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# Using and validating the strategic alignment model

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**Abstract**

The literature suggests that firms cannot be competitive if their business and information technology strategies are not aligned. Yet achieving strategic alignment continues to be a major concern for business executives. A number of alignment models have been offered in the literature, primary among them the strategic alignment model (SAM). However, there is little published research that attempts to validate SAM or describe its use in practice. This paper reports on the use of SAM in a financial services firm. Data from completed projects are applied to the model to determine whether SAM is useful as a management tool to create, assess and sustain strategic alignment between information technology and the business. The paper demonstrates that SAM has conceptual and practical value. The paper also proposes a practical framework that allows management, particularly technology management, to determine current alignment levels and to monitor and change future alignment as required. Through the use of this framework, alignment is more likely to be achieved in practice.


*Keywords:* Strategic alignment; Strategic alignment model; Alignment framework; Alignment in practice

## 1. Introduction

The literature suggests that firms cannot be competitive or successful if their business and information technology (IT)/information systems (IS) strategies are not aligned.

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Strategic alignment positively influences IT effectiveness (Porter, 1987; Galliers, 1991; Ciborra, 1997), leading to greater business profitability (Luftman et al., 1996). Conversely, it is argued that failure to leverage IT may seriously hamper a firm's performance and viability (Weill and Broadbent, 1998; Venkatraman, 2000).

The importance of strategic alignment has been stated frequently (Earl, 1996; Labovitz and Rosansky, 1997; Corrall, 2000), indeed, Galliers and Newell (2003) call it a central tenet of much of the theory and practice of IS strategy. It is a key concern for business executives (Luftman et al., 1996) and is ranked among the most important issues faced by IT executives (Papp, 2001; Tallon and Kraemer, 2003; Trainor, 2003). This importance is reinforced by numerous industry surveys that reveal executives' perceptions of alignment (Fitzharris, 1999; Head, 2000; Kennedy, 2000; Leigh, 2000; Weil, 2001). In Luftman et al.'s (1996) survey of 500 US executives from 300 organisations, about half believed their organisations to be aligned.

However, despite the widespread acceptance that business and IT strategies should be aligned, the nature of alignment is inadequately clarified in the literature:

> The concept of linkage has been historically invoked as a metaphor to argue for the integration of business and information technology strategies without adequate articulation or clarification of its characteristics (Henderson and Venkatraman, 1989).

Although Luftman (1996), Yetton (1997), Hsaio and Ormerod (1998) and Burn (1997) provide some examples of enablers and inhibitors of alignment, the literature provides little guidance on how to achieve alignment between business and IT strategies; the impacts misalignment might have on a firm; and what management can do to diagnose, achieve and maintain alignment (Luftman et al., 1996; Papp and Motiwalla, 1996).

This paper first reviews the debate on alignment in Section 2 and argues for using the SAM model of strategic alignment. We discuss SAM, along with its extensions in Section 3 and then investigate its use in a financial services firm in Section 4. Here, data from a set of completed projects are applied to the model and this research suggests that the model has value as a management tool to assess, create and sustain strategic alignment between IT/IS and the business. The paper concludes by proposing a practical model that allows technology management to determine current alignment and to help monitor and alter future alignment as required.

## 2. Strategic alignment—the debate

In contrast to some other areas of IS research, there is debate in the literature about what alignment actually is, why it is needed, how firms may go about the task of becoming aligned, and how it should best be researched. While there is little agreement on conceptualising alignment and its research basis, the literature does regularly lament the paucity of studies that assess how organisations carry out alignment in practice, an issue that is addressed later in this paper. This section reviews existing research and places our contribution within the dimensions of that research.

Strategic alignment has many pseudonyms. It is also termed *fit* (Porter, 1996), *integration* (Weill and Broadbent, 1998), *bridge* (Ciborra, 1997), *harmony* (Luftman et al.,

1996), *fusion* (Smaczny, 2001) and *linkage* (Henderson and Venkatraman, 1989). However, in all cases, it concerns the integration of strategies relating to the business and its IT/IS.

There are those who argue that IS alignment is not an issue in its own right. Some researchers, for example, Smaczny (2001), assert that as IS is pervasive in business, it should not be regarded as separable from business strategy, and therefore the need for alignment does not arise. Smaczny uses the term *fusion* to describe this integration. Yet, strategy in its broadest sense is all about alignment or matching organisational resources (including IS) with environmental threats and opportunities (Andrews, 1980). Indeed, IT management can be conceptualised as a problem of aligning the relationships between the business and IT infrastructure domain (Reich and Benbasat, 1996) in order to take advantage of IT opportunities and capabilities (Sambarmarthy and Zmud, 1992).

Alignment is seen to assist a firm in three ways: by maximising return on IT investment, by helping to achieve competitive advantage through IS, and by providing direction and flexibility to react to new opportunities. However, the apparent gap between the decision to invest in IT and the realisation of benefits (Weill and Broadbent, 1998) highlights the risk of using IT to initiate new strategies and transform business. Co-operation between the business and the IT department to maximise investment in technology is vital, and with this in mind, IT investments and business objectives have to be considered together. Yet, few senior management career paths include responsibility for IT (Weill and Broadbent, 1998) and technology is typically treated as a cost centre or viewed as an expense rather than an enabler of business value (Venkatraman, 1997; Avison et al., 1999a; Papp, 2001).

Although Jarvenpaa and Ives (1994) argue that too tight a fit between IS and business strategy may reduce strategic flexibility, alignment is usually viewed as beneficial as the following shows. Lederer and Mendelow (1989), for example, suggest that alignment increases the likelihood of developing systems more critical to the organisation and of obtaining top management support for IS. As IT's role in corporate strategy development increases, the application and analysis of alignment will facilitate a more competitive and profitable organisation (Galliers, 1991; Porter, 1987). Economic performance may be enhanced by alignment, by finding the right fit between external positioning and internal arrangements (Ciborra, 1997). By concentrating on the alignment of strategy and infrastructure, firms may not only achieve synergy and facilitate the development of business plans, but also increase profitability and efficiency. These tangible benefits allow management to focus on the application of IT as a means to leverage their core competencies, skills and technology scope, resulting in improved efficiency (Papp, 2001; Luftman et al., 1996).

Having argued that alignment is desirable, a second issue relates to how firms may become aligned. This is discussed next. The first concern regarding the practice of alignment is whether strategy or strategising is an appropriate way for firms to attain alignment. Weill and Broadbent (1998) support this view by arguing that by understanding and leveraging the business–IT partnership, an organisation can concentrate on the application of IT to enable the business strategy.

