12-2012

A Meta-model of Alignment

Jenny Leonard
University of Sydney, jenny.leonard@sydney.edu.au

Peter Seddon
University of Melbourne, Australia

Follow this and additional works at: https://aisel.aisnet.org/cais

A Meta-model of Alignment

Jenny Leonard

Business School, University of Sydney, Australia

Jenny.leonard@sydney.edu.au

Peter Seddon

Department of Computing and Information Systems, University of Melbourne, Australia

Abstract:

The literature on IS alignment is extensive, has developed significantly in the last twenty-five years, and is itself based on fifteen years of prior work exploring the strategic possibilities of information systems. Several important models have now been developed, but it is not always clear how they relate to each other. This can be problematic for practitioners, as it is not clear how, and indeed when, alignment can benefit an organization. It can be problematic for academics, in that gaps and areas for further research cannot be systematically identified. Furthermore, most alignment studies are motivated by two considerations that have themselves changed over time. First, IS alignment can bring strategic benefits to an organization, and second, alignment is consistently ranked highly as a key issue for IS managers. Over twenty-five years, there have been several key developments in strategic theory, and the issues being addressed by IS managers have changed significantly. This article addresses both problems by providing a meta-model of alignment studies, based on their relationship to different strategic theories. It populates the meta-model with examples of previous studies and demonstrates how it can be used by practitioners and academics.

Keywords: alignment, IT strategy

A Meta-model of Alignment

I. INTRODUCTION

The IS/IT strategic alignment literature is extremely extensive. An annotated bibliography by Chan and Reich [2007] identified 150 papers produced over a period of more than twenty-five years. Clearly, then, the topic is regarded as important in the information systems research community. Early papers on alignment drew on previous work on strategic IS planning [McLean and Soden, 1977; King, 1978; Earl, 1993] and the use of IT for competitive advantage [McFarlan, 1984; Galliers, 1991a] and were motivated by the desire to capture the strategic potential of information systems [Broadbent and Weill, 1993; Henderson and Venkatraman, 1993]. These were followed by a series of papers demonstrating strategic benefits (see, for example, Chan, Huff, Barclay and Copeland, 1997 and Kearns and Lederer, 2000). These demonstrated benefits became the motivators for a large number of further studies, such as Sabherwal, Hirschhiem, and Goles, 2001; Peppard and Breu, 2003; and Benbya and McKelvey, 2006. In parallel, several surveys of IS managers indicated that alignment is a key issue for them (e.g., Dickson and Nechis, 1984; Brancheau, Janz, and Wetherbe, 1996; Luftman and Ben-Zvi, 2011). This provided a second motivator for alignment studies, quoted, for example, by Luftman [2000], Reich and Benbasat [2000], Chan [2002], Weiss, Thorogood, and Clark [2006], Preston and Karahanna [2009], and Tallon and Pinsonneault [2011].

The two motivators for alignment studies: that alignment brings strategic benefits and that it is a key issue for IS managers, have been consistently quoted throughout the literature. Two key early models defined strategic and structural alignment [Henderson and Venkatraman, 1993] and explored organizational policies and practices contributing to alignment [Broadbent and Weill, 1993] respectively. Concepts which have subsequently been explored include social alignment [Reich and Benbasat, 2000], alignment maturity [Luftman, 2000], alignment and the dynamics of the environment [Sabherwal et al., 2001; Peppard and Breu, 2003; Benbya and McKelvey, 2006], contingency models of alignment [Bergeron, Raymond, and Rivard, 2004; Chan, Sabherwal, and Thatcher, 2006; Tallon, 2007–8], and the relationship of alignment with organizational agility and dynamic capabilities [Schwarz, Kalika, Kefi, and Schwarz, 2010; Tallon and Pinsonneault, 2011].

There are two concerns regarding alignment studies that are addressed in this article. The first concern is that as the literature continues to grow and develop and to define alignment in many, varied ways, it becomes increasingly difficult to identify systematically how different studies contribute to our understanding and how alignment can be used by practitioners.

The second concern is that the two quoted motivators for alignment studies have themselves changed significantly over the course of the development of the literature. There are several distinct theories of strategy, including industry positioning [Porter, 1980, 1985, 1998; Treacy and Wiersema, 1995], the Resource Based View of the firm [Barney, 1991; Grant, 1991; Mata, Fuerst, and Barney, 1995], and the Dynamic Capabilities View of strategy [Brown and Eisenhardt, 1998; Eisenhardt and Martin, 2000; Zahra, Sapienza, and Davidsson, 2006]. Practitioner definitions of alignment have also changed significantly: in the 1980s and 1990s they were based on the position of the IS department within the organization [Dickson and Nechis, 1984; Brancheau Janz and Wetherbe., 1996], a definition in line with the Resource Based View of strategy. More recently they have been based on ensuring IT harmonizes with the strategies, goals, and needs of a business [Luftman, 2005; Luftman and Kempaiah, 2008; Luftman and Ben-Zvi, 2011], reflecting a broader range of possible strategic theories.

The contribution of this article is to demonstrate that the two concerns are linked and to provide a meta-model of alignment in the context of different strategic theories. The research questions addressed are, therefore, as follows:

How have alignment models developed over the past forty years?

How do these models relate to different strategic theories?

The article proceeds as follows. An overview of key alignment models and approaches is given, including a review of the earlier works that informed the alignment paradigm. Comparisons are made regarding approaches and definitions, and the problems for practitioners and academics arising from divergence in definitions and models are discussed. This is followed by a section describing the three theories of strategy. Key alignment models are then mapped to the three theories and used to identify the qualities of, and definitions for, three types of alignment. A meta-model is then produced, using these definitions. A discussion section covers findings that emerge from this meta-model, including gaps in studies and areas for further research. The article concludes by evaluating how the meta-model might further our understanding of alignment.

II. AN OVERVIEW OF KEY ALIGNMENT MODELS AND THEIR PRECURSORS

This section reviews the literature which first recognized the strategic potential of IT and hence formed a precursor to the study of alignment. It then reviews key alignment papers, concentrating on a subset of those identified in two reviews [Chan and Reich, 2007a; Teo, 2009], namely, those which represent a specific development in alignment theory or a test of some aspect of that theory. In addition to that subset, other papers have been identified in a new area—that of alignment and complexity theory. Key papers published since the two reviews have also been included. In addition, and in keeping with Chan and Reich's comments on the relationship between practitioner and academic views on alignment [2007a, p. 300], the definitions used by practitioners have been reviewed.

The approach, then, to selecting papers is based on the knowledge that the previous reviews have successfully "reconstructed the giant" [vom Brocke, Simons, Niehaves, Riemer, Plattfaut and Cleven, 2009] of alignment literature, using an exhaustive process to identify the most important papers [Webster and Watson, 2002; vom Brocke Simons, Niehaves, Riemer, Plattfaut and Cleven, 2009]. Table 1 summarizes the papers that have been reviewed.

Precursors to Alignment Models

The need to view IT as a strategic resource was first recognized in the early 1970s. McFarlan [1971] demonstrated that companies who formally plan their "computer based information system (CBIS)" have a more effective CBIS. Nolan [1973] proposed a "stages of growth" model as being the most appropriate way to theorize within this newly developing field. McLean and Soden [1977] provided a planning framework based on a review of management information services planning in several organizations. King [1978], one of the first to argue that planning for the information systems should be "closely related to the overall strategic planning processes," proposed a model of MIS strategic planning which could achieve this and noted difficulties arising from the lack of involvement of IS staff in strategic planning. Rockart [1979] produced one of the first papers to deal with the issue of prioritizing IS development using Critical Success Factors.

By the 1980s, the IS environment had changed, and a series of papers on Strategic Information Systems Planning (SISP) explored this issue. No longer was the IS environment characterized by "a massive computer room … substantial numbers of programmers and analysts … and the first large-scale systems development projects" [Sullivan, 1985]. Minicomputers and end-user computing meant that the way in which IS was structured within the organization and how that structure developed became important. Two key papers addressing this issue were those by Sullivan [1985], who took a contingency approach, and Henderson and Treacy [1986], who described the management issues involved as end-user computing developed throughout the organization. Henderson, Rockart, and Sifonis [1987] extended Rockart's notion of critical success factors to a more diverse set of information systems. Galliers [1991a] extended the notion of stages of growth and produced a model with the elements of strategy, structure, systems, staff, style, skills, and superordinate goals (i.e., culture or shared values). He stressed the importance of taking a sociotechnical perspective.

Earl [1993] defined five different SISP approaches: business-led, method-driven, administrative, technological and organizational approach. He demonstrated that the organizational approach, which was "based on IS decisions being made through continuous integration between the IS function and the organization" was superior (p. 10).

The Strategic Information Systems Planning stream of literature, therefore, introduced notions of:

- Aligning business and IS plans

- Considering the organizational structure, both in contingent and development terms

- Conceptualizing IS planning as a continuous, integrated process within the organization.

- The development of IS resources, via stages of growth, as part of a complex bundle which was linked with organizational resources to form a sociotechnical environment

The Strategic Information Systems Planning literature focused on an organization's internal processes. By the 1980s, another stream of literature was emerging, heavily influenced by the work of Porter [1979, 1980, 1985]. This stream focused on IT for competitive advantage (ITCA).

Parsons [1983] discussed the three-level impact of IT, at industry level, firm level, and at the level of strategy within the firm. McFarlan [1984] analyzed and gave examples of how different IS might provide competitive advantage. He then defined the position of information systems as either factory, support, strategic, or turnaround, based on the strategic impact of existing operating systems and of the application development portfolio. He provided a

Table 1: Alignment and Precursor Papers Reviewed		
Authors	Nature of study	Contribution of study
McFarlan [1971]	Strategic IS Planning (SISP)	Effectiveness of IS planning
Nolan [1973]		Stages of growth model
McLean and Soden [1977]		IS planning mechanisms within the organization
King [1978]		
Rockart [1979]		Using critical success factors in information systems planning
Henderson et al. [1987]		
Sullivan [1985]	IS and the organization structure	Managing the infusion and diffusion of IS throughout the organization as of end-user computing grew in importance
Henderson and Treacy [1986]		
Earl [1993]		Integration between IS and the organization
Parsons [1983]	IT for competitive advantage	The role of IT in ensuring organizations can compete within the market in which they operate
McFarlan [1981, 1984]		
Ives and Learmonth [1984]		
Galliers [1987]	A socio-technical approach	A sociotechnical approach and a development of stages of growth models
Galliers [1991a]		
Galliers and Sutherland [1991a]		
Scott Morton [1991]	Influences on objectives	Model of five forces influencing the organization's objectives
Dickson and Nechis [1984]	Structural alignment	Delphi study of IS managers' key issues defined alignment in terms of the position of the IS function within the organization.
Brancheau and Wetherbe [1987]		
Niederman and Brancheau [1991]		
Chan [1992]	Strategic alignment	Relationship between business and IS strategy
Miller [1992]	Business alignment with environment	How business strategy aligns with the environment. Not specifically about IS
Henderson and Venkatraman [1993]	Alignment of strategic and structural domains	Four domain model of business and IS strategy and structure: alignment is a multidirectional process
Broadbent and Weill [1993]	Alignment and organizational practices	Grounded study of banking industry, identifying practices which led to information-based comparative advantages (IBCA)
Brancheau et al. [1996]	Structural alignment	Replication of earlier Delphi studies of key issues for IS managers
Chan et al. [1997]	Strategic alignment	Relationship between business and IS strategy, based on typologies
Teo and King [1996]	Strategic IS Planning and evolution	Relationship between stages of growth/ evolution of IS planning and its integration with business planning
King and Teo [1997]		
Teo and King [1997]		
Teo and King [1999]		
Reich and Benbasat [2000]	Social aspects of alignment	The social dimension of alignment
Luftman [2000]	Alignment maturity	Modeling alignment maturity in organizations
Kearns and Lederer [2000]	Alignment of business–IS plans and resources	The effect of strategic alignment on the use of IS-based resources for competitive advantage
Burns and Szeto [2000]	Perspectives on Alignment	Differences in the perceptions of IT and business managers regarding alignment
Palmer and Markus [2000]	Alignment not always proven	Examined quick response systems in specialty retailing, and did not identify benefits from alignment
Tallon, Kraemer, and Gurbaxani [2000]	Focused goals and alignment	Executives in firms with more focused goals perceived higher levels of alignment.
Sabherwal and Chan [2001]	Strategic alignment	Relationship between business and IS strategy, based on typologies

