continue to shift to the network. These findings suggest that evolving market forces are pushing and pulling the economy to a service-oriented dominant logic for exchange (Vargo and Lusch, 2004a). The research confirmed general evolution of the market environment:

1. Highly demanding, uncertain, and information intensive.
2. A focus on effect based upon information and knowledge, and less on physical benefit.
3. The generation of solutions.
4. The convergence of supply chain management and marketing theory.
5. The rise of knowledge enabled exchange.

The investigation revealed the structure through which leading edge organizations are adapting to these forces. Inductive theory generation suggests that a shift from product to service rewards the knowledge-based network exchange. The service-oriented network theory provides an initial explication of the “how, and why” of a service-oriented network. The analysis in section 4.4 also suggests which transactions are likely to shift to the network.

The service-oriented network structure improves the cooperating firms’ ability to reduce risk associated with a turbulent knowledge-based value proposition. Increased actionable knowledge positively influences the network’s ability to anticipate evolutionary value propositions. A key source of knowledge comes from the network partners:

Interviewer: Who is most capable of doing that (improve reliability or improve repair procedure?)

The vendor in my opinion. The vendor is most capable of fixing the product, they know so much.

The partner base (vendor) represents a knowledge-based resource for the network. That partnership provides complementary resources that augment core capability and lead to cost and/or differentiation advantage. The investigation supports S-D Logic's suggestion that the network creates value by drawing on the "competencies of their supply chain" (Prahalad and Ramaswamy, 2000, p. 80). As indicated in section 4.2 the leading edge service-oriented network looked for innovative solutions in their supply chain. These findings support and operationalize S-D Logic suggestions "network partners represent core competences that are organized to gain competitive advantage by performing specialized marketing functions" (Vargo and Lusch, 2004a, p. 5).

The investigation illuminated that an integrated network approach provides a mechanism for minimizing and dispersing capital risks. This dispersal increases the flexibility of the network to respond with evolutionary value propositions. The service-oriented integrator "went to the network" to generate investment for performance and cost improvement. The investigation also illuminated that the integrator would provide network entities resources in order to generate long-term value propositions:

We realized we had to help the "mom and pop" operation meet full rate production.

The ability of the network to meet an evolutionary value proposition suggests that network investment into other entities may make a great deal of financial sense. This is particularly true when those making the investment do not want the long-term "inflexibility" associated with developing the particular core competency.

The leading edge networks studied in the investigation pushed value generating transactions “back in the supply chain”. This technique reduced the costs generated from differentiation and the cost associated with place utility of tangible assets. Moving back in the supply chain generally results in a dynamic decision being made by third and fourth tier partners. This is an advantage as these partners are typically most knowledgeable about the specific piece part. Given clear linkage between their decision and the overall customer value metric these partners had better insight into how the piece part might be redesigned, or a new part leveraged, to generate a superior value proposition. The co-created value metric pulls the tiers of the supply chain closer to the customer value proposition. The decomposable customer value metric in essence “warps” the supply chain to put the third, fourth, and fifth tier supply chain members in direct contact with the customer value proposition.

The research indicated that as dynamism associated with the customer value proposition increased there is a general increased inclination to shift more toward network knowledge based exchange. Increased efficiency in network generation and dissemination of actionable knowledge positively influenced the probability that the network will provide solutions to increasingly dynamic value propositions. The service-oriented network theory rests upon co-created dynamic value propositions:

It has the supply-chain aspect. But the metric also has a design aspect of it. So if we are going to increase performance, you have to give us a reliability improvement curve. You have to have that design (as an) element of their metric, or they could just fill the supply-chain with parts.

The service-oriented network is structured to provide continuous value creation through explicit and implicit performance and cost improvement curves.

The co-created decomposable value metric decreases uncertainty associated with cross network transactions. As the uncertainty with respect to response and reward decreases the network members are more likely to make an investment which leads to continuous value creation. Service-oriented integration is constantly iterating long-term reward against investment decisions to improve the value proposition:

Most of the time with supply chain management at the very top level they will feel comfortable with a performance-oriented strategy. If you give them a long-term view, we found our network member would invest capital their ahead of the performance improvement. So it would be a better next year.