Critics of strategic planning and alignment maintain that the implicit dominance of a structured strategy process is questionable in an era where uncertainty and flexibility

predominate and the articulation of the strategic intent is difficult (Ciborra, 1997). Real life and real strategising is 'messy' and human thinking and actions rarely follow strict modular concepts (McKay and Marshall, 1999; Avison et al., 1999a,b). Strategic alignment also presumes that management is in full control and that information infrastructure can deliberately be aligned with emerging management insights (Maes, 1999; Ciborra, 1997; Galliers and Newell, 2003). Hence some argue that strategic alignment is illusory, even inexpedient (Maes, 1999).

The application of concepts such as strategic fit between resources and opportunities; generic strategies of low cost versus differentiation versus focus; and the strategic hierarchy of goals, strategies and tactics may make the strategic process rigid. This has a negative rather than a positive impact on an organisation when followed specifically and pedantically (Hamel and Prahalad, 1990). Strategic planning can distort creative thinking and misguide organisations that embrace it unreservedly (Mintzburg, 1987).

Reich and Benbasat (1996) see IS planning as but one mechanism to achieve linkage. The intellectual dimensions of linkage require that business and IT plans are internally consistent with mission, and that they are externally valid, i.e. comprehensive and balanced to external business and IT environments. They discuss the conceptualisation of linkages and how they might be measured by understanding current objectives, congruence in IT vision and self-reporting.

A further debate concerns the measurement of alignment. Ciborra (1997) argues that management, through knowledge and understanding of alignment, can classify their strategy in terms of boxes and linear relationships, but back in the real world, they have difficulty in measuring those relationships or formulating processes to apply the alignment maps in practice. Measures that align everyone within the organisation, with the intentions of the business and with the key goals of their respective departments, are needed to achieve strategic alignment, but there are no indicators as to what these measures might be (Labovitz and Rosansky, 1997; Galliers, 1991).

There is also disagreement as to whether strategic alignment should be viewed as an outcome or as a dynamic process. The former view was dominant (Weill and Broadbent, 1998; Porter and Millar, 1985; Earl, 1989) and consequently the need to maintain alignment dynamically was rarely acknowledged. However more recent research argues for dynamic alignment (Labovitz and Rosansky, 1997; Venkatraman, 2000; Ciborra, 1997).

Smaczny (2001) claims that no studies focus on how organisations actually achieve alignment (though clearly there are some organisations that attempt this) nor, indeed, whether alignment is the right way of looking at the issue. Most models of alignment assume that organisations are built on mechanistic principles and that management uses structured, planning-oriented approaches to business objectives. In such firms alignment may work, but not in others.

The early work on strategic processes essentially viewed firms as homogeneous. More recent research, especially with the increasing interest in competencies and capabilities, recognises that firms have different resources and are differently able to marshal these. Tallon et al. (2000) suggest that as strategic alignment is one of the most important issues facing business and IS executives, focussed firms will achieve more alignment and that differently focussed firms will use different techniques for their IT evaluation. The authors examine executives' perceptions of the business value of IT. They identify a number of

firm types. In unfocussed firms there are no clear goals for IT and executives are indifferent to it. IT is viewed as an expense, so management delays IT purchases and then mismanages or under-manages the IT investments they do make. In operations-focussed firms, the goals concern the operational effectiveness of IT. These goals involve reducing operating costs and increasing efficiency. In market-focussed firms, IT is used to enhance strategic positioning by creating or improving value propositions for customers. Finally, dual-focussed firms improve operational effectiveness and strategic positioning simultaneously by market reach and new market creation. Empirically, the authors assess strategic alignment using a single item—extent to which IT strategy supports business strategy. The results suggest that executives in dual-focussed firms perceived the highest level of IT business value, followed by those in market-focussed firms, those in operations-focussed firms, and finally by unfocussed firm executives. Executives with more focussed goals for IT perceive higher levels of alignment, and higher levels of strategic alignment are associated with higher perceived levels of IT business value.

Using the Miles and Snow firm typology rather than firm-focus, Sabherwal and Chan (2001) show that alignment improves business performance and business success. Prospectors should develop and use market IS and strategic decision support systems. Systems imitation is less useful, unless strategies are similar and the significance of association between alignment and business success depends on business strategy. There is significant correlation between alignment and performance for prospectors and analysers but not for defenders. This suggests that senior managers in defenders should not argue strongly for alignment. However, Sabherwal and Chan (2001, p. 27) conclude that 'The processes by which alignment is accomplished (i.e. practically and effectively worked out) in organisations need to be better understood'.

Concurrently, Hirschheim and Sabherwal (2001) assess whether firms that follow the Miles and Snow typology suffer differentially from problems in achieving alignment. They identify three problematic trajectories in seeking alignment: paradoxical decisions, excessive transformations and uncertain turnarounds. Defenders are thought to have a 'utility' profile for IS use, achieved through low cost delivery, often outsourced. Analysers will seek alliances, perhaps by strategic sourcing. Lastly, prospectors have an infusion profile involving alignment through business leadership. Here IS is insourced and decentralised. Problematic alignment trajectories are explained by organisational inertia often due to sequential attention to goals, knowledge gaps, split executive responsibilities and underestimation of the extent of problems. The authors suggest that knowledge and process integration, planning processes involving multiple perspectives and transitional figures or powerful external forces may be employed to aid strategic IS alignment efforts.

Understanding processes lead to consideration of what may enable or inhibit alignment (Luftman et al., 1996). The enablers include executive support for IT, starting development in tandem, leadership from the IT department that the IT department prioritises workload well and that the firms' resources are shared. In contrast, the inhibitors are that the IT department prioritises workload poorly, there is no close relationship between the IT department and the business, the IT department does not know its customers and it does not meet its commitments, resulting in little executive support for IT.

Papp (1999) concurs that alignment is the key to achieving improved profitability from IT. For him, alignment considers strategic fit between strategy and infrastructure, and

fundamental integration between business and IT. He identifies 12 perspectives on alignment in the literature, of which fusion is common. This is one of the few papers to offer managers a method by which they may assess or achieve alignment. This involves assessing the firm's perspectives using the alignment model, learning to recognise and leverage IT to maximum efficiency, incorporating financial measurements suitable for the particular industry, giving everyone a role to facilitate synergy between IT and the business, and finally, continuous review of alignment and assessment. However, while these may be sensible steps to take, this is somewhat general in nature and there is insufficiency here for a manager to use in practice.