Table 1: Alignment and Precursor Papers Reviewed – Continued		
Sabherwal et al. [2001]	Alignment and changing environments	Alignment models and the way in which they change in an environment characterized as a punctuated equilibrium
Chan [2002]	Informal structural alignment	Informal preconditions are required for strategic and structural alignment.
De Leede, Looise, and Alders [2002]	Alignment between innovation and operations	Exploring the management of alignment between innovation and operations Does not specifically mention IS
Irani [2002]	Vendor-organization alignment	Alignment of a business's plans with that of IS vendor organizations
Kearns and Lederer [2003]	Shared knowledge and alignment	Knowledge sharing between IS and business executives provides strategic benefits.
Peppard and Breu [2003]	Coevolving alignment with environment	Using coevolutionary theory to model alignment within the business and with the environment
Avison, Jones, Powell, and Wilson [2004]	Using alignment	Validating alignment and providing a practical framework for its use
Bergeron et al. [2004]	Gestalt view of strategic and structural alignment	Ideal patterns of strategic alignment and business performance
Luftman and McLean [2004] Luftman [2005] Luftman [2006]	Alignment as "harmony with business strategies, goals and needs"	Key issue of IT executives The alignment definition was provided by the author based on experience and was rated highly as a key issue.
Benbya and McKelvey [2006]	Multilevel coevolutionary and complexity based alignment	Using coevolutionary and complexity theories to improve IS alignment: a multilevel approach
Byrd, Lewis, and Bryan [2006]	Alignment in planning	Resources required in coordination of IS and business plans
Chan et al. [2006]	Alignment contingency	Alignment contingent on industry type and business strategic orientation
Weiss et al. [2006]	Alignment contingency	Alignment profiles that "define the purpose and nature of IT"
Luftman and Kempaiah [2007]	Alignment and structure	Empirical evidence that alignment levels are increasing, and that organizational structure affects alignment
Tallon [2007–8]	Alignment contingency	Alignment contingent on value disciplines and processes
Preston and Karahanna [2009]	Alignment of vision	Shared vision between and organization's CIO and top management team is key to achieving alignment
Luftman and Kempaiah [2008] Luftman and Ben-Zvi [2011]	Alignment as "harmony with business strategies, goals and needs"	Replications of Key Issue surveys 2004–2006, again finding that alignment is highly rated as a key issue
Schwarz [2010]	Alignment and dynamic capabilities	Understanding alignment using the Dynamic Capabilities perspective
Sen and Sinha [2011]	Alignment of strategy with infrastructure	The alignment of strategy with infrastructure in a CRM environment
Tallon and Pinsonneault [2011]	Alignment and organizational agility	The relationship between alignment and organizational agility

contingency approach to resource allocation priorities, based on whether the industry is growing, relatively stable, or declining (p. 102). Ives and Learmonth [1984] extended the use of the five-forces model to the customer resource lifecycle model. Galliers [1991a], mentioned earlier in terms of his stages of growth model, also gave specific

examples of competitive advantage through IT. He demonstrated the speed with which competitive forces analysis was being introduced into planning processes by comparing results from his own survey work [Galliers, 1987] and that of a similar survey two years later [Wilson 1989]. Scott-Morton's model of the Five Forces Influencing the Organization's Objectives [1991] used a different set of five forces to describe the way in which management processes were influenced by the external sociotechnical and technological environment, namely strategy, structure, technology, individuals and roles, and management processes

The literature on IT for Competitive Advantage, then, considered:

- Different types of information systems portfolios, which would be suitable in different industrial environments
- Specific links between key information systems and the strategic position of the firm

Early Alignment Definitions and Models (1980s to Mid-1990s)

An early use of the term *alignment* appeared in a series of surveys of IS managers produced by the Society for Information Management. These were published between 1982 and 1996 in *MIS Quarterly* [Ball and Harris, 1982; Brancheau and Wetherbe, 1987; Niederman and Brancheau, 1991; Brancheau et al., 1996]. The 1984 survey was critical, in that it used a Delphi approach to ask managers to identify their key issues and produced a definition of alignment that was used in all subsequent surveys during this period, namely: "aligning the IS organization with that of the enterprise," a definition expanded in the later surveys as "the effectiveness with which the IS organization can support the enterprise information needs is affected by organization structure." This early definition, then, was based on organizational structure—was the IS team in the right place to fulfill the organization's IS needs? As such, it reflected elements of the SISP literature.

Henderson and Venkatraman [1993] developed a model of IS/IT alignment drawing heavily on the Scott-Morton model discussed earlier [Scott-Morton, 1991; Chan and Reich, 2007a]. They published various versions of their model, the most widely cited being a 1993 paper [Henderson and Venktraman, 1993]. This model consisted of four domains to be aligned, namely, business strategy, IT strategy, organizational infrastructure and processes, and information technology architecture and processes. As explained by Chan and Reich [2007a], it proved to be of seminal importance. Indeed, it was reprinted in 1999 to reflect that importance. Each domain was subdivided into three sub-domains: scope, competencies and governance in the case of the strategy domains, and infrastructure/architecture, processes and skills in the case of the infrastructure and processes domains.

At the same time, and, indeed, published in the same journal, another alignment model was developed, based on a study of the Australian banking industry [Broadbent and Weill, 1993]. This study took a different approach. Henderson and Venkatraman's model focused on the domains to be aligned as an implied strategic goal and provided multidirectional arrows to define alignment processes. By contrast, for Broadbent and Weill, the goal was "strategy enabling information based comparative advantages (IBCA)" (p. 164), and their model described the "organizational practices" (p. 162) which would contribute to and enhance this alignment. Such practices included "Experience of firm-wide strategic planning. Planning focused on critical and long term issues, accountabilities suitable to strategic orientation, IT to suit generation of required information and services" and "development of business skills in IS managers." These concepts are not found in Henderson and Venkatraman's [1993] paper, but reflect many of the concepts developed in the work on Strategic Information Systems Planning.

An edited book on the subject [Luftman, 1996] stated that there was little evidence in these early years of the benefit of alignment. An exception to this was Chan's Ph.D. thesis that found relationships between business and IS strategy which, "although not strong, were found to be statistically significant" [Chan, 1992, p. iii]. Other empirical studies cited in the alignment literature were either related mainly to strategic IS planning, without direct mention of alignment [Earl, 1993], or were studies of alignment of business sectors other than IS [Miller, 1992; Delery and Doty, 1996].

Even at this early stage, then, there was divergence in definitions of alignment. Each of the following definitions was used:

- Alignment of the position of the IS function within the organizational structure: the definition used by the Society of Information Managers
- Alignment between business and IS strategy showing benefits [Chan, 1992]
- Alignment between IS and business strategy and structure [Henderson and Venkatraman, 1993]
- The organizational practices that enhance Information Based Comparative Advantages (IBCA) [Broadbent and Weill, 1993]

One of the key contributions of alignment at this stage was that it was multidirectional: IS informed the business as well as business informing IS. This reflected the motivator of these early models, namely, to ensure that the strategic benefits of IS were being realized.

Development of Alignment Literature (Mid-1990s Onward)

Several key alignment concepts have been developed which have augmented the earlier models, but, again, added to the divergence in definitions. A model of alignment maturity [Luftman, 2000] defined five levels of maturity toward the goal of alignment based on the state of communication between business and IT, the measures used to establish competency and value, the governance functions, the level of partnership between IT and the business, the scope and architecture of IT, and the IT skills. The goal was the four-domain alignment first defined by Henderson and Venkatraman [Luftman, Figure 1, p. 12]. Reich and Benbasat [2000] investigated alignment between IT and business strategy. They defined social alignment as being the level of understanding of and commitment to the business and IT mission, objectives, and plans on the part of business and IS managers. Burn and Szeto [2000] also compared the views of IS and business managers and found convergence within organizations, but divergence across organizations, based on the level of IT dependence. Preston and Karahanna [2009] developed the notion of a vision shared by IS and business managers. The concepts used in the alignment maturity model, the social alignment model, and the discussions on shared views and vision could be seen as a consolidation and formalization of Broadbent and Weill's work [1993].

Teo and King wrote several papers on the subject of integration between business planning and IS planning (BP-ISP integration), demonstrating how it contributed to organizational performance and reduced ISP problems [1996], validating a stage hypothesis [King and Teo, 1997], and developing a framework which combined an evolutionary and contingency perspective [Teo and King, 1997]. Kearns and Lederer [2000] further developed this thread of research by looking specifically at the two-way alignment between business and IS plans. They developed their work by looking at the way in which knowledge sharing between Chief Executive Officers and Chief Information Officers can improve strategic alignment [Kearns and Lederer, 2003], linking this latter work to the Resource Based View of the firm. Byrd et al. [2006] explored the different ways in which IS and business plans can be linked, arguing that coordination of planning requires awareness, specificity, participation, and close interaction between planners.

There has also been a stream of work investigating the relationship of alignment to the changing environment. One of the earliest studies used a punctuated equilibrium model of the environment and mapped it to different forms of alignment [Sabherwal et al., 2001]. Irani [2002] extended the idea of alignment with entities outside the boundaries of the organization by discussing the alignment of a business's plans with that of vendor organizations. Two subsequent studies have explored the notion of coevolutionary environment. Peppard and Breu [2003] suggested modeling IS and business strategy in this context, and Benbya and McKelvey [2006] defined alignment at different levels within the organization. More recently, this issue has been explored by operationalizing the Dynamic Capabilities theory to define IT resources as an enactment of IT investment and IT-Business alignment as a reflection of IT investment. The alignment definition used here was "alignment is the ability of the firm to align IT resources and business resources within a strategic framework to achieve organizational advantage" [Schwarz et al., 2010, p. 63]. Another study focusing on dynamic issues looked at the relationship between organizational agility and alignment [Tallon and Pinsonneault, 2011]. Sen and Sinha [2011] also use a dynamic approach to alignment, focusing on the linkage between an evolving customer relationship strategy and the IT infrastructure supporting it.

Surveys of IS manager views no longer focused on aspects of organizational structure. In a series of key issues surveys, a definition was provided by the lead author: "applying IT in an appropriate and timely way, in harmony with business strategies, goals and needs" [Luftman and McLean, 2004; Luftman, 2005, 2006; Luftman and Kempaiah, 2008; Luftman and Ben-Zvi, 2011]. Defined in this way, alignment ranked highly as a concern. This definition has also been used in a recent study of antecedents of alignment, such as shared domain knowledge, planning sophistication, prior IS success, organizational size, and environmental certainty, and the resultant benefits, which were found to be contingent on industry type and business strategic orientation [Chan et al., 2006]. It should be noted that this definition diverges significantly from previously discussed models: it is qualitative and based on practitioner experience. Practitioner definitions were also studied in a recent grounded study of IS managers [Campbell et al., 2005]. While practitioners are no longer defining alignment in terms of organizational structure, a recent academic study has indicated that organizational structure may still have an effect on alignment [Luftman and Kempaiah, 2007].

The divergence in definitions of alignment has, therefore, continued and now includes:

- Alignment as the appropriate and timely application of IT, in harmony with business strategies, goals, and needs

Furthermore, there have been extensions of the alignment concept, including:

- Alignment maturity

- Social alignment and alignment of visions

- Alignment with the environment, based on theories of chaos and coevolution, or based on punctuated equilibrium theory

- Alignment as the ability of the firm to align IT resources and business resources within a strategic framework

Such definitions have extended rather than replaced the earlier ones: indeed, Avison et al. [2004] reviewed different alignment models and argued for the continued validity of the original Henderson and Venkatraman model and demonstrated its use as a practical framework for technology management.

One consistent theme through much of the alignment literature has been that alignment is two-way: IS can lead the business as well as vice versa. The importance of seeing alignment as two-way was reiterated in a review by Luftman and Kempaiah [2007, pp. 165–166]: "IT-business alignment has been … elusive … [one] reason is that the definition of alignment is frequently focused only on how IT is aligned (e.g., converged, in harmony, integrated, linked, synchronized) with the business. Alignment must also address how the business is aligned with IT … IT can both enable and drive business change."

In addition to developments of the concept of alignment, there have been many studies demonstrating the benefits of alignment, using typologies. Table 2 summarizes such studies and also indicates where contingent or surprising results emerge. For a detailed description of alignment measures using typologies, see Chan et al. [1997] and also Chan and Reich [2007a].

Chan's earlier work on alignment benefits [1992] was developed further in a paper that described Business Strategy in terms of Strategic Orientation of the Business Enterprise (STROBE), which depended on such factors as a company's aggressiveness, analysis, defensiveness, futurity, risk aversion, and innovativeness, and IS strategy in terms of The Strategic Orientation of the Existing Portfolio of IS Applications (STROEPIS) [Chan et al., 1997]. Alignment was then measured between the two orientations. It was found that higher alignment was linked with improved business performance. Sabherwal and Chan [2001] developed the theory of alignment with business strategic positioning further by linking the STROBE attributes to the Miles and Snow [1978] typology of organizations as either Defenders, Prospectors, or Analyzers. Three IS strategies are then suggested as providing the best alignment with each of these three types: Defenders require an IS strategy focused on Efficiency, Prospectors require an IS strategy focused on Flexibility, and Analyzers require an IS strategy focused on Comprehensiveness. They found evidence that alignment, defined in these terms, led to improvements in perceived business performance. Sabherwal et al. [2001] also used the Miles and Snow [1978] typology and developed a typology for business structure as organic, semi-structured, mechanistic, centralized, hybrid, or decentralized. They also defined information systems strategy as nonstrategic, low cost, differentiation, growth, innovation, and alliance, and the information systems structure as centralized, shared, and decentralized. They examined the alignment of IS and business responses as the business environment went through periods of relative equilibrium, "punctured" by periods of rapid change.