Innovative service improvements typically require some level of investment and support from the network members. The integrator takes the business case to the network either directly or indirectly through enterprise information systems. The integrator links the investment decision with the future incentive.

Section 4.2 outlines the manner in which the likelihood of investment positively relates to the tangibility of the reward. Improved links between decision and incentive increases the probability the decision will be resourced. Efficient incentive structure positively influences decision response towards continuous value creation. The decision to expend funds in search of future reward is based upon the reward resulting from that decision, the risk of that reward not occurring and the opportunity cost associated with using that investment. This process can be shown mathematically:

$$\pm D = \left[ \sum_{i=1}^n (\alpha_i R_i) * (K) \right] - \sum_{i=1}^n [(\beta_i C_i)] - rC_n + \sum_{i=1}^q (\gamma M p_i)$$

$\pm D = \text{investment Decision}$

$R_i = \text{incentive (reward) resulting from investment decision}$

$C_t$  = perceived opportunity cost of investment decision

$\alpha$  = perceived value generated by investment (the incentive) discount rate

$\beta$  = perceived opportunity cost associated with investment

$n$  = number of time periods incentive is generated

$rC_n$  = residual opportunity cost at time  $n$

$K$  = a dichotomous variable for the achievement of customer value metric

The decision to invest in some improvement results in value-creation when the potential reward for the network investor outweighs the potential cost to the network investor. The equation gives insight into the performance, investment, decision, value-creation process. The process results in endogenous learning by linking clear market signals (incentive) to discrete decision response. The network ability to learn from a dynamic network incentive structure provides a superior competitive mechanism in comparison to product-based contract.

The probability of network investment in evolving value propositions is based upon the perception of the reward increase (i.e., generates sales, distance of competitor value proposition) and the risk decrease. The equation accounts for the impact of an increase in length of the profit harvest season, the longer the season the more likely the investment. The investment incentive equation suggests that “market forces” inherently drive highest “bang for the buck” investment decisions. The equation highlights the fact that the network should look for, and is strongly rewarded by, low cost or no cost value proposition improvement. Additionally, integrator ability to impact uncertainty positively influences the discount rate associated with future reward.

Transactions will occur where the reward / cost ratio is highest. As the network generates greater value propositions more transactions will shift from the firm to the network. Increased knowledge, increased incentive alignment, and decreased network transaction cost increases the probability of network based continuous value creation. Transactions move from the firm to the network as the network generates increased current and future value potential. The research suggests that the network has an advantage in response flexibility, capital risk dispersion ability, path dependency reduction, and uncertainty reduction in the face of increasingly dynamic value proportions. The investigation indicates that the value potential of entities (stock price) can be conceptualized as the net present value of each entity as associated with their current and future network based value propositions.

#### 5.2.1.5 The Value of Institutional Policy

The research participants routinely discussed the impact of institutional policy on network value creation. The investigation found that institutional factors influence the network level value propositions. This finding is consistent with S-D Logic (Vargo and Lusch, 2004a) and resource advantage theory (Hunt, 2000). The proscriptive implication is that policy makers should evaluate the aggregate benefit of institutional constraints versus the summative decrease in network value as impacted by the constraint. This implication can be represented mathematically:

$$VLNI_i^m = VCD_i^u - VCD_i^c$$

*VLNI<sub>i</sub><sup>m</sup> – Value lost to the network due to the environmental constraint*

*VCD<sub>i</sub><sup>u</sup> = equals value created by the unconstrained decision (a multi – year contract)*

*VCD<sub>i</sub><sup>c</sup> = equals the value actually created due to constraint (multiple year contract)*

$VGSIF_i^d = \text{societal good generated by the institutional constraint}$

The service-oriented network model assumes that the decision maker is aware of network optimal decision:

$VCD_i$

However the optimal decision:

$D_i^c$

is constrained by some environmental factor (e.g., tariff, tax, or regulation). Therefore, the decision maker implements the second most optimal decision:

$VCD_i^c$

From a public policy perspective the impact of policy on the network and the aggregate macro-marketing structure is positive if the aggregate level good is greater than the cost impact of the policy. This can be represented as:

$$\sum_i^N VGSIF_i^d > \sum_i^M VLNIIF_i^c$$

That is the policy is “good” if the summation of network value lost due to the particular constraint is less than the value created for society by the institutional constraint.