In analysing alignment in small firms, Hussain et al. (2002) concur that alignment is used to mean a variety of things. Different researchers have focussed on different parts of the Henderson and Venkatraman (1989) model, either the process or the content. These include linking mechanisms to achieve alignment with a social element (who is involved) and an intellectual element (methods and techniques). Reviewing various attempts to measure fit (Atkins, 1994; Lefebvre et al., 1992; Chan et al., 1997; Luftman et al., 1999; Reich and Benbasat, 2000), the authors suggest that there is little consensus on the factors involved. Their results show that aligned firms have greater IT maturity, CEO knowledge of software is greater in aligned firms and that there is no support for a relationship between external IT expertise and IT alignment. Hussain et al. conclude that there remains a 'need for research into processes associated with alignment' (p. 119). In a companion paper, Cragg et al. (2002) suggest that many small manufacturers had achieved a high degree of alignment between business strategy and IT, 'but we don't know how this was achieved' (p. 122). The highly aligned firms perceive greater impacts from IT.

Luftman (1996), Luftman (1997) and Papp (2001) do provide some practical application of strategic alignment (for example, where to start and how to continue the alignment process), yet fail to test the theories and methods in a practical manner in real life situations and organisations (Avison et al., 1999a,b). Most firms of any size have had strategic plans for many years and their increasing linkage with business strategy should have resulted in some form of alignment. However, this is not clearly the case, and this suggests that a problem still exists. Perhaps, there is a need for a clearer framework, despite models being available (Henderson and Venkatraman, 1989; Ciborra, 1997).

This section has demonstrated that there is a lack of agreement in the literature as to how firms do and should align. Part of this lack concerns a focus on theoretical rather than empirical studies, but other aspects point to disagreement as to how alignment is best researched. We now investigate this aspect.

Although alignment is a top management concern, no comprehensive model of the construct is commonly used. Reich and Benbasat (2000) contend that strategic alignment may be approached from a process or outcome perspective. Process research involves investigating planning activities, while outcome research involves realised strategies. Research of these two types would either examine strategies, structures and planning methods, or would focus on actors, values, communication and understanding. They suggest that there are two dimensions to strategy creation; an intellectual dimension that investigates the content of plans and planning approaches, and a social one looking at the people involved in the creation of alignment. As alignment is the degree to which the IT mission, objectives and plans support and are supported by the business mission,

objectives and plans, it is a state or outcome and its determinants are processes. Reich and Benbasat claim that the social dimension is less researched and which research treats strategy as a rational process. In any planning process, the involvement of top management is important as it improves the quality of IT, the progressive use of IT, rational innovation and IT effectiveness.

Regarding process, Das et al. (1991) identify five dimensions. *Formality* is about structure in the planning process, while *scope* assesses its comprehensiveness. *Participation* requires the involvement of managers, and *influences* are about the power of stakeholders. Finally, *co-ordination* investigates planning process corrections. In contrast, outcome research focuses on realised rather than planned or intended strategies.

Reich and Benbasat (2000) show that five elements contribute to short-term alignment. These are shared domain knowledge between the IT department and the business domain, IT implementation success, communications, planning connections between IT and the business, and business direction. In the longer term, there is little support for their model, only shared domain knowledge unambiguously distinguishes high from low achievers, though long-term business direction is also important.

There is an issue regarding the unit of analysis in alignment research. This concerns whether projects, firms or processes are the appropriate item to study. For example, Tallon and Kraemer (2003) examine alignment at a process rather than the firm level, employing, as a surrogate for alignment, cross-referencing in plans. They comment that some studies use executive perceptions of IT payoffs to try to understand the link between strategic alignment and IT business value. This approach has some support from Venkatramen and Ramanjam (1987) who find correlations between executives' perceptions and reality. Tallon and Kraemer introduce the notion of IT shortfall (where IT fails to support the business strategy) and IT under-utilisation (where business strategy fails to use IT). Their results show that alignment is highest in production, operations and customer relations, and lowest in sales and marketing. They further suggest that strategic alignment may lead to greater payoffs from IT, but that the relationship is only valid up to a certain critical level of alignment. However, Reich and Benbasat (1996) dismiss the use of written reports in alignment research, as they claim that reports are not used and can easily become out of date.

Finally, most alignment research treats alignment as a static end state rather than a moving target. Sabherwal et al. (2001) investigate how alignment evolves over time using a punctuated equilibrium model, i.e. long periods of stability followed by short periods of revolutionary change. If this sort of model applies, then static contingent models are unlikely to be appropriate. A punctuated equilibrium model suggests that even after alignment is achieved, environmental changes can reduce alignment due to over-emphasis, complacency and inertia, engendering a need for revolutionary change. Their results demonstrate that some firms had low alignment or misalignment even during evolutionary periods. Additionally, all the revolutions required some combination of five strong triggers—environmental shifts, sustained low performance, influential outsiders, strong leadership and perceptual transformation. The conclusions are that resolution by redesign is used but does not often work, although revolutions sometimes go too far. To address this, the IS strategic management profile should include business and IS strategy and structure.

This discussion has shown that there is a clear need for further research into alignment, especially the practicalities of its achievement. Having provided an overview of alignment, drawing attention to gaps in the research, this paper now discusses the chosen model of alignment and how it was researched in one organisation. This will enable us to demonstrate a practical framework to determine current alignment levels in firms and to monitor and change future alignment as required. Through the use of this framework, alignment is more likely to be achieved in practice.

## 3. Strategic alignment model (SAM) and extensions

### *3.1. Strategic alignment model*

A number of models of strategic alignment have been proposed. The two key ones that have attracted most attention from researchers are the MIT90s model (Scott Morton, 1991) and the SAM (Henderson and Venkatraman, 1989). The latter is employed here as:

> In comparison to the elements of the MIT90s framework, SAM draws a distinction between the external perspective of IT (IT strategy) and the internal focus of IT (IT infrastructure and process). This recognises the potential of IT to both support and shape business policy. It also elevates IT strategy from the traditional role of IT as solely an internal support mechanism (Henderson and Venkatraman, 1989).

This distinction implies two levels of integration: strategic integration between IT and the business strategy, which establishes the capability of IT at a strategic level, and operational integration, the link between IT infrastructure and process and organisational internal infrastructure and processes.