Palmer and Markus [2000] used typologies that define business strategy according to a pipeline strategy of supplier focus, internal focus, or customer focus, using a Retailer's Strategic Value System defined from Holland, Lockett, and Blackman [1992]. Each of these strategies can be aligned to a corresponding IT strategy: supplier partnering, transaction efficiency, and customer detail respectively, derived from Treacy and Wiersema [1995]. Interestingly, this study found little support for the benefits of alignment. Tallon et al. [2000] used a different typology again. They defined business strategy in terms of Porter's strategic positioning and then produced a typology of IT goals: Market-focused IT has the goals of extending market or geographic reach and changing industry practices. Operations-focused IT has the goals of cost reduction, improved quality and speed, and enhanced overall firm effectiveness. Dual focused has both these sets of goals, and unfocused has neither. Executives in firms with more focused goals were perceived to have higher levels of strategic alignment.

Bergeron et al. [2004] took a gestalt view, defining coalignment between business strategy, business structure, IT strategy, and IT structure and investigating its effect on business performance. They used a STROBE typology of business strategy, a business structure typology based on formal complexity, an IT strategy construct consisting of environment scanning and strategic use of IT, and an IT structural construct consisting of methods of planning and control and of IT acquisition and implementation. They clustered organizations into four groups according to strength of strategic orientation and complex structures. They found that benefits from alignment were contingent on these groups: alignment benefited organizations with strong strategic orientation and complex structures, but not ones with little strategic orientation and simple structures.

Table 2: Alignment Studies Using Typologies			
Study	Business typology	IS typology	Contingency
Chan et al. [1997]	Strategic Orientation of the Business Enterprise (STROBE)	Strategic Orientation of the Existing Portfolio of IS Applications (STROEPIS)	
Palmer and Markus [2000]	Pipeline strategy: supplier focus, internal focus, customer focus [Holland et al., 1992]	Supplier partnering, transaction efficiency, customer detail [Treacy and Wiersema, 1995]	No benefits demonstrated from alignment
Tallon et al. [2000]	Porter's strategic positioning [Porter, 1980]	Market focused, Operations focused, Dual focused	Higher alignment where focus was clear
Sabherwal and Chan [2001]	Defenders, Prospectors, Analyzers [Miles and Snow, 1978]	Efficiency, Flexibility, Comprehensiveness	
Sabherwal et al. [2001]	Miles and Snow [1978] plus organic, semi-structured, mechanistic, hybrid, and decentralized structure	Nonstrategic, Low Cost, Differentiation, Growth, Innovation, Alliance, plus centralized, shared, decentralized management	Alignment did not always change as expected when the dynamics of the external environment changed.
Bergeron et al. [2004]	Business strategy: STROBE Business structure: formal complexity	IT strategy: environmental scanning and strategic use IT structure: methods of planning, control, acquisition, and implementation	Alignment benefited organizations with strong strategic orientation and complex structures, not those with little strategic orientation and simple structures.
Weiss et al. [2006]	Internal integration and external market engagement	IT as: technical resource, business enabler, strategic weapon	
Tallon [2007–8]	Primary processes of value chain [Porter 1985, 1998]	IS focused on operational excellency, customer intimacy, product leadership [Treacy and Wiersema, 1995]	Type of fit varies within firm depending on process

Weiss et al. [2006] drew on the work of Porter [2001] and Earl and Feeny [2000] to construct three alignment profiles that "define the purpose and nature of IT before IT investments receive approval" (p. 679). These are technical resource, business enabler, and strategic weapon. Levels of both internal integration of IT and the business and external market engagement of IT depend on the alignment profile. Tallon [2007–8] extended his earlier work [Tallon et al., 2000] by looking at the way in which the role of IT is aligned with the Treacy and Wiersema [1995] value disciplines of Operational Excellence, Customer Intimacy, and Product Leadership.

A main contribution of Tallon's work is to suggest that alignment should be investigated at the process level—using the primary processes defined in Porter's [1985] value chain. By doing so, "we go beyond discussion of the extent of fit—a cornerstone of the literature—to whether firms are pursuing the right kind of fit for the particular mix of processes underlying their strategy" (p. 227). Tallon also points out that alignment at the process level might be causally ambiguous and, therefore, more difficult for organizations to detect, hence, leading to a resource-based approach.

Typologies, then, have been used both to measure alignment and, in some studies, to demonstrate its consistency. However, the typologies used have added to the divergence of the studies, and there is currently no clear pattern to guide our understanding of how they are related.

Business typologies have included:

- Levels of aggressiveness, defensiveness, etc. (STROBE, Miles and Snow)
- Porter's strategic positioning
- Primary processes of the value chain

IS strategy typologies have included:

- STROEPIS

- Support for Treacy and Wiersema Value disciplines

- IS support for efficiency, flexibility, and comprehensiveness

- IS environmental scanning, strategic use, methods of planning, control, acquisition, and implementation

- IS as technical resource, business enabler, and strategic weapon

- IS as nonstrategic, low cost, differentiation, growth, innovation, and alliance

Problems with Divergence for Practitioners and Academics

Alignment studies, then, have used divergent definitions. Benefits, sometimes contingent, have been demonstrated in a series of studies, but the relationship between these studies is not always clear. This can be problematic for both practitioners and academics.

From a practitioner perspective, what is the goal of alignment? Alignment of organizational structures? Alignment between IS and business Strategy? Alignment as a series of Information Based Comparative Advantages? Alignment with a changing environment? Or alignment as the appropriate and timely application of IT, in harmony with business strategies, goals, and needs?

What helps achieve alignment? Specific organizational practices? Alignment maturity? Social alignment? Clearer focus of the organization? And is alignment worth achieving—what contingencies are there around it? Strength of strategic orientation and complexity of structure? Industry type? Specific primary process under consideration? Arguably, models of alignment are now so diverse that there is no clear picture for practitioners.

This divergence also provides problems for academics seeking to contribute to the body of knowledge regarding alignment. Where are the gaps in our knowledge? Can we say that a stream of studies, each using a different definition of alignment, is contributing to a coherent body of knowledge? How well have we captured all the antecedents to alignment? Have all the contingencies around achieving alignment now been explored? Do we now have adequate models of alignment with the dynamic environment? Chan and Reich [2007a] have expressed concern that there is a lack of theoretical foundation in alignment studies (p. 311). Strategic theories have been espoused in several studies, but is there any pattern to how these should be used?

The contribution of this article is to provide a meta-model of alignment, to provide practitioners with a means of understanding where, when, and how they should seek alignment, and to provide academics with an overview of our patterns of understanding. The meta-model is developed by examining three different theories of strategy as a framework for categorizing alignment studies. Existing alignment studies, placed within the meta-model, are then used as a means of exploring the quality of three different types of alignment and, hence, producing definitions of each type. The next stage of the argument, then, is to provide an overview of the theories of strategy being discussed.

III. STRATEGIC THEORIES

Table 3 summarizes the theories discussed in this section.

An overview of each theory is given below, and then the complementarities and differences among the three are discussed.

Industry Positioning

Throughout the 1980s and early 1990s, the dominant strategic theory was based on the placement of the firm within an industry structure. The predominant model was the five forces model developed by Porter [1980]. This model, based on economic theory, was designed to help a firm analyze the attractiveness of an industry by predicting the relative strength of buyer and supplier power, the barriers to entering the industry, the threat of substitute products, and the rivalry of firms within the industry. In order to compete within an industry, a firm needed to use one of three possible generic strategies—providing cost leadership, providing a differentiated product or services, or focusing on a particular niche within the industry.

Porter then asked the question: how can organizations pursue these generic strategies? In order to answer that question, he developed an activity-based theory of the firm to help analyze sources of competitive advantage. These activities could then be grouped in a value chain, consisting of the primary activities, which generate value for the

Table 3: Summary and Comparison of Strategic Theories			
Strategic theory	Strategy definition	Activities	Resourcing
Industry positioning	Strategic position →	Value chain activities →	Resources
	Analyze position using five forces: buyer power, supplier power, barriers to entry, threat of substitutes, rivalry of other firms. Define generic strategy Cost leadership Differentiated product/service Niche offering	Value chain activities arise from strategic position: Primary: inbound logistics, operations, outbound logistics, marketing, and sales Secondary: Firm infrastructure, HRM, Technology development, procurement	Resource requirements arise from value chain. This is not assumed to be problematic or the subject of time lags.
Resource Based View	Strategic position ←	Routines (capabilities) ←	Unique resource bundle
	Sustainable competitive advantage arises because competitors cannot develop the same capabilities.	Capabilities/organizational routines arise from the unique combination of resources	Firm has resources which are Valuable, Rare, Inimitable, Non-Substitutable
Dynamic Capabilities	Semi-coherent strategy	← dynamic capabilities →	Substantive capabilities
	Strategic position continuously considered in unpredictable environment	Improvisation, trial-and-error learning, experimentation, often within a rhythm, or time-pacing	Abilities and resources which solve a problem or achieve an outcome

customer and support activities, which provide the inputs and infrastructure required by the primary activities. Unlike the five forces model, the value chain "had no clear antecedents in the literature" [Porter, 1985, p. xvii].

Treacy and Wiersema [1995] produced another influential framework with regard to generic strategies for a firm's market placement, based on their own primary research. They defined three disciplines, namely, operational excellence, product leadership, and customer intimacy and suggested that a firm should be a leader in one and maintain "threshold standards" (p. 22) in the others.

Resource Based View

The Resource Based View asserts that, while industry positioning models can be used to analyze an organization's competitiveness at any given time, they do not indicate how that organization can remain competitive over time. Sustained competitive advantage, according to the Resource Based View, depends on an organization's unique combination of resources. Resources "include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc., controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" [Barney, 1991, p. 101]. Barney categorized these capital resources into physical, human, and organizational. Resources give an organization a sustained competitive advantage when they are Valuable, Rare, Inimitable, and Non-Substitutable (VRIN). Valuable resources allow an organization to exploit opportunities or neutralize threats to the environment; the rarity of resources among competitors gives an organization an advantage; inimitability means those resources are difficult for a competitor to imitate, and non-substitutability means that there are no strategic equivalents for them [Barney, 1991]. A firm's capabilities are defined as "what it can do as a result of teams of resources working together" [Grant, 1991, p. 120], and are also described as organizational routines.

As Rivard et al. [2006] discussed, there has been a stream of literature applying the resource-based theory to IT. Mata et al. [1995] suggested that access to capital for sometimes risky projects, proprietary technology, technical IT skills, and managerial IT skills are all examples of IT resourcing that affect strategy. Bharadwj [2000] grouped IT resources into infrastructure, human IT resources, and IT-enabled intangibles and looked at the relative profitability of firms which were well-resourced in these terms (IT leaders) with firms which were not. The IT leaders demonstrated better profit and cost ratios. Wade and Hulland [2004], referring to Day's work [1994], provided a typology of IS resources: outside-in, which includes external relationship management and market responsiveness; spanning, which includes IS-business partnerships and IS planning and change management, and inside-out, which includes IS infrastructure, IS technical skills, IS development, and cost-effective IS operations.

Wade and Hulland [2004] pointed out that resource complementarity has not been extensively developed within the Resource Based View, where complementarity is defined as how one resource may influence another and how the relationship between them affects competitive position or performance. This is particularly important for "IS

resources that, in almost all cases, act in conjunction with other firm resources to provide strategic benefits" (p. 123). Nevo and Wade [2010] have recently suggested that by synthesizing the concept of synergy in systems theory with that of the strategic potential represented in the Resource Based View they can shed light on the relationship between organizational resources and IS resources.

Piccoli and Ives [2005] discussed the fact that the inimitability of resources may not last in perpetuity, but will occur for the duration of the time lag that it would take for another firm to acquire those resources. The source of this time lag can be one, or both, of two resource acquisition processes: organizational learning and asset stock accumulation. Hence, an important concept within the Resource Based View is that an organization's resources are dependent on its history.

Dynamic Capabilities and Strategy

Dynamic Capabilities theory defines substantive capabilities as "the set of abilities and resources which go into solving a problem or achieving an outcome" [Zahra et al., 2006, p. 921], a definition similar to that used in the Resource Based View. Dynamic Capabilities, by contrast, have been defined as "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" [Teece et al., 1997, p. 516], or, more recently, as "the abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision-makers" [Zahra et al., 2006, p. 918]. The focus, then, is on the way in which an organization scans the environment and adapts its resource-base as it sees fit. Dynamic Capabilities assumes that decision-makers consciously consider industry position, but that, because the environment changes so quickly, this cannot be done formally. Strategy has to be "semi-coherent." It is "unpredictable" (the future is uncertain), "uncontrolled" (it is achieved not by command and precision planning by senior executives, but by many people making many moves on their own), "inefficient" (it includes making mistakes, duplication, and error), proactive (it involves trying to anticipate and, where possible, lead change), continuous (it involves a rhythm of moves over time), and diverse (it consists of a variety of moves with varying scale and risk) [Brown and Eisenhardt, 1998, pp. 7–9].