#### 5.2.1.6 Service-Oriented Mindset

The research emerged service-oriented mindset as a moderating construct in the service-oriented decision process. This finding is consistent with S-D Logic literature suggestion that firm leadership will face challenge as individual entities resist the transition to a service mindset (Day, 2006b). The service-oriented mindset presents a rich and actionable research

construct. The mindset construct is composed of four elements. These elements are decision orientation, temporal perspective, adaptive ability, and network awareness:

Our resource managers are being entrepreneurial... they have this mindset they have good decision support tools.

I think the mindset is a continual emphasis; our president coined it about 15 years ago. Relentless pursuit of customer satisfaction and that means that you understand what the customer needs, and you try different fashions to provide those (evolving) needs.

Section 4.2 and 4.4 demonstrates that the ability to sense actionable knowledge and provide efficient response is the central process of a service-oriented network strategy. The link between tangible co-creation metrics and response focuses the organizations performance.

Mindset influences the entities inclination to respond in a service-oriented fashion:

Sometimes by putting a PBL construct on a program you now make support provider responsible for metrics that are tracked on their side and by their bosses; you give them a new mindset.

What I was telling my folks, it is the mindset has to change.

The investigation supports the mindset constructs as suggested by Jaworski & Kohli's (2006) description of the co-creating the voice of the customer:

In this co-creation process, the firm and the customers do the asking, listening, observing, and experimenting; that is, the firm and the customers engage in learning. The subject of study is customer needs/wants and firm needs/wants. The process results in the firm and customers knowing more about the needs/wants of the customer and the firm. Finally, after the process is complete, the firm and the customers figure out the goods and services that will be developed (or performed) by the firm and those that will be developed (or performed) by the customers. The co-creation process differs significantly from the process designed to hear the voice of the customer. In addition, it requires a very different mindset on the part of the firm and the customers, and calls for a different set of behaviors (Jaworski and Kohli, 2006, pp. 109-10).

Co-creating customer voice requires a mindset that involves a shift in how customers and the network entities approach the value creation proposition. The service-oriented mindset



optimizes decisions in a future orientation. This optimization aims for network level long-term value generation. Service-orientation drives alignment toward a co-created value proposition.

The investigation supports Jaworski & Kohli's (2006) co-creation conception and extends that conception to the network of firms. The entity in the service-oriented network adopts a decision orientation that is entrepreneurial. The goal is continuous value creation. That goal requires actor willingness to pursue a solution set tomorrow informed by new knowledge different from that today. These entities adopt an entrepreneurial decision orientation:

We are pulling information right now out of the legacy systems. We built a proprietary system where we could quickly pull the legacy system data and provide a better status to our resource managers. Our resource managers are being entrepreneurial.

Mindset influences the decision to adopt a service-oriented decision. In the shift from product to service mindset also shifts from compliance to what some called entrepreneurial. Mindset was a remarkably ubiquitous text segment throughout the analysis. Mindset is the lubricant of the knowledge conversion engine. This research supports the fact that S-D Logic anticipates an entrepreneurial mindset. S-D Logic suggests the value potential of the discrete microspecialist (those in the value chain) are combined by the entrepreneur "to create the service that people want" (Vargo and Lusch, 2006, p. 53). Hunt & and Lambe (2000) highlight the role of entrepreneurship as part of the competitive process where knowledge endogenously generates value. The research confirmed these suggestions.

The system level awareness coupled with performance-oriented incentives closes the loop through a sustainment "business cycle":

And now we get into common themes. All this rambling has some meat in there. So your business decision cycle, and you're performance incentives, and you're performance outcomes have to be aligned. So if you can align those three things,

your chances of success are multiplied immensely. So your decision cycles, and what you reinforce, and what you are trying to achieve are all aligned with an output type of metric. As opposed to some of these sub metrics, the transactional ones. Then you can optimize toward the end result that you really no kidding want.