The SAM has been the basis for much of the strategic IT research. In our research, the model is used to discuss components of strategy and structure in an organisation and the factors to consider in assessing alignment.

The model (Fig. 1) is defined in terms of four domains of strategic choice: business strategy, IT strategy, organisation infrastructure and processes, and IT infrastructure and processes. Each has its constituent components: scope, competencies and governance at the external level; and infrastructure, skills and process at the internal level. The model is conceptualised in terms of two fundamental characteristics of strategic management: strategic fit (the interrelationships between external and internal domains) and functional integration (integration between business and technology domains).

Henderson and Venkatraman (1989) incorporate cross-domain perspectives, arguing that neither strategic nor functional integration alone is sufficient to align an organisation effectively. The multi-variate co-alignment (alignment perspective) addresses functional and strategic integration. The linkage between strategy and infrastructure and processes is examined in terms of process, structure and people, rather than at an abstract level of attempting to relate internal architectures to strategic goals. Multi-variate cross-domain perspectives work on the premise that strategic alignment at an organisational level can only occur when three of the four corporate domains are in alignment. The underlying

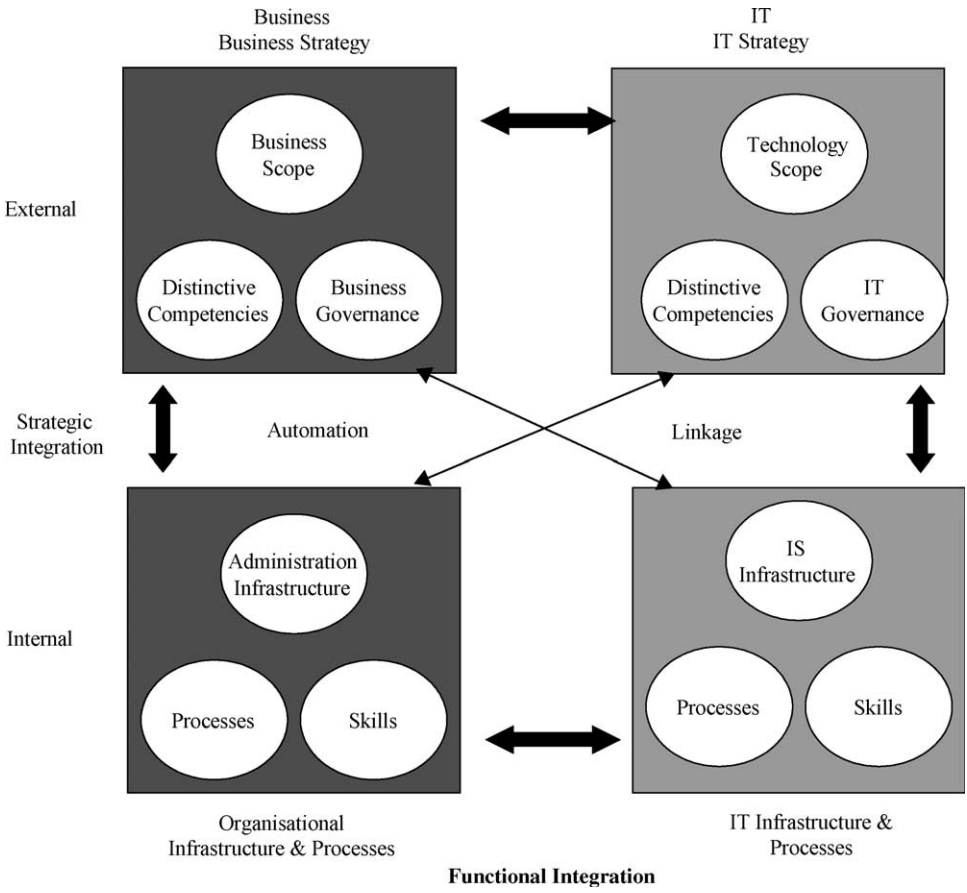


Fig. 1. Strategic alignment (adapted from Henderson and Venkatraman, 1989).

premise is that change cannot happen in one domain without impacting on at least two of the remaining three domains in some way.

An organisation's *alignment perspective* can be derived by drawing a line through the three dominant domain types, anchor domain, pivot domain and impacted domain:

*Anchor domain*: this is the strongest domain. It may have the strongest representation at executive level or be the core business area. It will generally be the initiator of change and provide the majority of requests for IT resources.

*Pivot domain*: this domain indicates which functional or strategic domain will ultimately be affected by the change initiated within the anchor domain. Luftman et al. (1996) identify this as the weakest domain.

*Impacted domain*: this domain is impacted the greatest by the change initiated in the anchor domain. Luftman et al. (1995) and Henderson and Venkatraman (1989) contradict each other in the interpretation of perspectives, and confuse the identification of the impacted domain. Henderson and Venkatraman (1989) identify the horizontal direction of the perspective as the impacted domain and the vertical direction of the perspective as

having implications for that domain, independent of which comes first, second or third. Luftman et al. (1995) identify the second domain as the weakest domain and the third domain as the impacted domain, in all cases. In Luftman et al., the strongest domain and the weakest domain are always adjacent to each other but this cannot hold true if the two domains are in opposite quadrants.

Henderson and Venkatraman provide a definition of each alignment perspective and an example for each that can be applied within a firm. Although the examples given are somewhat dated, they still enable understanding of the meaning of each perspective. The direction of the perspective runs from the anchor domain to the impacted domain, via the pivot domain. Perspectives are either 'top down' strategy driven or 'bottom up' process driven.

### *3.2. Extensions to the strategic alignment model*

Two key strains of research have emerged that follow on from the initial model. First, Luftman et al. (1996) define and review the original model in a more practical way though they do not enhance the model itself. Focusing on the concept of alignment perspectives, they expand the research to identify enablers and inhibitors to alignment within organisations. Their research confirms that the major enablers and/or inhibitors to alignment relate to communication and support between business and technology management. They also confirm the importance of including IT management in the strategic planning process. Second, Maes (1999) and Maes et al. (2000) enhance the SAM, producing the *unified framework* that incorporates additional functional and strategic layers into the model to reflect the current need for information and communication.

The unified framework is a generic framework for investigating and interrelating the different components of information management, and deals with the interrelationships of business, information, communication and technology at the strategic, structural and operations levels. This framework is the first real attempt to refine SAM to reflect the fact that IT and business strategies are moving closer together as technology evolves and becomes more integrated.