Learning theories provide a basis for understanding dynamic capabilities. Three learning types are distinguished: improvisation: "real-time, unplanned experience in which action forms design as it occurs"; trial-and-error learning where planned or unplanned actions inform future action; and experimentation, a more deliberate and systematic approach to learning cause–effect relationships [Zahra et al., p. 932]. Chaos and Complexity theories also inform this view [Brown and Eisenhardt, 1997, 1998; Eisenhardt and Brown, 1998; Eisenhardt and Martin, 2000]. Those firms that assume change "typically develop a rhythm or habit in their application of dynamic capabilities" [Zahra et al., 2006, p. 929]. More specifically, they will often adopt time pacing, where new products and services are introduced on a calendar basis, rather than being a reaction to events. A firm may aim to create a new product every nine months, for example, or generate 20 percent of annual sales from new services [Brown and Eisenhardt, 1998, p. 167].

For slower paced industries, the punctuated equilibrium model has been used. This assumes that periods of relative stability, or equilibrium, are punctuated by periods of revolutionary change [Sabherwal et al., 2001].

Complementarities and Differences Between Strategic Approaches

These three approaches are related to each other. Porter's value chain, for example, which is designed to complement the five forces model, is based on activities, or processes, which could be seen as resources which could in some cases be valuable and inimitable. Treacy and Wiersema [1995] defined core competencies of a company as being "what it's good at" and, as such, helping it to decide on its value discipline—although they stress that competencies alone are insufficient for this, as they "don't help managers balance the management of core and secondary processes, structure and culture": for that a business model is necessary (p. 27). The Dynamic Capabilities approach incorporates the notion of substantive capabilities [Zahra et al., 2006, p. 921], which are defined in a similar way to the capabilities in the Resource Based View. The Dynamic Capabilities literature also discusses the way in which an organization considers its industry position, stressing, however, the semi-coherence of its strategy [Brown and Eisenhardt, 1998, pp. 7–9].

Amit and Scheomaker [1993] provided one of the first papers to utilize both industry positioning and the Resource Based View. They suggested that the two theories are complementary, but not closely linked. An organization cannot, with certainty, identify "ex ante" a mix of resources, or capabilities, which will ensure its long-term market position. Spanos and Lioukas [2001] also compared the Resource Based View and the industry positioning approach. They discussed areas in which the two theories complement each other. They suggested that, in terms of the SWOT analysis, the Resource Based View focuses on Strengths and Weaknesses, whereas Porter's framework looks at Opportunities and Threats. They also point out that both frameworks have the same phenomenon of interest

and unit of analysis. Furthermore, each theory is based on the premise that an organization can receive persistent, above-normal returns. However, there is a difference in outlook—Porter's work is based on the idea that an organization sustains a competitive advantage by offering value to the buyer either in terms of lower costs or in terms of differentiation of product. This can be seen as monopoly rent, which can be maintained by defensive or offensive means. The Resource Based View, on the other hand, is based on the idea of a bundle of resources which generate value via efficiency rent. According to Porter, strategic activities and environmental acquisitions lead to resource decisions, but these resources have no intrinsic strategic value. By contrast, the Resource Based View states that opportunities in the market combined with constraints from assets lead to strategies [Spanos and Lioukas, 2001].

Rivard et al. [2006] extend Spanos and Lioukas's model to provide an integrated perspective. They add measures of IT's contribution to value. They then provide supporting evidence for their model using survey data. They also suggest that Henderson and Venkatraman's [1993, 1999] model provides a theoretical basis for integrating strategic views. This is discussed further in the following section.

Table 3 provides a summary comparison. All three strategic theories are concerned with the position of an organization within an industry, the strategic activities it undertakes, and the resources it requires. There are, however, differences in the emphasis, assumptions, and theoretical underpinnings of the three views. Each has a different approach to the ways, means, and ends of strategic advantage [Ward and Daniel, 2006, p. 58]. The industrial positioning view focuses on the strategic "end" and links resources (means) to those ends via the activities (ways) of the value chain. It does not discuss the implications of the historical development of such resources, nor does it investigate how the organization reacts to changes in its position within an industry. The Resource Based View focuses on the importance of the historical development and combination of resources in understanding the uniqueness of a particular organization's resource base (means). This resource base manifests itself in a series of capabilities and organizational routines (ways) that retain its strategic position (end). That position is not explicitly analyzed. Dynamic capability theory looks at the way in which ever-changing industry positions (ends) are supported by ever-changing resources (means), with a focus on the ways in which that balancing act occurs.

IV. MAPPING ALIGNMENT MODELS TO STRATEGIC THEORIES

The relationship between the alignment models and their precursors—strategic information systems planning (SISP), IT for competitive advantage (ITCA)—and the literature on strategy has been affected by comparative timelines, as shown in Table 4.

As Table 4 shows, much of the early SISP, ITCA and alignment literature was developed *before* the seminal works on the Resource Based and Dynamic Capabilities had been published but *in parallel* with industry positioning theory. As a consequence of this timing, early works on SISP and alignment which implicitly examine the development of resource bundles do so without reference to the Resource Based View or Dynamic Capabilities. Early work on ITCA and alignment models examining industry position, by contrast, were able to draw on strategic theory in this area.

Later works on alignment have to draw on two separate streams of literature: that on alignment and that on strategic theory. A contribution of this article is to provide a model that consolidates these two streams by comparing and contrasting the assumptions within them.

Table 4: Comparative Timelines for Alignment Models and Strategic Theory				
Timeline	1970s	1980s	1990s	2000s
Alignment models, SISP, ITCA	Stages of Growth, SISP McFarlan, 1971; McLean, 1977; King, 1978	SISP, ITCA McFarlan, 1984; Sullivan, 1985; Henderson and Treacy, 1986; Galliers, 1987	First alignment models Henderson and Venkatraman, 1993; Broadbent and Weill, 1993	Development of broad alignment literature
Strategic theory		Industry position Porter, 1980, 1985	Resource Based View Barney, 1991; Mata, 1995	Dynamic Capabilities Eisenhardt, 2000; Zahra, 2006

Table 5 gives a mapping of the alignment papers previously discussed, using the definitions of alignment discussed in the previous section. In creating this mapping, papers have been assessed both in terms of the strategic approach implicit in them and in terms of their subsequent development by authors using similar concepts. The papers are then used to imply the qualities of each type of alignment and, hence, produce alignment definitions.

Table 5: Mapping of Alignment Models Within the Framework of Strategic Theory			
Theory	Strategy definition	Activities	Resourcing
Positional alignment	ITCA [Parsons, 1983; McFarlan, 1981, 1984; Ives and Learmonth, 1984]		
	Five forces influencing organization's objectives [Scott-Morton, 1991]		
	Business, IS strategy, structure aligned [Henderson and Venkatraman, 1993]		
	Business, IS strategic orientation aligned [Chan et al., 1997; Sabherwal and Chan, 2001]		
	Alignment of organization's plans with vendor's [Irani, 2002]		
	Validating Henderson and Venkatraman's alignment model [Avison et al., 2004]		
	Three alignment profiles of business, IS strategy, structure [Weiss et al., 2006]		
Resource alignment	SISP [McFarlan, 1971; McLean and Soden, 1977; King, 1978; Rockart, 1979; Henderson et al., 1987]		
	IS and the organization [Sullivan, 1985; Henderson and Treacy, 1986; Earl, 1993]		
	Stages of growth [Nolan, 1973; Galliers, 1987, 1991a, 1991b]		
	Organizational policies and practices contributing to alignment [Broadbent and Weill, 1993]		
			Social alignment [Reich and Benbasat, 2000]
			Alignment preconditions [Chan, 2002]
	CIO/CEO knowledge sharing and business/IT plans [Kearns and Lederer, 2000, 2003]		
	Shared perceptions of IT and business managers [Burns and Szeto, 2000]		
	Resources required to coordinate planning [Byrd et al., 2006]		
	Alignment maturity [Luftman, 2000, Luftman and Kempaiah, 2007]		
	Alignment of CIO/CEO vision [Preston and Karahanna, 2009]		
	Evolution of resources to align with strategy [Sen and Sinha, 2011]		
Dynamic capabilities and alignment	Alignment and punctuated equilibrium theory [Sabherwal et al., 2001]		
	Coevolution and alignment [Peppard and Breu, 2003; Benbya and McKelvey, 2006]		
Contingent models—resources and position	Business, IS strategic orientation aligned [Chan, 2006] (position)		Alignment antecedents [Chan, 2006] (resource)
	Business strategic orientation [Bergeron et al., 2004] (position)	IS strategy, structure gestalt coalignment [Bergeron et al., 2004] (resource)	
		Causally ambiguous processes [Tallon, 2007–8] (resource aligned with) Alignment at value chain activity level [Tallon 2007–8] (position)	
Contingent models—dynamic capabilities and position	… and their relationship with strategic alignment [Schwarz et al., 2010]		Dynamic resources … [Schwarz et al., 2010]
	… and the moderating effect of strategic alignment [Tallon and Pinsonneault, 2011]		Organizational agility … [Tallon and Pinsonneault, 2011]

Positional Alignment

The work on IT for Competitive Advantage produced the first mappings between information systems and the position of an organization within its industry. Often, this took the form of identifying particular strategic information systems and indicating how they changed an organization's strategic position. McFarlan [1981] first discussed the

importance of defining a portfolio of IS applications and analyzing their strategic role. Parsons [1983] gave examples of changes that IT could make at industry level (the publishing industry moving from being paper-based to electronically-based), at firm level (for example, a large medical supply company providing online order entry which had the effect of raising switching costs for its customers), and to the basis of competition (for example, a manufacturing firm achieving product leadership by using IT to increase quality control and precision). McFarlan [1984] also gives examples of systems which have been used to make such change (for example, a magazine distributor able to make use of the information it gathered in selling to newsstands to help those newsstands improve their product mix, hence changing its strategic position from low cost to product differentiation).

Scott-Morton [1991] identified, more generally, how an organization was positioned within the external technological and sociotechnical environment and would be affected by technology as one of five forces influencing its organization's objectives. The Henderson and Venkatraman [1993] model, which was a development of the Scott-Morton work, investigated how alignment can fulfill an organization's objectives. As has been well documented, this model depicts arrows in all directions between business strategy and structure. However, closer inspection of the original paper reveals that the arrows depict four specific mechanisms, all of which originate either from IT or business strategy, namely: Strategy Execution, where business strategy is the driver of organizational design choices and IT/IS infrastructure design; Technology Transformation, where business strategy dictates a particular IT strategy, which then dictates the required IT/IS infrastructure design; Competitive Potential, in which potential IT capabilities are embedded in the IT strategy, which dictates business strategy and, hence, organizational structure; and Service Level Alignment, in which IT strategy dictates IT infrastructure and processes, which dictates organizational infrastructures.

It could, hence, be argued that the Henderson and Venkatraman model of alignment can be seen as driven by the organization's view of strategic positioning.

Analysis of the sub-domains, reinforces the idea that this alignment model is informed by an industry positioning view. IT and business strategy are defined by their scope, governance, and competencies—a similar notion to the generic strategies of Porter [1980, 1985] and Treacy and Wiersema [1995]. Organizational and IS infrastructure and processes include processes, skills, and infrastructure/architecture. It should be noted that Luftman [2000] emphasized the importance of these sub-domains by updating them and using this as the basis for specifically expanding the alignment domains to twelve.

Furthermore, Henderson and Venkatraman's model embraces neither the key concepts of the Resource Based View: historical development of unique resource bundles for an organization, nor of the Dynamic Competencies View: of time-based change to adapt to a semi-coherent strategy.

Many of the typology-based models discussed earlier (see Table 2) assume an industry positioning perspective: the activities of the organization arise out of the assumed position. The business typology of STROBE [Chan et al., 1997; Bergeron et al., 2004] is based on a company's approach to its strategic position: whether it is aggressive regarding cost-cutting to increase market share; what level of detail it relies on in its analysis; whether it takes an internally or externally defensive approach; whether it is forward looking; whether it is proactive, risk averse, or innovative [Chan et al., 1997, p. 128]. STROBE has been linked to the Miles and Snow [1978] analysis of Defenders, Prospectors, and Analyzers [Sabherwal and Chan, 2001], which, similarly, assumes an analysis of industry position as its basis. Palmer and Markus [2000] use a pipeline strategy which is based on the focus of the industry. Tallon et al. [2000] explicitly use Porter's strategic positioning models as the basis of a business typology. IS typologies are based on whether they align with the business strategic position. Many of them extend the early notions of strategic IS applications, sometimes in the form of a portfolio [Macfarlan 1981, 1984; Parsons, 1983]. For example, STROEPIS [Chan et al., 1997, p. 128] explicitly considers the strategic orientation of IS applications in terms of their support for each of the STROBE elements. The typology of efficiency, flexibility, and comprehensiveness used in Sabherwal and Chan [2001] mirrors the Miles and Snow [1978] typology. Palmer and Markus [2000] use Treacy and Wiersema [1995] as the basis of their IS typology. Tallon et al. [2000] uses an IS typology based on whether IS is market, operations, or dual focused. Weiss et al. [2006] draw directly on the work of Porter in their definitions of alignment profiles.