The “business decision cycle” ties together knowledge generation, dissemination, and decision response process. The business decision cycle of performance logistics involves aligning performance incentive and performance outcome. Alignment increases the probability of success “immensely.” Network optimal occurs by aligning the decision cycles, reinforced incentive, and identifiable performance outcome.

The investigation demonstrated the requirement for a service-oriented mindset that maintains network level awareness. This awareness optimizes decisions toward the network level value proposition.

The specific construct mindset is not part of any particular fundamental premise. S-D Logic describes resistance to adopting a service orientation (Day, 2006b; Sawhney, 2006; Shugan, 2004). This resistance implies a mindset that the network leadership must overcome. The service-oriented mindset is adaptive, capable of generating new, knowledge enabled, solutions that are different from yesterday’s solutions. That mindset requires a network level perspective. In a service-oriented network mindset is:

The service-oriented mindset influences the decision outcome. The mindset governs the manner in which decision are made. The service-oriented mindset seeks entrepreneurial solutions focused on long-term value creating effects. The mindset adapts as new knowledge enables more efficient solutions. Network wide awareness of value propositions focuses the service-oriented mindset.

The service-oriented mindset of the entities influences the inclination to respond with a service-oriented response. The follow-on member checking sessions strongly supported the

operationalization of the mindset construct. The senior executives agreed that mindset is an actionable construct. They recognized that there are those who already have a service mindset. They also explained the need to generate the correct mindset to facilitate the shift to a service-oriented strategy:

We should take a cadre of people out of the organization, and train them to think like this for a year. I'm not talking about some executive class I'm talking about teaching them how to think differently. We could then bring those people back and place them strategically throughout the organization in hopes of spreading that mindset.

The mindset construct is a seminal finding with strong proscriptive implications. Those like Day (2006a) and Rust (2004) suggests that firms and individuals will resist the service-oriented shift. The investigation confirmed that suggestion and gave it form; the resistance is a mindset. The leading edge firms in the service-oriented economy recognize the implication a service-oriented mindset has on the conversion of knowledge to value.

### 5.2.2 Managerial Implications

Grounded theory method inherently provides significant managerial implication (Charmaz, 2006; Glaser, 1992; Glaser, 1978; Glaser and Strauss, 1967b). Grounded theory emerges variables and constructs meaningful to practitioners (Brown, 2005). Inductive theory generation provides relevant and actionable predictions, explanations, and interpretations of the underlying structure of the environment (Charmaz, 2006).

This research generated a number of managerial implications. First, the research provided an actionable service-oriented network model. Second, the research provided a framework for selection of network partners. Third, the research provided insight into the

stages of service-orientation. Fourth, the research provided managers general characteristics of highly service-oriented networks.

#### 5.2.2.1 An Actionable Model of the Service-Oriented Network

Figure 25 provides the theoretical constructs and relationships suggestive of S-D Logic. These constructs and relationships were emerged from direct observation of organizations shifting from product to service. As such Figure 25 provides recognizable and actionable variables and relationships through which manager can understand and affect the shift from product to service. This is important, the research and S-D Logic literature suggests that the shift in the environment to knowledge based competition will touch all areas of the market (Vargo and Lusch, 2004a).

The service-orientated network model provides firm and network leadership an ability to impact actionable antecedents of the service-oriented decision process. As discussed in section 4.2 and 4.4 the model suggests proscriptive implication for investment strategy, implication for generating the service-oriented mindset, and implication for resourcing response structure. During member checking sessions a number of leading edge service-oriented managers found that the service-oriented network model provided actionable constructs. These managers concurred that the underlying conceptual arguments of the S-D Logic premises were very similar to shifts they have experienced in the market. The managers indicated that the research revealed variables, relationships, and structure that provided insight into the service-oriented environment. These managers indicated that the model provided them an actionable “how” through which they might more efficiently effect performance outcome. The service-oriented network model provides operationalized antecedents that

facilitate the service oriented decision process. As shown in section 4.2 and 4.4 of the investigation these antecedents are largely controllable by firm and network leadership.