The initial framework adds a third vertical and horizontal domain to the SAM to reflect the separation of information/communication from technology, stressing the growing importance of information and information delivery (Fig. 2). Their main premise is that the use and sharing of information, and not the provision of information, are the real source of competitive advantage. Information sharing acts as a buffer between business and technology, making the benefits of information more apparent to the business.

The horizontal dimension splits the internal domain into structural and operational levels. The new middle row represents the more long-term architectural components, competencies and infrastructures of the organisation, combining all functional areas. The vertical dimension represents the internal and external information/communication aspects, the interpreting processes of information and communication and knowledge sharing. The vertical column is the translator, the finder of a common language between technology and business. At its core, where (infra) structure meets

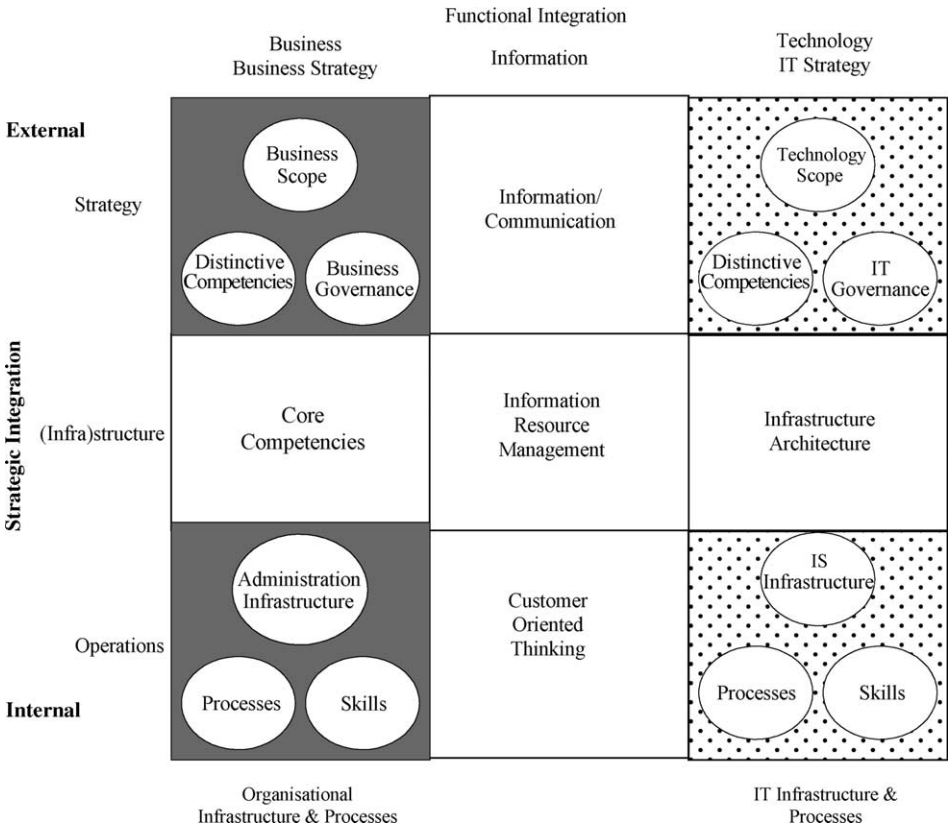


Fig. 2. A generic framework for information management (Maes, 1999).

information/communication, the authors introduce information resource management, and the benefits of a learning enterprise through knowledge sharing. Information sharing and communication are anchors for all other boxes within the model.

Goedvolk et al. (2000) develop a similar framework that focuses on the technical or architectural side of SAM. The architecture framework (IAF) aims to integrate the architectural design of business and IT and enhances Maes' work in two ways. First, it expands Maes' ideas on internal information requirements through adding an additional column, separating the information providers from the systems that provide the information. The new *information domain* represents the knowledge, communication and co-ordination of information. Second, it adds a third dimension to the model, which contains specific sub-architecture areas. These prescribe the design of organisational aspects that are the consequence of the introduction of an information system.

The generic framework and the IAF can be combined to form a *unified framework* (Maes et al., 2000) (Fig. 3). This is an attempt to transform the concept of alignment into a practical method, incorporating both management and design components.

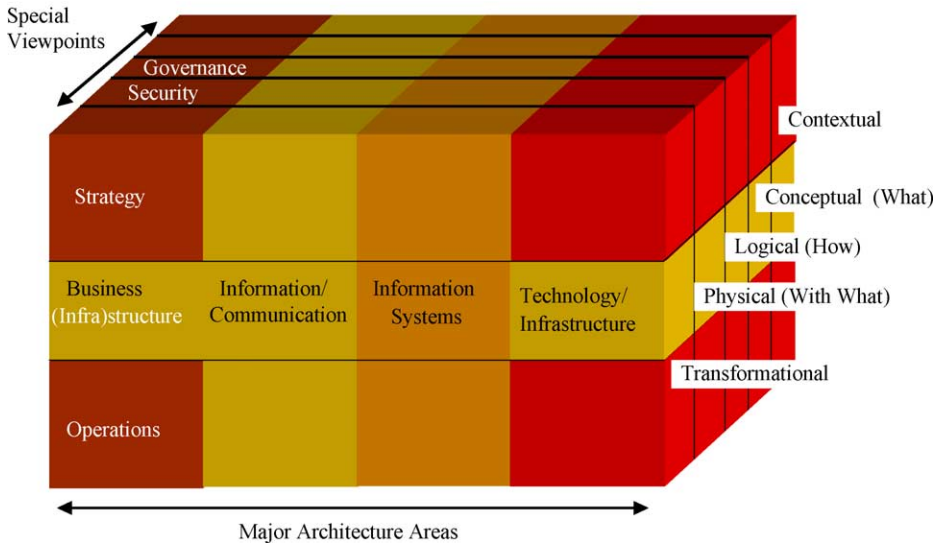


Fig. 3. Alignment through a unified framework (Maes et al., 2000).

### 3.3. Assessment of the strategic alignment model

It is important that the SAM and its extensions are of practical use, and that the model provides practical benefit. A manager can put any amount of information into predefined boxes, but when it comes to putting a measure to it in the real world, they find it difficult to translate (Ciborra, 1997). Unfortunately there is little in the literature at present that explains what a manager should do with these frameworks other than understand them conceptually.