Based on these studies, positional alignment would have the following characteristics:

- The strategic position of IS reflects and informs the position taken by the business. This is often reflected in terms of a portfolio of systems which best suits such a position. For example, if a business was pursuing a low-cost strategy [Porter, 1985, 1998], then it may well take an aggressive, cost-cutting approach, for example, which would be best matched by an IS deployment which provided support for this aggressive approach [Chan et al., 1997]. Alternatively, the business might be typified as a Defender and require an IS

strategy focused on Efficiency [Sabherwal and Chan, 2001]. IS could be defined as market focused, dual focused, or operations focused, depending on its strategic position [Tallon et al., 2000].

- The value chain and other activities pursued by the business are informed by its strategy [Porter, 1985, 1998]. IS support may need to be focused on specific value chain activities in order to provide the "right" fit: alignment that provides business benefits [Tallon 2007–8].

- Resources should be provided in both business and IS to ensure that appropriate activities can be supported [Henderson and Venkatraman, 1993]. Note that the emphasis here is on specific resources being in place, not on the history of development of those resources. The structure of delivery of IS resources should reflect the organizational structure of the business.

The following definition of positional alignment arises from these qualities:

Positional alignment is the process of ensuring that the business and IS support each other in analyzing a particular market position, aiming for that position via appropriate value-added activities and maintaining it by ensuring appropriate resources are available and positioned correctly within the organization.

Resource Alignment

While predating key papers on the Resource Based View by almost twenty years, many of the early Strategic Information Systems planning papers are clearly concerned with the development of IS resources over time, in ways which make them Valuable, Rare, Inimitable, and Non-Substitutable (VRIN). King [1978], provided one of the first detailed descriptions of an information systems planning process which would have the potential of developing such a resource base. Henderson and Treacy [1986] discussed, in detail, the way the bundle of resources of end-users and their support evolves, in terms of training, data, technology, standards, and investment evaluation. Stages of growth models also provide a sense of the history of resource development [Nolan, 1973; Galliers, 1987, 1991a, 1991b].

In contrast to Henderson and Venkatraman [1993], Broadbent and Weill's early alignment model [1993] can be seen as taking a resource-based approach and developing many of these early concepts. Competencies such as "experience of firm-wide planning, planning focused on critical and long term issues, decision-making processes appropriate to strategic orientation, development of IS understanding of business managers, and business skills in IS managers" [Broadbent and Weill, 1993, p. 175] are all examples of resource combinations that are Valuable, Rare, Inimitable, and Non-Substitutable. In addition, many of these depend on the historical development of resources—a key feature of the Resource Based View. As touched on by Schwarz et al. [2010], this alignment model, along with many subsequent models, contributed to the Resource Based View by defining complementarities between IS- and non-IS-based resources. Reich and Benbasat [2000] developed and formalized many of these concepts in their definition and discussion of the social dimension of alignment. Social alignment consists of "short-term alignment … the state in which business and IT executives understand and are committed to each other's short term … plans and objectives … and long-term alignment ... defined as ... the state in which business and IT executives share a common vision of the way(s) in which IT will contribute to the success of the business unit" [Reich and Benbasat, 2000, p. 87]. The social dimension of alignment develops further the notion of the history of resource development in an organization, explicitly listing successful IT history and shared domain knowledge as two of its antecedents, along with communication practices between business and IT executives and connections between business and IT planning. Kearns and Lederer [2000, 2003] explicitly link their work on alignment and knowledge sharing between Chief Executive Officers and Chief Information Officers to the Resource Based View. Chan [2002] specifically recognizes a gap in previous, industry positioning work with the title "Why haven't we mastered alignment?" She defines a series of preconditions to alignment, such as communication and understanding between business and IS executives, linked business IS missions, priorities, planning processes and plans, line executive commitment to IS issues and initiatives, IS skills for line personnel, and business skills for IS personnel, formal reporting relationships, informal networks and relationships, appropriate career paths, and incentives/rewards and performance measurement (p. 105). These preconditions bear many similarities with the work of Broadbent and Weill [1993] and Reich and Benbasat [2000].

The alignment maturity model [Luftman, 2000; Luftman and Kempaiah, 2007] represents the bundling of resources in ways which are typical of the Resource Based View, and the concept of maturity implicitly embraces an historical view of resource bundle development. More recently, Sen and Sinha [2011] have described the evolution of IS resources to support Customer Relationship Management within an organization.

Based on these studies, a resource-based definition of alignment would have the following qualities:

- IS resources would complement business resources in ways which ensured that the bundle of resources were Valuable, Rare, Inimitable, and Non-Substitutable (VRIN). The focus would be on developing resources over time, for example, "development of business skills in IS managers" [Broadbent and Weill 1993].
- These complementary IS and business resources would lead to capabilities, and organizational routines which would form the basis of the organization's long term competitive advantage.

The following definition of resource-based alignment arises from these qualities:

Resource alignment is the historical and ongoing development of complementarity between the bundle of IS resources and the bundle of business resources resulting in capabilities that allow for a sustained competitive advantage.

Dynamic Alignment

There have been two main approaches to studying the dynamics of alignment. The earliest approach looked at how alignment changed from one alignment steady state to another, in the context of an environment characterized by a dynamic equilibrium [Sabherwal et al., 2001] This study used a positional alignment approach to describe each alignment steady state in terms of typologies, using the Miles and Snow [1978] typology for business strategy, describing IS strategy as non-strategic, low cost, differentiation, innovation or alliance, business structure as organic, semi-structured, mechanistic, centralized, hybrid, and decentralized, and IS management as centralized, shared, or decentralized. Using three case studies, the paper analyzed how the alignment of an organization changed as that organization went through periods of slow, evolutionary change and rapid, revolutionary change and found evidence that alignment may also go through evolutionary and revolutionary phases.

The second approach has, in keeping with the strategic theory of Dynamic Capabilities, used concepts of chaos and coevolution. Peppard and Breu [2003] first suggest the use of coevolutionary theory specifically for the study of alignment. They use McKelvey's [1997] definitions of the characteristics of the environment, namely, uncertainty, complexity, munificence, graininess, fitness, and niches. They point out that organizations are "linked inextricably" with other organizations and that clusters of organizations inherit landscapes, so that their actions affect other organizations, and they are affected by the actions of other organizations. Strategic alignment in this context allows for mutual adaptation and change between business and IS strategies "not just as a matter of alignment, but as a dynamic interplay of coevolving interactions, interrelationships and effects … that is impacted by a complex set of dynamically changing forces." They point out that, at this stage, the set of forces they identify are illustrative, and that empirical research would allow a more comprehensive model.

Benbya and McKelvey [2006] define alignment as "a series of coevolutionary moves that make IS aligned over time." They suggest a model that shows coevolution between the individual level (coevolving IS infrastructure and user needs), the operational level (coevolving business and IS domains), and the strategic level (coevolving business and IS strategies). They suggest that coevolution of IS alignment can be improved by using five of McKelvey's [2004] seven 1st principles of efficacious adaptation, namely, fostering coevolution, applying tension when and where needed, improving requisite complexity, taking advantage of modular design, and speeding up the rate of change. They also suggest that coevolution of alignment at the three levels they define is best achieved by using scale-free dynamics.

Two recent papers on alignment have specifically discussed the relationship between IS and a rapidly changing environment in terms of specific dynamic capabilities [Schwarz et al., 2010] and organizational agility [Tallon and Pinsonneault, 2011]. Both these works are discussed further in the section on contingent alignment models.

The main quality of this stream of literature, which could be regarded as relatively new, is that IS and the business coevolve both with each other and the external environment. This leads to the following definition:

Dynamic alignment is the coevolution of IS and the business in complex, rapidly changing environments to support semi-coherent strategies by ensuring appropriate, changing substantive capabilities are available. It investigates the way in which IS affects the nature of organizational agility and how it is related to Dynamic Capabilities.

Contingent Studies Linking Different Types of Alignment

While most of the contingent studies described in this article are based within the framework of positional alignment, there are a few recent studies which suggest that one form of alignment can be contingent on particular features of another form of alignment—potentially providing an exciting link between strategic theories.

Key to these particular contingency studies is that they take one *aspect* based on one type of strategic theory and analyze its relationship to one *aspect of another type of strategic theory.* In other words, they deepen our understanding of the *links between strategic theories* discussed earlier in this article. Contingency studies have been done which link aspects of industry position with resources [Bergeron et al., 2004; Chan et al., 2006; and Tallon, 2007–8]. More recently, two studies have linked aspects of industry position with Dynamic Capabilities [Schwarz et al., 2010; Tallon and Pinsonneault, 2011].

Regarding the studies linking industry position with resources: Bergeron et al. [2004] take a gestalt view, and define the coalignment between business strategy, business structure, IT strategy, and IT structure and investigate its effect on business performance. They use the STROBE typology of business strategy, consistent with positional alignment, but their description of IT strategy and IT and business structure has more parallels with resource alignment. They define IT strategy in terms of environment scanning and the strategic use of IT and their IT structure in terms of methods of planning and control, and of IT acquisition and implementation. Their business structure is based on a typology of formal complexity. They clustered organizations into four groups according to strength of strategic orientation and complexity of structure. They found that benefits from alignment were contingent on these groups: alignment benefited organizations with strong strategic orientation and complex structures, but not ones with little strategic orientation and simple structures.

Chan et al. [2006] defines antecedents to alignment which draw on previous literature, including Reich and Benbasat [1996] and Kearns and Lederer [2003]. These antecedents include shared domain knowledge, planning sophistication, and prior IS success, arguably resource-based concepts. Notably, Chan departs from her own previous definitions of strategic alignment and uses a broad definition of alignment similar to that used in the latest Society of Information Management reviews [Luftman and McLean, 2004; Luftman, 2005, 2006; Luftman and Kempaiah, 2008]. The definition is "applying information technology (IT) in an appropriate and timely way and in harmony with business strategies, goals and needs" [Luftman and Brier, 1999, p. 109]. The study then examines how alignment is contingent on two things: industry type—by comparing data from academic and business firms, and business strategic orientation—using the Miles and Snow [1978] typology of Prospector, Analyzer, and Defender. It should be stressed that the Miles and Snow typology is not used here as a measure of alignment—rather it is used as part of a contingency model. Hence, Chan uses a resource-based alignment model and, via a contingency, provides links with positional alignment.

Tallon's study [2007–8] regarding investigation of alignment at the process level has already been discussed. Notably, Tallon suggests that some processes within the value chain may be causally ambiguous and that, where this is the case, there are parallels with the Resource Based View.

Regarding the studies linking industry position and Dynamic Capabilities: in both cases, the possibility that strategic alignment might reduce the ability of an organization to remain dynamic is considered. Schwarz et al. [2010] defined business processes which have been enabled by "business applications that use global IT infrastructure (p. 66) as being a dynamic resource. They found that IT-business alignment, defined as "the extent to which top management is committed to aligning IT and business strategy for competitive advantage" (p. 67), did not produce any lag on the dynamic capabilities of the organization. Tallon and Pinsonneault [2011] used the alignment definition of "the extent of fit between information technology and business strategy" (p. 464) and found that alignment was positively related to agility.

Contingent alignment, then, can be defined as follows:

Contingent alignment is the study of how resource-based alignment, dynamic capabilities alignment, and/or positional alignment interact.

V. A META-MODEL OF ALIGNMENT

A meta-model of alignment, based on the definitions and discussion above, is shown in Figure 1. In keeping with a theme which is consistent in most alignment studies, it is assumed IS informs the business as well as being informed by it.

VI. DISCUSSION

Mapping previous alignment models to the proposed meta-model confirms that it provides a feasible way of categorizing the literature, and providing a framework allowing the exploration of how alignment can systematically contribute to and incorporate theories of strategy. The implications for practitioners and academics are discussed below.