The research suggests that the question facing manager is not should a network become service-oriented. The question facing managers is when the network should engage in a proactive service-oriented strategy. For many of the managers the service-oriented view confirmed what they already knew and provided them actionable variables. For others the view coalesced nagging suspicions in a manner that provided form and future direction to strategy.

These findings confirm Brown's (2005) observation:

Businesses must play a role in working with academic researchers to determine practical applications...Many executives and managers outside marketing are interested in what marketing academics study, such as work that links customer metrics to business performance and work on the interface between the customer and the organization (Brown, 2005, p. 2).

The research findings generated executive support. The executives exhibited great interest in the intersection of supply chain management and marketing theory illuminated by the research, and suggested by S-D Logic. As shown in section 4.2, the research provides strong explication of the role of the network integrator. The research provides an actionable explanation of how the integrator harnesses co-created value metrics to maximize the value proposition of the network.

The analysis highlighted the manner in which environmental factors act as an antecedent of the service-oriented network performance. Section 4.2 provides an example of this interaction. The research suggests that entities might more efficiently and proactively address these factors by understanding the incommensurability of product and service-oriented

views. Industry managers recognized the requirement to modify product based policy to foster greater service-oriented win-win success.

And you have to change the culture. The behavior that you are dealing with, you know the culture, the behavior of leadership and so forth. So you have to have the right skill sets, you have to have the right type of thinking.

The analysis illuminated the role of firm leadership plays aligning firm strategy, mindset, and competency with the network's service-oriented decision process. The research suggests that managers can take simple, strategic, and in some case low cost actions to shift from a compliance to service-oriented strategy. R&D investment, capital investment, information system investment, and new hires all benefit from such a subtle shift in mindset.

As shown in section 4.2 a service-oriented view requires a reconceptualization of partnering dynamics. Service-oriented strategy requires more flexible and fluid approach to assignment of roles and responsibilities. The investigation revealed how network incentive structure alignment, that efficiently rewards the impact individual decision have on the co-created value metric, positively influences continuous value creation. This process leads to network level learning.

The investigation revealed the main elements of information systems from a service-oriented perspective. The elements are strategy, architecture, and access. Each of these elements are actionable from a managerial perspective. The service-oriented network model provides a framework for software solution providers and designers. The knowledge heavy aspects of the service-oriented require an IT core competency capable of linking decomposable metrics, decision support tools, collaborative structures, and intelligent agents.

The investigation provided insight into the outcome of the performance-oriented decision process. The key implication for managers is to ensure that the service-oriented strategy delineates the effect of a decision, and the subsequent performance value generated by that effect. This delineation reveals the specific process by which decision converts knowledge into some type of effect. Effect then impacts service generated value in a tangible and measurable manner. This process provides the network integrator the ability to judge the value of the discrete knowledge based transactions. The integrator can capture this value effect and provide feedback between decision, effect, and outcome. The service-oriented strategy brings greater coherency to the linkage between decision, effect, and continuous value creation. The service-oriented decision process results in a decision that has an effect. This effect can be measured in respect to the continuous value creation.

#### 5.2.2.2 Selection of Network Partners

The research indicates that a service-oriented approach requires partner selection based upon ability to generate continuous value creation. A number of the senior managers stated that a significant source of value lay in the third and fourth tier supplier's ability to provide innovative solution, improved materials, and improved processes. The trick in a performance-oriented strategy is focusing that expertise, away from a transactional approach, and towards a more fluid, knowledge based, value-generating continuum. Partner selection must consider how the selected partner interacts with the network to impact current and future value propositions.