The literature does, however, provide a reasonable explanation of what activities or systems should be placed in each domain of the original model. Both a generic explanation and an example, although now dated, are provided to add clarity to the framework (Henderson and Venkatraman, 1989). Further details are provided for the internal components of each domain, but only for the four original domains in the SAM (Henderson and Venkatraman, 1989; Papp and Luftman, 1995; Luftman, 1997). There is little in the way of examples of the newly introduced functional domains of information/communication and IS other than a name to the underlying components of each domain (Maes, 1999). Similarly, the split of operations infrastructure and processes into two levels, (infra) structural and procedural, has insufficient explanation to enable a thorough population of information into the structural domains.

Although the model is a little inflexible, it has a hardware bias and, with the advent of the internet, virtual networks and real-time information requirements, appears technically dated, the underlying theories are conceptually sound, even in today's environment. For any model to continue to exist and be practically relevant, not just conceptually relevant (McKay and Marshall, 1999), it should be implemented as a dynamic process and planning should be flexible enough to allow an organisation to take advantage of opportunistic developments, without having to improvise and disregard all planning. However, there is

currently little evidence of the practical application of the model. Even though Cap Gemini Ernst and Young, Netherlands (http://www.cs.vu.nl) have used this model, at least in part, practical examples are limited. There is, therefore, a need for further real world validation of SAM. We therefore now turn to our own empirical research.

## 4. Empirical research

### *4.1. Background*

The company where the research reflected in this paper was carried out is in the custody sector of the finance industry in Australia. It is part of a global firm, with a US-based head office. Globally, there are more than 18,000 employees. However, in Australia, the firm is a medium-sized enterprise with 400 employees. IT staff are at a ratio of 1:10 to business staff and the IT manager (CIO) sits on the executive committee. The global custody business is known for its low profit margins and limited customer base, hence technology is heavily leveraged to realise internal cost efficiencies and provide competitive advantage through products and services that add value. It is also an area where short turnaround times of accurate information, to anywhere in the world, is a standard requirement. The industry is moving towards a $T+1$ (2 day) settlement period for all market securities. This triggered frenzied IT development globally.

The executive committee is committed to maintaining a strategic advantage in IT and, prompted by the CIO, reviewed formal approaches to ensuring alignment between the firm's business and IT plans. The SAM was intuitively attractive but the executive had reservations about its 'academic' nature and agreed to support our research project to assess whether SAM could be used in practice. The study uses data from completed projects which were analysed against the SAM. The aim is to focus on existing processes, systems and procedures that directly impact or influence the strategic planning process and includes completed IT projects prioritised by the firm during the 12 months from January 2000 to December 2000. A cross-sectional analysis of data was performed and data were gathered and collated as a one-off event. The research consists of two phases: a *descriptive phase*, focusing on describing information management in terms of the domains and components of the SAM and an *explanatory phase*, using a matrix of real world data to depict the historical decision-making process concerning information management.

The focus of the research is limited to one area of investigation within one organisation. One of the authors participated in some of the projects as a systems analyst during the year in question, and subsequently remained as such in the firm whilst gathering the data. Although the outcomes may be interpreted for general use, the research is specific to this individual situation.

The organisational material gathered during this research comprises:

- Completed projects the projects were gathered from the yearly statistics on completed projects provided by the IT department. They involved all projects in which IT was required to some degree. A cross-sectional analysis of the project portfolio was performed.

- IT and business strategy documents these included the business strategy, IT strategy, and IT department goals. This information was gained through document gathering and informal interviews with IT and business management.
- Project prioritisation process information regarding this was gained through documentation, examining procedures and through informal interviews.

The objective of the analysis is to provide a starting point in the determination of the degree of alignment between business and IT strategies within the firm. The original concept of matching projects to their associated domains to depict an organisation's strategic intent and alignment was inspired by research conducted by Truijens and Maes (2000). Using this approach, we assessed the actual strategic direction of the completed projects and compared this with the planned strategic direction derived from the business strategy set at the beginning of 2000 by the executive committee.

### 4.2. Strategy determination and implementation

The setting of strategy and the prioritisation of projects is determined jointly by business and IT management. The company views the integration of these two processes as integral to achieving and maintaining strategic alignment. The CIO has been a member of the executive committee since 1997. The integration of IT and business initiatives into company strategy is indicated by the fact that, in 2000, three of the five corporate goals were IT-focused and three specific IT strategies were mentioned.

Company goals are grouped into main themes, for example *new business*, *internal efficiencies* and *people*. The management team reviews each goal and discusses possible strategies to achieve them. Sub-groups are then formed within the management team to focus on the achievement of one (or more) of the goals. An executive heads each sub-group. This ensures that the strategies and implementation of those strategies obtain equal weighting and representation within the executive committee. The sub-groups are accountable for the formulation and implementation of strategies to achieve their allocated goal(s). However, every manager is responsible for the achievement of all the goals, not just those that lie within their sub-group allocation. Performance and progress in achieving the objectives are communicated to the management team on a monthly basis. The strategic plan is also available for all staff members to review on-line through the intranet. Information dissemination is viewed as an important part of this process.

The output from this process is a set of projects. Alignment is also maintained at the project level. A *project prioritisation committee* ensures only those projects aligned to the organisational goals are allocated IT resources. The intention is for this committee to drive the planning process and ensure business leadership and accountability across the company on all projects. Each project is assessed on its potential to achieve a specific company goal and a specific process is followed to achieve this end. Although research was confined to specific data during 2000, information on prior years was obtained through informal interviews with various managers at differing levels. It became apparent that this process had been evolving for several years but the process outlined below had only been in place for two successive years previously.

#### 4.2.1. Stage 1

All managers who require IT resources to achieve an end result complete project request forms. The project request template includes a section to be completed on the expected benefits resulting from the development in monetary terms. An IT department representative then collates all project requests.

#### 4.2.2. Stage 2

A comprehensive list of all projects is submitted to the project prioritisation committee. Projects are considered within four major categories: competitive advantage, regulatory, infrastructure upgrades and internal efficiencies. The committee ensures there is no bias in one category at the expense of another. Projects are discussed on their merit and given a rating of high, medium or low.

#### 4.2.3. Stage 3

High level 'scopes' are compiled by the IT department on all projects rated high and medium. Scopes include anticipated effort involved in both human and technical resources and monetary cost for the project. Any hardware components required are also included.