Strategic theory		Strategy definition	Activities	Resourcing
Industry positioning		*Positional alignment* is the process of ensuring that the business and IS support each other in analyzing a particular market position, aiming for that position via appropriate value-added activities and maintaining it by ensuring appropriate resources are available, and positioned correctly within the organization.		
	Business	Plan position, define generic strategy →	Undertake value chain activities →	Organize and resource activities
		↕	↕	↕
	IS	Develop strategy appropriate for → planned position	Provide support for value chain → activities	Organize and resource activities
Resource Based View		*Resource alignment* is the historical and ongoing development of complementarity between the bundle of IS resources and the bundle of business resources resulting in capabilities that allow for a sustained competitive advantage.		
	Business	Sustain competitive advantage ←	Produce capabilities/ organizational ← routines	Develop VRIN resources
		↕	↕	↕
	IS	Support sustained competitive ← advantage	Produce or support capabilities ←	Develop or complement VRIN resources
		Dynamic alignment is the coevolution of IS and the business in complex, rapidly changing environments to support semi-coherent strategies by ensuring appropriate, changing substantive capabilities are available. It investigates the way in which IS affects the nature of organizational agility, and how it is related to Dynamic Capabilities.		
Dynamic alignment	Business	Semi-coherent business ← strategy	Coevolve with IS and the environment →	Business-based substantive capabilities
		↕	↕	↕
	IS	Semi-coherent IS Strategy ←	Coevolve with business and the → environment	IS based substantive capabilities

Figure 1. A Meta-model of Alignment

Alignment Meta-model for Practitioners

For practitioners, the alignment meta-model has the potential of providing an alignment "road map," as demonstrated in Figure 2 below. Using this road map, practitioners would first identify the type of alignment required in their organization before identifying the best means of achieving it.

If an IS manager works in an organization which makes strategic plans, translates those into activities, such as those in the value chain, shop, or network, and plans resourcing to support those activities, then s/he would seek positional alignment. This would include ensuring support for value chain activities and prioritizing investment in IS to support those activities that added the most value. It would also include optimizing organizational structures so that IS managers could contribute to business plans and were aware of the types of strategy being pursued by the organization. For example, Ward and Peppard [2002, p. 251] summarize the findings of Howard, Vigden, Powell, and Graves [2001]. In terms of the alignment meta-model, this case could be described as follows. A strategic analysis of the automotive industry shows increased customer power and industry competitiveness, due to globalization. The European automotive industry does not have aligned information systems: their systems are based around selling from existing stock, and, with the change to mass customization, these systems result in excess finished stock and overcapacity. Aligned planning for information systems identified the need for changes within the value chain: processes and supporting systems needed to be changed and aligned with each other so that vehicles could be built and delivered to customers with very short lead times.

In an organization which has a strategic advantage as a result of unique resource bundles that are Valuable, Rare, Inimitable, and Non-Substitutable (VRIN), an IS manager should seek Resource alignment. S/he would focus on
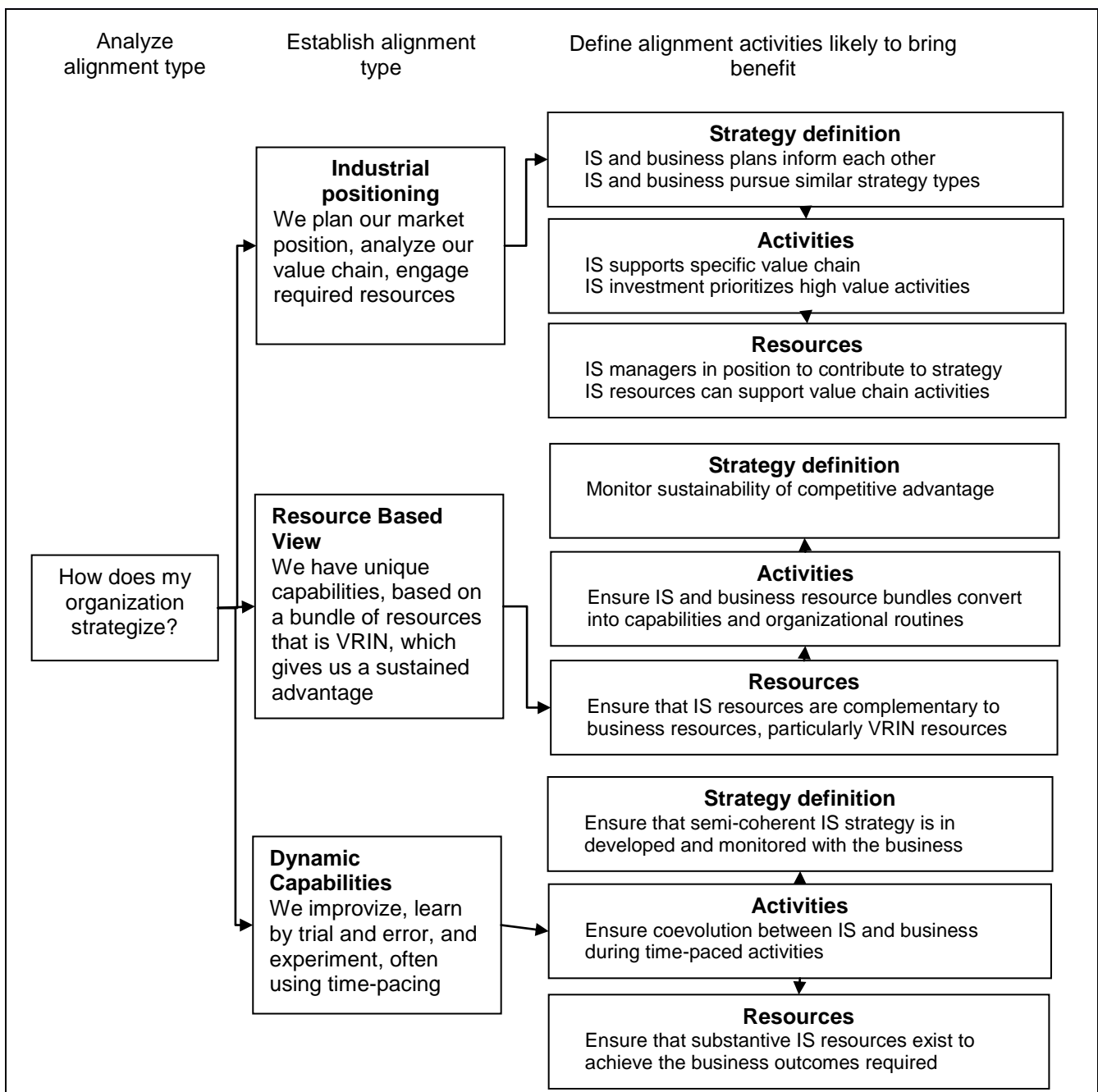
Analyze alignment type	Establish alignment type	Define alignment activities likely to bring benefit

Industrial positioning
We plan our market position, analyze our value chain, engage required resources

Strategy definition
IS and business plans inform each other
IS and business pursue similar strategy types

Activities
IS supports specific value chain
IS investment prioritizes high value activities

Resources
IS managers in position to contribute to strategy
IS resources can support value chain activities

How does my organization strategize?

Resource Based View
We have unique capabilities, based on a bundle of resources that is VRIN, which gives us a sustained advantage

Strategy definition
Monitor sustainability of competitive advantage

Activities
Ensure IS and business resource bundles convert into capabilities and organizational routines

Resources
Ensure that IS resources are complementary to business resources, particularly VRIN resources

Dynamic Capabilities
We improvize, learn by trial and error, and experiment, often using time-pacing

Strategy definition
Ensure that semi-coherent IS strategy is in developed and monitored with the business

Activities
Ensure coevolution between IS and business during time-paced activities

Resources
Ensure that substantive IS resources exist to achieve the business outcomes required

Figure 2. Alignment Roadmap

ensuring the complementarity of the IS resources, where possible ensuring that they were also VRIN. This complementarity should extend to incorporating combinations of IS and business resources into organizational routines. IS managers should also ensure that IS resources contribute to the sustainability of the competitive advantage that the organization enjoys. An example might be the information systems support at a university. The "customer" base at universities is complex—in many countries, funding comes from student fees, government grants tied to student numbers, grants from research funding bodies, and endowments. Universities are operating in an increasingly competitive, global environment where attracting students is crucial. However, the reasons why students choose a university are complex and include a broad range of resource mixes which vary from university to university. These include, for example, quality of teaching, university reputation and prestige, level of IT usage, and campus surroundings [Morgan, 2009]. It is critical that universities understand the resource mix that is attracting students and ensure that IS support aligns with this. For example, a university with a long tradition of small, face-to-face tutorials, which has developed a resource bundle, in terms of staff, accommodation, and traditions of debate, focused on this mode of delivery and on a specific student lifestyle implicit to it might be less likely to make large-scale investments in e-learning facilities than one which had developed significant skills over time in distance learning. Moreover, the type of e-learning facilities developed in each institution would be different in nature. The IS

manager needs to understand the complexities of the specific resource mix in the university in which s/he operates, and ensure that appropriate IS-based resources are developed.

In an organization that is constantly changing in response to rapid change in the environment, an IS manager should seek coevolution with the business by improvising, learning by trial-and-error, and experimentation. S/he should contribute to a debate on time-pacing activities, such as specifying the percentage of activities that will be supported by new IS. S/he should also contribute to semi-coherent strategies. Brown and Eisenhardt [1998] give the example of 3M (pp. 15–17). This company produces a range of products, often with little in common, such as reflective guardrails, sandpaper, masking tape, thinsulate, and Post-it notes. It survives through maintaining its dynamic capabilities. Techniques it uses to do so include allowing scientists to spend 15 percent of their time as they choose; accelerating funding for projects that will change the basis for competition for 3M, and setting a rhythm of change by demanding that 25 percent of sales must come from products which are less than four years old. Aligned information systems need to maintain agility to support a range of unknown future activities and yet provide structure in certain areas—for example, financial controls—where this is essential.

It is also possible that IS managers may find themselves using different parts of the alignment roadmap in different situations over the same time period. The example below shows how the CIO of a bookshop franchise might, in 2012, use all three types of alignment.

As background, assume that the bookshop franchise grew rapidly over the period 1970 to 1990, based on, in Porter's terms, a differentiated product—a larger range of books than could be found in other bookshelves; an enthusiastic, well-informed staff; and comfortable, spacious premises where browsing was encouraged. It also had a mail-order catalogue from which it sold directly to consumers.

In the mid-1990s, the bookshop launched Internet sales of (print) books. Its bricks and mortar sales were still significant, and the importance of a comfortable space for customers was reinforced with in-store coffee shops. Customer experience was also emphasized with reading clubs for children during school holidays and "meet the author" sessions. The concept of staff engagement was reinforced by recommendations from staff in each store, via handwritten critiques attached to the books themselves. The concept of a large range of books was enhanced by a highly efficient supply chain, meaning that, if a book was not available in store, it could be sourced and sent directly to the customer or brought into the bookstore within a short timeframe.

By the late 2000s, the bookshop had also established Internet sales of e-books and in 2010 launched its own e-reader. It enhanced the sense of physical community and of the knowledgeability of the organization by developing an online presence that included videos of discussions with authors based on in-store meetings, blogs, and its own review magazine.

Despite reasonably buoyant returns, the survival of the franchise depends, at best, on careful strategizing. It is possible that Internet sales of books and e-books will lead to the demise of its bricks and mortar outlets. It is also possible that the Internet market will be dominated by one supplier—Amazon.com.

How would the CIO, in 2012, work to ensure that IS was aligned with the business? The franchise was built on the knowledgeability of staff and its access to a wide range of books—something that depends on Valuable, Rare, Inimitable, and Non-Substitutable (VRIN) resources. The CIO needs to ensure that IS remains a part of this bundle of resources, using the Resource Based View part of the roadmap.

Information on the availability of books, both for online ordering and in stores, must be highly accurate. Customer attrition, for example, will almost certainly result if customers arrive at a store, having been informed on line or told over the phone that a book is available, and find that in fact it is not on the shelves. Hence, inventory management and other back office processes must be seamlessly supported by systems, with real-time updates as books are bought. Furthermore, the ordering of books from publishers must be speedy, so there must be highly efficient supply chains in place. The browsing experience needs to be enhanced by the availability and display of the books most appropriate and attractive to the demographic served by each bricks and mortar store. This means that sophisticated and effective business intelligence systems must be in place to inform each store of the range of books to offer.

Ensuring staff are enthusiastic and knowledgeable may require a range of management techniques, such as recruitment, training, possibly aligning staff specialist interests to particular books, etc. Each of these management techniques needs to be supported by solid HR processes and system. The information systems used in store need to support specific staff needs—ensuring the IS remains complementary to this use will require feedback loops from staff if, for example, they find systems too slow or information hard to find.

The Internet presence needs to emphasize the range of books, and the quality of information about them. It needs to be easy to use and have secure payment options. It needs to extend the notion of in-store advice by advising customers of other books they may enjoy, based on their prior purchases and any other demographic information—in other words, a sophisticated customer relationship management system is required. It needs to encourage customers to visit physical bookstores by making it easy to find out where they are, what they stock, and other information such as their opening hours.