The service-oriented approach generates competitive advantage by seeking to satiate an evolutionary customer value propositions. Picking partners based on a transactional "low

cost bidder” approach is incoherent with a service-oriented strategy. The service-oriented strategy suggests that a customer value proposition is inherently dynamic. The service-oriented network theory provides a dynamism to Porters (1980) competitive strategy model. Low cost strategies must continually generate “lower cost” and the differentiated must increasingly “differentiate”. The competitive strategy aims to close the gap between service delivered and “true” service desired

Current and future value-proposition potential therefore drives network partner selection. This value proposition is contingent upon the network structure. The value of a potential network partner is likely to be nonlinear due to interaction with some other network partner value proposition. Therefore there is no rationality to picking partners based upon isolated cost evaluation. The knowledge-based view demonstrates co-creation as a construct that involves all network partners. These partners are evaluated based upon their ability to influence the network value proposition. Partner selection requires a transaction value strategy. The partner selected will have a nonlinear interaction with other network partners. The selection criteria must consider impact on current network value proposition and the network’s ability to impact the evolving value proposition in the future.

#### 5.2.2.3 The Stages of Service-Orientation

The investigation revealed the stages of service-orientation. This suggests a dimensional attribute that pertains to the stage of service-orientation of any particular program. While all the organizations interviewed were aware of the shift to service not all equally engaged that shift. The investigation suggests that path dependency, organizational dynamics, environment, stage of product are all attributes that appear to moderate the stage of service-orientation.



This finding suggests that managers must recognize how these variables interplay and then adopt a strategy that generates the right amount of service-orientation for their particular network:

Interviewer: Are there stages of performance-oriented strategy?

I think there is a gradual evolution to become fully engaged in a performance logistic environment at a top level. I think what you're going to get is some areas where performance logistics, because it is such a huge transition in the risk shift, that I think there will be from a corporate perspective, and even a government perspective, dipping your feet into the water before jumping in. So you may be different things before you go into a larger full performance logistics strategy

The findings indicate a “gradual evolution” to become more service-oriented. As shown in section 4.2 CEOs and CFOs appear to be the first to recognize this shift. Further, it appears that CEOs and CFOs in privately held firms are more ready and willing to resource a shift to a service orientation than their counter parts in publically traded firms.

On an individual level there also appeared to be a natural inclination for some entities to shift. In some cases this appeared to be a predisposition to performance-oriented “decision making and risk taking”:

The approach I use when they say I have to follow the process, I say you show me where the value added is and I will follow it. Otherwise I am the program manager, I am responsible for cost schedule and performance...that is because I am a risk taker, I am a decision-maker. I don't have a problem with that, that is the way I live. That is why I am where I am. I say this is performance-based logistics the regulations just haven't caught up to it. (Regulations) haven't caught up to the concept yet.

The research indicated that positive leader action is required identifies to generate similar shift towards service-orientation in those who lack a natural service-oriented inclination. Certain individuals tend to adhere to a more static or functionally oriented strategy. One participant

called this a stove piped functional orientation where the individuals of certain “ilities” (functions) feared the shift will impact their power:

Now the challenge is that some of these cut across different “ilities” (functions). And that has been hard for people to get their mind around. Because the supply chain guys says this is all mine. The maintenance guy says this is all mine. And this is where I said no, not so fast. This is where the pushback comes. Well I own this and I will tell you how we are going to do that. And I said, I am saying that we own this from the team with the customer, and this is how we should perform.

The move to a service-oriented strategy creates a shift in the organization’s formal and informal structure.

Many of the firms achieved corporate success through development and delivery of world-class engineering products. The leadership of these firms recognized that a successful performance (service)-oriented sustainment strategy represents significant new market potential, and at the same time a significant unknown for intra-firm focused technical specialties. The investigation suggests that path dependency, organizational dynamics, environment, stage of product are all attributes that appear to moderate the stage of service-orientation. The investigation suggests that path dependency, organizational dynamics, environment, stage of product are all attributes that appear to moderate the stage of service-orientation. Managers must consider when to move to the next stage of service-orientation, and which factors must be overcome.

#### 5.2.2.4 Characteristic of the Highly Service-Oriented

The research suggested that those networks that were highly service-oriented are relatively larger, encompass more resources, and are more global. These networks appeared to be newer. They were conceptualized and constructed from the ground up to harness

knowledge based competitive advantage. This has practical implication. The research, as discussed in section 4.2, indicated that organizations resist the shift to service-orientation. The more service-oriented programs require network leaders to sense a market shift and push the network to proactively respond to the shift. The more service-oriented programs require empowered mid to senior level managers to lead the shift. These managers must be backed by leadership in this transition.