#### 4.2.4. Stage 4

The project prioritisation committee is reconvened. The refined list, with costs and benefits now included, is presented and discussed at length. The committee decides which projects are to be allocated IT resources and assigns a sponsor to each project.

Company executives believe that this combination of strategic planning and project prioritisation ensures strategic alignment. By applying the data gathered from the completed prioritised projects to the SAM and the unified framework, this research attempts to assess the actual degree of alignment within the firm.

### 4.3. Results

In this organisation, 55 projects were completed and deployed by the IT department in 2000. Each project had been approved by the project prioritisation committee prior to development. As part of this prioritisation process, the projects for 2000 were allocated into four major categories: operating efficiency (OE), client demand, infrastructure upgrade and regulatory. In 2000, the allocation was:

| | | | |
|---|---|---|---|
| Operating efficiency | OE | 32 | 58% |
| Client demand | CD | 7 | 13% |
| Infrastructure upgrade | IU | 7 | 13% |
| Regulatory | R | 9 | 16% |

Projects within these categories were also classified by the area impacted and/or the nature of the project: competitive advantage (CA), health (ongoing maintenance) (H), and repositioning (R).

Table 1
Mapping completed projects to the strategic alignment model

| Business strategy | Information/communication strategy | Information systems strategy | Technology strategy |
|---|---|---|---|
| Categories: OE/R, R/R, CD/CA, OE/CA | Categories: OE/CA | Categories: OE/CA, OE/H | Categories: R/R, IU/H, CD/R, CD/CA |
| Projects: Repositioning, Globalisation, New Product Development, Internet | Projects: Global implementation, Intranet/Internet | Projects: Work-flow | Projects: Risk, Tax Reform, Security, Stability |
| **Business infrastructure** | **Information/communication infrastructure** | **Information systems infrastructure** | **Technology infrastructure** |
| Categories: OE/R | Categories: | Categories: OE/CA, OE/H, R/R | Categories: IU/H |
| Projects: Repositioning, Deployment | Projects: None identified | Projects: Workflow, Intranet/Internet, Sybase, Web logic upgrades | Projects: Communications, Spectrum disaster recovery |
| **Business processes** | **Information/communication processes** | **Information systems processes** | **Technology processes** |
| Categories: OE/CA, OE/R | Categories: | Categories: OE/CA, OE/H | Categories: |
| Projects: Global implementation, Repositioning | Projects: None identified | Projects: Systems migration, data source changes, procedural updates | Projects: None identified |

The completed projects were analysed and mapped by category/classification to the domains of the SAM and the unified framework. The results of the mapping exercise are shown in the domain matrix (Table 1).

Reviewing the spread of projects over the domain matrix, patterns began to emerge for different combinations of classifications; for example, between those projects classified as OE/CA. By connecting similar combinations, the beginnings of an alignment perspective began to emerge (Fig. 4).

The emergence of these patterns was encouraging, but we became frustrated as the patterns are, in themselves, not conclusive. We decided that this was largely because the starting point of the perspective, the *anchor domain*, had not been established. Establishing the anchor domain (and therefore the direction of the impact) determines the alignment perspective being followed in completing these project categories/classifications. Again, we became frustrated because establishing the anchor domain proved to be a difficult and somewhat subjective process. However, further contemplation suggested that the guidelines provided by Henderson and Venkatraman (1989) and Papp and Luftman (1995) might enable the perspectives to be determined. The anchor domains so determined are shown with different line patterns in Fig. 5.

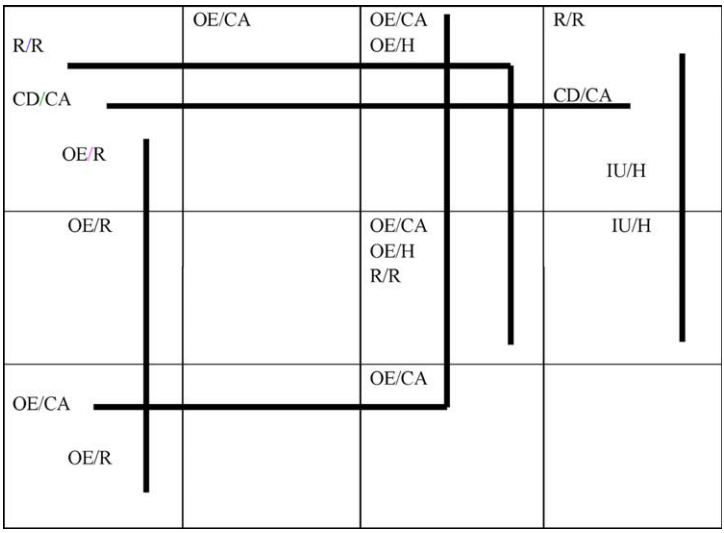


Fig. 4. Alignment perspective patterns without anchor domain.

The alignment perspectives identified by Henderson and Venkatraman (1989) and Papp and Luftman (1995) (see Fig. 6) could now be traced in the patterns shown in Fig. 5.

*4.3.1. Technology leverage (technology potential)*

Regulatory/repositioning (R/R) category/classification of 31 projects, predominantly new product development, client initiatives and strategic repositioning initiatives, which

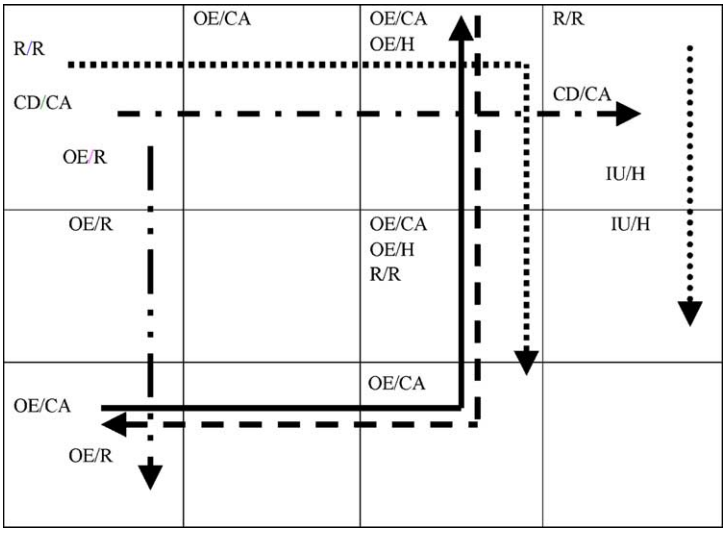


Fig. 5. Alignment perspective patterns with anchor domain.