In addition to the Resource Based View of alignment, the CIO may also have to consider aligning IS to the strategic position of the bookshop. A traditional five-forces analysis would, particularly, emphasize a growing threat of alternatives to print books, and the CIO will be likely to contribute to the discussion regarding new technologies, and their possible impacts on the viability of the bookstore franchise. S/he is likely to produce an IT/IS strategic plan, which defines and costs the technological infrastructure, and specific systems required, to support specific business strategies. S/he is also likely to produce scenarios regarding the development of specific new technologies (for example, an enhanced website), providing high-level business cases for each technology being considered.

The CIO would also have to consider dynamic capabilities. The bookselling industry has seen radical change over the past twenty years, and there is no reason to suppose it has now reached an equilibrium. Many of the alternatives to books and ways of supplying them are being developed by high-tech companies—Amazon with Amazon books and its e-reader (Kindle), and Apple with its iPad, for example. These companies thrive on an innovate culture and demonstrate strong dynamic capabilities. They regularly announce new products and services, many of which may revolutionize the book market further—or may, by contrast, fail to capture a new customer base. The bookshop needs to respond to, or possibly even lead, such changes. This means being able to change rapidly. Dynamic alignment will involve coevolving with the rapidly changing business, possibly using small-scale experimentation (for example, the launch of an e-reader in specific stores or a new use of social media aimed at a specific demographic). It will also require that IS resources, both human and technical, are agile enough to respond quickly to, and sometimes lead, unexpected change.

Alignment for Researchers

For researchers, the benefit of the meta-model is that it gives a pattern of current alignment studies and gives a systematic link with strategic theories. This allows the contribution that alignment makes to each strategic theory to be more consistently identified and also shows where alignment could be enhanced by theory. Taking each type of alignment in turn:

Positional Alignment

Positional alignment literature contributes to strategic theory based on industry position by identifying a series of business and information systems typologies that can be used to inform the strategic position taken by an organization.

By more systematically using theory, alignment studies could broaden the focus. Current studies of positional alignment have often, perhaps understandably focused on strategy. This article reinforces the assertion of Tallon [2007–8] that alignment at the level of value adding activities could also be studied.

Resource Alignment

There are three ways in which the alignment literature can contribute to current literature on the Resource Based View. First, by addressing the gap regarding complementary of resources identified by Wade and Hulland [2004] and Schwarz et al. [2010]. Second, by identifying patterns over time that could affect several organizations using stages of growth models, maturity models, and evolutionary models, which have a broad, sociotechnical perspective [McFarlan, 1971; Galliers, 1991a; Teo and King, 1999; Luftman, 2000], and, third, by identifying specific bundles of IS and business resource complementarities, including:

- Planning processes that integrate the IS and business plans as part of an ongoing, organizational activity, or routine, which involves knowledge sharing [King, 1978; Earl, 1993; Broadbent and Weill, 1993; King and Teo, 1997; Teo and King, 1996, 1997; Luftman, 2000]

- The relationship between IS and business personnel, including communication, level of partnership, social alignment, shared knowledge, shared perceptions, and shared vision [Broadbent and Weill, 1993; Reich and Benbasat, 2000; Kearns and Lederer, 2000, 2003; Luftman, 2000]

- IS resources embedded in causally ambiguous business processes which are hence inimitable to other organizations [Tallon, 2007–8]

- Organizational routines for IS governance and measurement of value [Luftman, 2000]

- Development of technology architecture embedded as a development process within other organizational processes [Broadbent and Weill, 1993; Luftman, 2000]

There are two ways in which Resource Based alignment models could be more closely associated with the Resource Based View. First, a systematic discussion of how alignment enables an organization to ensure that its resources remain Valuable, Rare, Inimitable, and Non-Substitutable is currently lacking in the literature. Second, introduction of more systematic theory into the way in which the resource bundle develops, in particular, introduction of the concepts of organizational learning and asset stock accumulation (see Piccoli and Ives, 2005).

Dynamic Alignment

Dynamic alignment is still a relatively new area of study. Early studies indicate the potential of exploring organizational agility [Tallon and Pinsonneault, 2011] as part of the dynamics of alignment. Dynamic Capabilities literature can also inform the study of alignment, as Schwarz et al. [2010] indicated.

Ways in which the alignment literature could contribute to that on Dynamic Capabilities include:

1. Comparison of the way in which alignment operates in industries with long periods of equilibrium, possibly punctuated by periods of rapid development [Sabherwal et al., 2001], with those that experience constant, rapid change [Eisenhardt and Martin, 2000; Peppard and Breu, 2003]

2. Further exploration of the notion of organizational agility [Tallon and Pinsonneault, 2011] and the way it is incorporated within alignment. Elsewhere in the literature, the time lag in producing IS resources, particularly IS infrastructure has been discussed [Piccoli and Ives, 2005]. The dynamics of alignment could incorporate this perspective.

Dynamic alignment studies could be more closely linked with dynamic capability theory by:

1. Linking it more clearly with theories of chaos and coevolution: specifically, how alignment occurs in the context of improvisation, trial-and-error learning, and experimentation, and how IS can contribute to time-paced change initiatives

2. Differentiating more explicitly between the alignment of substantive and dynamic capabilities

Contingent Alignment

Contingent alignment literature could contribute to the literature on the complementarity between strategic theories by providing a better understanding of the processes involved as a firm's resources develop, or as it maintains its ability to change dynamically, while maintaining an understanding of its industry position.

Contingent alignment literature could be more closely informed by the work of Spanos and Lioukas [2001], together with the discussion of ways, means, and ends [Ward and Daniel, 2006, p. 58, and Table 3 in this article]. This would allow a more systematic investigation of complementarity between strategic theories.

VII. LIMITATIONS OF THE STUDY

In order to effectively demonstrate the concept of categorizing alignment, previous alignment papers had to be analyzed in some detail. This has limited the number of papers being reviewed. As stated earlier, these papers form a subset of those in two recent reviews, together with alignment precursors, papers which have specifically demonstrated new directions for alignment, and papers published since the reviews. While this allows gaps in the literature to be indicated, a broader study would be required in any given alignment area before those gaps could be confirmed.

VIII. CONCLUSION

Divergence in the alignment literature has been addressed in this study by proposing a meta-model, using strategic theory as its basis, and providing definitions for different types of alignment. It has been shown to have potential benefit for practitioners by providing a roadmap through the currently complex and divergent field of alignment, to allow more focused prescriptions for action. It has also been shown to have potential for academics by providing a more systematic overview, allowing gaps in the literature to be identified, and also allowing future studies to take a more focused view of alignment. It also has the potential to help give alignment a better theoretical grounding, thus enhancing both alignment studies and studies of IS and strategy.

ACKNOWLEDGMENTS

REFERENCES

Amit, R. and P.J.H. Schoemaker (1993) "Strategic Assets and Organizational Rent", *Strategic Management Journal,* (14)1, pp. 33–46.

Avison, D., J. Jones, P. Powell, and D. Wilson (2004) "Using and Validating the Strategic Alignment Model", *Journal of Strategic Information Systems,* (13)3, pp. 223–246.

Ball, L. and R. Harris (1982) "SMIS Members: A Membership Analysis", *Management Information Systems Quarterly,* (6)1, pp. 19–38.

Barney, J.B. (1991) "Firm Resources and Sustained Competitive Advantage", *Journal of Management,* (17)1, pp. 99–120.

Benbya, H. and B. McKelvey (2006) "Using Coevolutionary and Complexity Theories to Improve IS Alignment: A Multi-level Approach", *Journal of Information Technology,* (21)4, pp. 284–298.

Bergeron, F., L. Raymond, and S. Rivard (2004) "Ideal Patterns of Strategic Alignment and Business Performance", *Information and Management,* (41)8, pp. 1003–1020.

Bharadwaj, A. (2000) "A Resource-Based Perspective on Information Technology and Firm Performance: An Empirical Investigation", *Management Information Systems Quarterly,* (24)1, pp. 169–196.

Brancheau, J.C., B.D. Janz, and J.C. Wetherbe (1996) "Key Issues in Information Systems Management 1994–95 SIM Delphi Results", *Management Information Systems Quarterly,* (20)2, pp. 225–242.

Brancheau, J.C. and J.C. Wetherbe (1987) "Key Issues in Information Systems Management", *Management Information Systems Quarterly,* (11)1, pp. 23–45.

Broadbent, M. and P. Weill (1993) "Improving Business and Information Strategy Alignment: Learning from the Banking Industry", *IBM Systems Journal,* (32)1, pp. 162–179.

Brown, S.L. and K.M. Eisenhardt (1997) "The Art of Continuous Change: Linking Complexity Theory and Time-based Evolution in Relentlessly Shifting Organizations", *Administrative Science Quarterly,* (42)1, pp. 1–34.

Brown, S.L. and K.M. Eisenhardt (1998) *Competing on the Edge: Strategy as Structured Chaos,* Boston, MA: Harvard Business School Press.

Burn, J.M. and C. Szeto (2000) "A Comparison of the Views of Business and IT Management on Success Factors in Strategic Alignment", *Information and Management,* (37)4, pp. 197–216.

Byrd, T.A., B.R. Lewis, and R.W. Bryan (2006) "The Leveraging Influence of Strategic Alignment on IT Investment: An Empirical Examination", *Information and Management,* (43)3, pp. 308–321.

Campbell, B., R. Kay, and D.E. Avison (2005) "Strategic Alignment: A Practitioner's Perspective", *Journal of Enterprise Information Systems Management,* (18)5/6, pp. 653–664.

Chan, Y.E. (1992) *Business Strategy, Information Systems Strategy, and Strategic Fit: Measurement and Performance Issues,* Ph.D. thesis no. 609, The University of Western Ontario, Faculty of Graduate Studies, London, Ontario.

Chan, Y.E. (2002) "Why Haven't We Mastered Alignment? The Importance of the Information Organization Structure", *Management Information Systems Quarterly Executive,* (1)2, pp. 97–112.

Chan, Y.E., Huff, S.L., Barclay, D.W., Copeland, D.G. (1997) "Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment", *Information Systems Research,* (8)2, pp. 125–150.

Chan, Y.E. and B.H. Reich (2007) "IT Alignment: An Annotated Bibliography", *Journal of Information Technology,* (22)4, pp. 316–396.

Chan, Y.E. and B.H. Reich (2007a) "IT Alignment: What Have We Learned", *Journal of Information Technology,* (22)4, pp. 297–315.

Chan, Y.E., R. Sabherwal, and J.B. Thatcher (2006) "Antecedents and Outcomes of Strategic IS Alignment: An Empirical Investigation", *IEEE Transactions on Engineering Management,* (51)3, pp. 27–47.

Day, G. (1994) "The Capabilities of Market-Driven Organizations", *Journal of Marketing,* (58)4, pp. 37–52.

De Leede, J., J.C. Looise, and B. Alders (2002) "Innovation, Improvement and Operations: An Exploration of the Management of Alignment", *International Journal of Technology Management,* (23)4, pp. 353–368.

Delery, J. and D.H. Doty (1996) "Modes of Theorizing in Strategic Human Resource Management: Tests of Universalistic, Contingency and Configurational Performance Predictors", *Academy of Management Journal,* (39)4, pp. 802–835.

Dickson, G.W. and M. Nechis (1984) "Key Information Systems Issues for the 1980's", *Management Information Systems Quarterly,* (8)3, pp. 135–139.

Earl, M.J. (1993) "Experiences in Strategic Information Systems Planning", *Management Information Systems Quarterly,* (17)1, pp. 1–24.

Earl, M.J. and D.F. Feeny (2000) "How to Be a CEO for the Information Age", *Sloan Management Review,* (41)2, pp. 11–23.

Eisenhardt, K.M. and S.L. Brown (1998) "Time Pacing: Competing in Markets That Won't Stand Still", *Harvard Business Review,* (76)2, pp. 59–69.

Eisenhardt, K.M. and J.A. Martin (2000) "Dynamic Capabilities: What Are They?" *Strategic Management Journal,* (21)10/11, pp. 1105–1121.

Galliers, R.D (1987) "Information Systems Planning in the United Kingdom and Australia—A Comparison of Current Practice", in Zorkorczy, P.I. (ed.) *Oxford Surveys in Information Technology,* Oxford, England: Oxford University Press.

Galliers, R.D. (1991a) "Strategic Information Systems Planning: Myths, Reality and Guidelines for Successful Implementation", *European Journal of Information Systems,* (1)1, pp. 55–64.

Galliers, R.D. (1991b) "Information Systems Management and Strategy Formulation: The 'Stages of Growth' Model Revisited", *Information Systems Journal,* (1)2, pp. 89–114.

Grant, R.M. (1991) "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation", *California Management Review,* (33)3, pp. 114–153.

Henderson, J.C., J.F. Rockart, and J.G. Sifonis (1987) "Integrating Management Support Systems into Strategic Information Systems Planning", *Journal of Management Information Systems,* (4)1, pp. 5–24.