The networks at the leading edge of the service-orientation shift manifested highly dyadic network and customer co-creation. The highly service-oriented network requires a willingness to share information and strategy in search of win-win value propositions. The research indicated that many of the suppliers involved were competitors on other programs. Numerous findings revealed that the highly service-oriented network requires otherwise competitors to quickly agree to exchange information and help each other in search of network optimized value propositions.

The highly service-oriented network requires a closer relationship with the customer. Arm length negotiations are replaced by detailed collaborative work aimed at generating improved value propositions for industry and the customer. In general, the highly service oriented networks support the suggestion for collaborative structure that relies on “extensive exchange of information, products, services, finances, and risk” (Flint and Mentzer, 2006, p. 141).

### 5.3 Limitations

The investigation is not without limitations. This investigation suffers from weaknesses common to qualitative research methodology. First, the scope of the investigation is limited to

a single industry segment. Second, the scope of the investigation limited moving further back into the supply chain. Third, the research is constrained by the general limitation that the information is filtered through the individual research participants (Creswell, 2003).

The investigation focused on a single industry segment. Arguably the particular industry segment, the aerospace industry, is far reaching. The industry segment was qualified as one representing a rich source of S-D Logic phenomena. The question remains if knowledge based S-D Logic like exchange will become the dominant economic framework. And if so are the findings of this investigation supportive of broader operationalization. As described in the analysis there is good reason to believe this will be the case. If so then this research is well situated to provide broad generalizability.

This investigation looked at customer, integrator and first and second tier supplier relationships. The investigation did not examine network partners whose interaction with the specific networks represented a fraction of their economic activity. This limitation might mask a moderator to the stage of service-orientation. The investigation did not reveal if, and at what point, might commodity type transaction be appropriate.

This grounded theory analysis relies on intensive interview. Intensive interview aims to reveal underlying structure. However this revelation is filtered by the interpretation of individual participants. This is a typical concern of qualitative methods. To combat this limitation this investigation relied on theoretical sampling and theoretical saturation (see section 4.1). The use of grounded theory methodology provides a rigorous technique to guard against being overly swayed by the effective and eloquent appeals of any one research

participant. However the fact remains that the organizations represents a cultural influence on the individual perceptions of the research participants.

#### 5.4 Future Research Directions

This investigation generated a number of rich follow areas for future research. First, this research provides inductive theory generation. Inductive theory generation is well situated for follow-on deductive verification. Second this research reveals a number of initial service-oriented network mathematical models, these models are limited to first order summative explanation. The models are ripe for robust follow-on exploration. Third, this research indicates a specific co-created metric associated with the aerospace industry, further research into the structure and decomposability of more general value metrics is required.

This research sought to inductively generate theory. The investigation did not seek theory testing. There remains significant follow on quantitative work. Fortunately, a robust grounded theory investigation generates actionable data in terms of survey development, and empirical testing of the propositions. The employed grounded theory methodology generated a great deal of transcripts. These transcripts provide a rich semantic library of practitioner terms associated with the generated model. These terms, and their grouping, are well suited for survey development and follow-on theory testing. The conceptual model and inventory of research propositions provide a complementary research framework for S-D Logic investigations. The service-oriented network model provides constructs and relationships supportive of macro level quantitative investigations. Each construct and its relationships represent an area for follow-on investigation.

The investigation presented a number of conceptual math models. The empirical findings of the investigation support the math models yet they require formal follow-on explication. The mathematical explanations presented are effective as an adjunct to the written text. However, the use of summation suggests that the functions are of a first order. This is most likely not the case. The functions are logically interactive and of a second order. Follow-on research is required to explore the nature of these models. Additionally the temporal elements assumed by the models may make use of partial differentials a more effective mathematical modeling method.

The research provides an initial foray into the use of co-created metrics as an indicator of current and future value propositions. This is a rich area with tremendous potential. The research indicated that the industry segment under investigation harnessed information technology and collaborative structure to generate a decomposable value metric. Follow-on research is required to understand the influence and constraints industry segment, product class, and relational structure has upon the co-created value metric construction and its decomposition.

## 5.5 Conclusion: To Be, or Not to Be, Service-Oriented

The research provides an actionable model of service-orientation. The investigation suggests that, in theory, the decision to be service-oriented is straightforward. The more dynamic the evolution of the customer value proposition the greater the requirement for the network to harness knowledge based resources in a manner which ensures the value proposition tomorrow is superior to the value proposition today. The service-oriented model provides the firms considering creation of such networks, or evolving their current network, actionable insight into the key processes and antecedents. The critical analysis becomes the ratio of increased efficiency and effectiveness provided by network integration against the burden of that integration. Network leaders may want to consult with their supply chain management department in the shift from product to service network optimization. These professionals have long been focused on an operationalized systems approach to the market that seeks to understand network wide costs and system optimized solutions (Drucker, 1962; LeKashman and Stolle, 1965; Shaw, 1912).

At the end of the day the choice to be service oriented may be a moot point. The investigation demonstrated that segments of the market have broken the code in providing continuous creation through service oriented transaction value analysis. As the value proposition of these networks increases, as service-oriented networks generate continuous value creation, expectation of co-created continuous value creation will bleed into other markets. As information systems, computing power, and cultural norms shift more and more markets are likely to be subsumed by a service-oriented approach (Day, 2006b; Vargo and Lusch, 2004a).

This suggests an interesting speculation. The grounded theory emerged a model of S-D Logic in market driven to, and driven by, a demand for increased knowledge based cost and performance improvement curves. In this process a leading edge, global, multi-hundred billion-dollar network broke the code; they created decomposable customer value metrics. These metrics allow the network to “decompose” buckets of impact and assign them to network members. Fill your bucket and be compensated. Receive additional incentive for “overfilling your bucket.” Fail to fill your bucket and profit will not flow your way. The practitioners aligned a worldwide network focused on anticipating the customer’s evolutionary value propositions.

This remarkable achievement has occurred in the American defense aerospace industry. The investigation revealed that the lion share of free market economies are attracted to the value propositions offered by this American industry segment. The timing of this investigation is interesting. While this achievement has occurred in the American aerospace industry, it appears that the age of global domination by the American automobile industry may be over, for at least a time. For the first time a foreign firm has sold more automobile units than General Motors (Maynard, 2007). The age of American automobile production appears threatened by the “Toyota Way” (Womack and Jones, 1996). But is it?

Those aerospace networks (FP2) unmasked indirect exchange through the (FP6) co-created value metric. This metric is decomposable by the (FP9) network integrator and assigned to the network members in manner that generates learning (FP7) in order to improve the network value proposition (FP4). These networks build the finest, most advanced, aerospace products in the world, yet (FP3) these products are merely a distribution vehicle for continuously improved value propositions (FP5), that is increasing mission capability and with



concurrent reductions in cost generated by a network wide relational dyad (FP8). This has occurred through a shift to a value proposition (FP1) where knowledge and skill is the fundamental unit of exchange.

The industry examined in the grounded theory is highly representative of an S-D Logic market place. One wonders, what might happen if these highly effective and efficient co-creating aerospace networks decided to focus on other value propositions; for instance automobiles. What an amazing and exciting value proposition; imagine the discontinuous knowledge and skill infusion.

This investigation provides an important set of research findings. The literature dealing with S-D Logic highlights the controversy and the conceptual nature of S-D Logic (Webster, 2006). This investigation provides a robust empirical method for inquiry into the boundaries, limitations, and extensions of S-D Logic (Deighton and Narayandas, 2004). The method provides an actionable link between S-D Logic as a foundation for a general theory of marketing (Lusch & Vargo 2006), and initial model suggestive of such theory. For the practitioners shifting to a service-oriented strategy the service-oriented network model provides actionable processes, antecedents, and outcomes. With these constructs defined inter-firm leadership can more effectively and efficiently tailor the specific service-oriented strategies to support desired network value propositions.

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