Henderson, J.C. and M.E. Treacy (1986) "Managing End-User Computing for Competitive Advantage", *Sloan Management Review,* (27)2, pp. 3–14

Henderson, J. and N. Venkatraman (1993) "Strategic Alignment: Leveraging Information Technology for Transforming Organizations", *IBM Systems Journal,* (32)1, pp 4–16.

Henderson, J. and N. Venkatraman (1999) "Strategic Alignment: Leveraging Information Technology for Transforming Organizations: Reprint of 1993 Paper", *IBM Systems Journal,* (38)2 and 3, pp. 472–484.

Holland, C., G. Lockett, and I. Blackman (1992) "Planning for Electronic Data Interchange", *Strategic Management Journal,* (13)7, pp. 539–550.

Howard, M., R. Vigden, P. Powell, and A. Graves (2001) "Planning IS Related Industry Transformation: The Case of the 3DayCar", *Proceedings of the 9th European Conference on Information Systems,* Bled, Slovenia.

Irani, Z. (2002) "Information Systems Evaluation: Navigating Through the Problem Domain", *Information Management,* (40)1, pp. 11–24.

Ives, B. and G.P. Learmonth (1984) "The Information Systems as a Competitive Weapon", *Communications of the ACM,* (27)12, pp. 1193–1201

Kearns, G.S. and A.L. Lederer (2000) "The Effect of Strategic Alignment on the Use of IS-Based Resources for Competitive Advantage", *Journal of Strategic Information Systems,* (9)4, pp. 265–293.

Kearns, G.S. and A.L. Lederer (2003) "A Resource-Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage", *Decision Sciences,* (34)1, pp. 1–29.

King, W.R. (1978) "Strategic Planning for Information Systems", *MIS Quarterly,* (2)1, pp. 27–37.

King, W.R. and T.S.H. Teo (1997) "Integration Between Business Planning and Information Systems Planning: Validating a Stage Hypothesis", *Decision Sciences,* (28)2, pp. 279–308

Luftman, J. (ed.) (1996) *Competing in the Information Age: Strategic Alignment in Practice,* Oxford, England: Oxford University Press.

Luftman, J. (2000) "Assessing Business–IT Alignment Maturity" *Communications of the Association for Information Systems,* (4) Article 14, pp. 1–51.

Communications of the Association for Information Systems

Luftman, J. (2005) "Key Issues for IT Executives 2004", *Management Information Systems Quarterly Executive,* (4)2, pp. 269–285.

Luftman, J. (2006) "Key Issues for IT Executives 2005", *Management Information Systems Quarterly Executive,* (5)2, pp. 27–45.

Luftman, J. and T. Ben-Zvi (2011) "Key Issues for IT Executives: Cautious Optimism in Uncertain Economic Times", *Management Information Systems Quarterly Executive,* (10)4, pp. 203–212.

Luftman, J. and T. Brier (1999) "Achieving and Sustaining Business-IT Alignment", *California Management Review,* (42)1, pp. 109–122.

Luftman, J. and R. Kempaiah (2007) "An Update on Business-IT Alignment: 'A Line' Has Been Drawn", *Management Information Systems Quarterly Executive,* (6)3, pp. 165–177.

Luftman, J. and R. Kempaiah (2008) "Key Issues for IT Executives 2007", *Management Information Systems Quarterly Executive,* (3)2, pp. 89–104.

Luftman, J. and E.R. McLean (2004) "Key Issues for IT Executives", *Management Information Systems Quarterly Executive,* (3)2, pp. 89–104.

Mata, F.J., W. Fuerst, and J.B. Barney (1995) "Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis", *Management Information Systems Quarterly,* (19)4, pp. 487–505.

McFarlan, F.W. (1971) "Problems in Planning the Information System", *Harvard Business Review,* (49)2, pp. 75–89.

McFarlan, F.W. (1984) "Information Technology Changes the Way You Compete", *Harvard Business Review,* (62)3, pp. 98–103.

McKelvey, B. (1997) "Quasi-Natural Organization Science", *Organization Science,* (2)1, pp. 71–87.

McKelvey, B. (2004) "1st Principles of Efficacious Adaptation", *Working Paper,* UCLA Anderson School of Management, Los Angeles, CA.

McLean, E.R. and J.V. Soden (1977) *Strategic Planning for MIS,* Hoboken, NJ: Wiley-Interscience.

Miles, R.E. and C.C. Snow (1978) *Organizational Strategy, Structure, Process,* New York, NY: McGraw-Hill.

Miller, D. (1992) "Environmental Fit Versus Internal Fit", *Organization Science,* (3)2, pp. 159–178.

Morgan, R. (2009) *Year 12 Student Choices,* Australian Government: Department of Education, Canberra.

Nevo, S. and M. Wade (2010) "The Formation and Value of IT-enabled Resources: Antecedents and Consequences of Synergistic Relationships", *Management Information Systems Quarterly,* (34)1, pp. 163–183.

Niederman, F. and J.C. Brancheau (1991) "Information System Management Issues for the 1990s", *Management Information Systems Quarterly,* (15)4, pp. 475–500.

Nolan, R.L. (1973) "Managing the Computer Resource: A Stage Hypothesis", *Communications of the ACM,* (16)7, pp 399–405.

Palmer, J.W. and M.L. Markus (2000) "The Performance Impacts of Quick Response and Strategic Alignment in Specialty Retailing", *Information Systems Research,* (11)3, pp. 241–259.

Parsons, G.L. (1983) "Information Technology: A New Competitive Weapon", *Sloan Management Review,* (25)1, pp. 3–14.

Peppard, J. and K. Breu (2003) "Beyond Alignment: A Coevolutionary View of the Information Systems Strategy Process", *Twenty-fourth International Conference on Information Systems,* Seattle, WA.

Piccoli, G. and B. Ives (2005) "Review: IT-dependent Strategic Initiatives and Sustained Competitive Advantage: A Review and Synthesis of the Literature", *Management Information Systems Quarterly,* (29)4, pp. 747–776.

Porter, M.E. (1979) "How Competitive Forces Shape Strategy", *Harvard Business Review,* (57)2, pp. 137–145.

Porter, M.E. (1980) *Competitive Advantage,* New York, NY: Free Press.

Porter, M.E. (1985, 1998) *Competitive Advantage: Creating and Sustaining Superior Performance* (with 1998 introduction)*,* New York, NY: Free Press.

Porter, M.E. (2001) "Strategy and the Internet", *Harvard Business Review,* (79)3, pp. 62–78.

Porter, M.E. and V.E. Millar (1985) "How Information Gives You a Competitive Advantage", *Harvard Business Review,* (63)4, pp. 149–160.

Preston, D. and E. Karahanna (2009) "How to Develop a Shared Vision: The Key to IS Strategic Alignment", *MIS Quarterly Executive,* (8)1, pp. 1–8.

Reich, B.H. and I. Benbasat (1996) "Measuring the Linkage Between Business and Information Technology Objectives", *Management Information Systems Quarterly,* (20)1, pp. 55–81.

Reich, B.H. and I. Benbasat (2000) "Factors That Influence the Social Dimension of Alignment Between Business and Information Technology Objectives", *Management Information Systems Quarterly,* (24)1, pp. 81–113.

Rivard, S., L. Raymond, and D. Verreault (2006) "Resource-based View and Competitive Strategy: An Integrated Model of the Contribution of Information Technology to Firm Performance", *Journal of Strategic Information Systems,* (15)1, pp. 29–50.

Rockart, J.F. (1979) "Chief Executives Define Their Own Data Needs", *Harvard Business Review,* (57)2, pp. 81–93.

Sabherwal, R. and Y.E. Chan (2001) "Alignment Between Business and IS Strategies: A Study of Prospectors, Analysers and Defenders", *Information Systems Research,* (12)1, pp. 11–33.

Sabherwal, R., R. Hirschhiem, and T. Goles (2001) "The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model", *Organization Science,* (12)2, pp. 179–197.

Schwarz, A., M. Kalika, H. Kefi, and C. Schwarz (2010) "A Dynamic Capabilities Approach to Understanding the Impact of IT-Enabled Business Processes and IT-Business Alignment on the Strategic and Operational Performance of the Firm", *Communications of the Association for Information Systems,* (26) Article 4, pp. 57–84.

Scott-Morton, M.S. (1991) *The Corporation of the 1990s: Information Technology and Organizational Transformation,* Oxford, England: Oxford University Press.

Sen, A. and A.P. Sinha (2011) "IT Alignment Strategies for Customer Relationship Management", *Decision Support Systems,* (51)3, pp. 609–619.

Spanos, Y.E. and S. Lioukas (2001) "An Examination of the Causal Logic of Rent Generation: Contrasting Porter's Competitive Strategy Framework and the Resource-Based Perspective", *Strategic Management Journal,* (22)10, pp. 908–934.

Sullivan, C.H.J. (1985) "Systems Planning in the Information Age", *Sloan Management Review,* (26)2, pp. 3–12.

Tallon, P.P. (2007–8) "A Process-Oriented Perspective on the Alignment of Information Technology and Business Strategy", *Journal of Management Information Systems,* (24)3, pp. 227–268.

Tallon, P.P., K. Kraemer. and V. Gurbaxani (2000) "Executive Perceptions of the Contribution of Information Technology to Firm Performance: A Process-Oriented Approach", *Journal of Management Information Systems,* (16)4, pp. 137–165.

Tallon, P.P. and A. Pinsonneault (2011) "Competing Perspectives on the Link Between Strategic Information Technology Alignment and Organizational Agility: Insights from a Mediation Model", *Management Information Systems Quarterly,* 35(2), pp. 463–486.

Teece, D.J., G. Pisano, and A. Shuen (1997) "Dynamic Capabilities and Strategic Management", *Strategic Management Journal,* (18)7, pp. 509–533.

Teo, T.S.H. (2009) "Aligning Business and Information Systems: Review and Future Research Directions", in King, W.R. (ed.) *Advances in Management Information Systems*, Armonk, NY: M.E. Sharpe.

Teo, T.S.H. and W.R. King (1996) "Assessing the Impact of Integrating Business Planning and IS Planning", *Information and Management,* (30)6, pp. 309–321.

Teo, T.S.H. and W.R. King (1997) "Integration Between Business Planning and Information Systems Planning: An Evolutionary-contingency Perspective", *Journal of Management Information Systems,* (14)1, pp. 185–214.

Teo, T.S.H. and W.R. King (1999) "An Empirical Study of the Impacts of Integrating Business Planning and Information Systems Planning", *European Journal of Information Systems,* (8)3, pp. 200–210.

Treacy, M. and F. Wiersema (1995) *The Discipline of Market Leaders,* New York, NY: Basic Books.

vom Brocke, J., A. Simons, B. Niehaves, K. Riemer, R. Plattfaut, A. Cleven (2009) "Reconstructing the Giant: The Importance of Documentation Rigour in the Literature Search Process", *European Conference on Information Systems,* Verona, Italy.
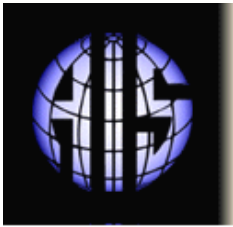
Wade, M. and J. Hulland (2004) "Review: The Resource-Based View and Information Systems Research: Review, Extension and Suggestions for Future Research", *Management Information Systems Quarterly,* (28)1, pp. 107–142.

Ward, J. and E. Daniels (2006) *Benefits Management: Delivering Value from IS and IT Investments,* Hoboken, NJ: Wiley.

Ward, J. and J. Peppard (2002) *Strategic Planning for Information Systems,* Hoboken, NJ: Wiley.

Webster, J. and R.T. Watson (2002) "Analyzing the Past to Prepare for the Future: Writing a Literature Review", *Management Information Systems Quarterly,* (26)2, pp. xiii–xxiii.

Weiss, J.W., A. Thorogood, and K.D. Clark (2006) "Three IT–Business Alignment Profiles: Technical Resource, Business Enabler and Strategic Weapon", *Communications of the Association for Information Systems,* (18) Article 10, pp. 676–691.

Wilson, T.D. (1989) "The Implementation of Information Systems Strategies in UK Companies: Aims and Barriers to Success", *International Journal of Information Management,* (9)4, pp. 245–258.

Zahra, S.A., H.J. Sapienza, and P. Davidsson (2006) "Entrepreneurship and Dynamic Capabilities: A Review, Model and Research", Agenda *Journal of Management Studies,* (43)4, pp. 917–955.

ABOUT THE AUTHORS

Jenny Leonard is a lecturer at the University of Sydney Business School, Australia. She has fifteen years experience as a senior manager in information systems, leading both project and operational teams. She is currently researching University Enterprise Systems and identifying the specific alignment issues in this area.

Peter B. Seddon is a Professor in the Department of Computing and Information Systems at the University of Melbourne, Australia. His teaching and research focus on helping people and organizations gain greater benefits from their use of information technology. His major publications have been in the areas of evaluating information systems success, packaged enterprise application software, IT outsourcing, IT management, and accounting information systems. His primary research area today is in the issues facing IT management.

Communications of the Association for Information Systems