| Organisational perspective | Cross-domain perspective | Description | Domain anchor | Domain pivot | Example |
|---|---|---|---|---|---|
| **Technology implementation (service level)** |  | The implications of technology strategy through IS design and process, and the impact of I/S products and services on organisation and management processes | Technology strategy | IS process | A necessary process for ensuring effective uses of the IS resources |
| **Technology leverage (technology potential)** |  | The formation of IT strategy to support the business strategy and how this impacts the IS architecture and processes | Business strategy | Technology strategy | A strategic joint venture to create a new approach to document handling required major changes to IS infrastructure |
| **Organizational requirements (organization IT infrastructure)** |  | The impact of the organisation on IS design of products and services and the adoption of an IT strategy to support the sustained development and delivery to the organisation | Organizational process | IS process | The organization is the market and IS is the major supplier |

Fig. 6. Alignment perspectives (modified from Henderson and Venkatraman, 1989; Luftman and Papp, 1995).

exhibit the cross-domain perspective shown in Fig. 6 (the following pattern in Fig. 5).



*4.3.2. Organisational requirements (organisational IT infrastructure)*

OE/CA category/classification of three projects, all relating to internal operating efficiencies, which exhibit the cross-domain perspective shown in Fig. 6 (the following pattern in Fig. 5).



*4.3.3. Technology implementation (service level)*

OE/H and OE/R category/classification of 21 projects, predominantly infrastructure initiatives and workflow initiatives, which exhibit the cross-domain perspective shown in Fig. 6 (the following pattern in Fig. 5).



We were now enthused as genuine alignment patterns as described by the SAM were beginning to emerge in the projects being reviewed.

*4.4. Assessment of strategic alignment*

Three perspectives are identified by the project mapping process: two dominant, *technology leverage* and *organisational requirements*, and one less dominant, *technology implementation*. The most dominant alignment perspective is the technology leverage perspective, otherwise known as *technology potential* (Luftman and Papp, 1995). This is

in keeping with the vision to be a technology firm that delivers financial solutions, rather than a financial firm that provides technology solutions. It is notable that as business and data volumes continue to increase, staff levels have not increased for several years, further suggesting the dependence on IT solutions.

Several inter-linking management practices are identified as instrumental to the process of alignment, these being the process of setting strategy and prioritising projects. By analysing the prioritised projects it is evident that the business strategy has incorporated IT initiatives into the strategic direction and corporate goals, and that the business is driving those initiatives. By their inclusion in the business strategy, the executive committee indicates that these initiatives are viewed as integral to maintaining external competitive advantage or internal operating efficiencies. The IT strategy remains separated and supports the business strategy, aligning all its initiatives to business strategy down to the lowest levels. The components of IT strategy will always remain separate, as do other functional areas (e.g. human relations, finance) to drive specific technical initiatives. This move towards integrated strategies is partly due to the representation and participation of IT management on the executive committee in recent years. This suggests a progression from previous practice (Avison et al., 1999a,b).

## 5. Proposed framework

One purpose of this research is to identify or develop a practical framework for managers in general, though it is likely to be used by technology managers, to help them to identify the current level of alignment with the business and also to control future alignment. On completion of the domain analysis, management should be able to determine their understanding of the firm and its alignment, i.e. they should have the following:

*A completed document* that details the position across the firm, in terms of business, information, IS and technology, from a strategic, structural and operational perspective. This indicates a good understanding of the firm, and its interrelationships and interdependencies.

OR

*An incomplete document* with gaps in some of the domains, indicating a poor knowledge and/or understanding of the firm, and its interrelationships and interdependencies.

If a complete analysis has been performed, management will have sufficient information to allow a graphical interpretation of the firm's position from a strategic, structural and operational perspective. This, in turn, will identify the type and degree of alignment.

This research identifies a process that enables a manager, or management team, to determine the alignment perspective taken by their firm and enable them to change the perspective to ensure the IT strategic direction is aligned with the business strategic direction, through the re-allocation of project resources.

This is a four-step process:

### 5.1. Step 1

Complete an organisational profile as it currently stands, by performing an analysis on the individual domains and components, for example *technology strategy*—governance/scope/competencies.

### 5.2. Step 2

To this profile apply the *proposed projects* for the coming year. This assists the analysis if the projects have been classified in a manner representative of the firm's business. Every project should be able to be applied across at least one domain. If this is not the case, either the analysis requires further definition or the project is not in line with the firm's business (management should therefore consider removing the project or changing its scope). Once all the projects have been mapped across the domains of the model, a graphical representation of the positioning of project groupings should be possible. This will provide an indication of, but not the direction of, the firm's alignment perspective (Table 1 and Fig. 4).

### 5.3. Step 3

To determine the direction, *compare* the groupings in step 2 to the individual alignment perspectives outlined in the model. Management should choose the perspective(s) that best matches each project or project grouping. This will identify the intention of the project (anchor) and highlight what management anticipates the project to accomplish (pivot) on delivery. This will determine the actual alignment perspective that will be achieved on the completion of the group of projects being analysed.

### 5.4. Step 4

This alignment perspective is compared to the firm's objectives and goals for the future. Management can now *determine* if these goals are in line with the perspective that will be achieved by completing the allocated projects and determine if successful completion of all the projects will move the firm towards its goals. If the alignment perspective favoured by the business strategy does not match the alignment perspective that will be achieved upon the projects' completion, the firm can re-allocate its resources to projects that affect the specific domains required to achieve the desired perspective, thus ensuring alignment. For example, if the organisation discussed in the paper wanted to move from technology leverage to technology exploitation (IT choices enabling business strategy) they should dedicate more resources to projects that focus on competitive advantage and repositioning through client demand, rather than operating efficiencies.

Initially this model is used to determine a firm's existing level of alignment. Management should first determine which perspective best fits the firm's strategy. By comparing this preferred perspective to the actual perspective followed, management are

provided with an assessment of the current level of alignment. Preparing a detailed analysis of the interdependencies between all the internal and external domains, and allocating the past projects to each dependency, determines the perspective actually followed. Looking at the spread of projects over the domains, patterns will begin to emerge for different combinations of classifications. By connecting similar combinations, the beginnings of an alignment perspective will emerge.

Once established, the same analysis can be used on projects for the current year to monitor and track alignment. With the core of the domain analysis completed in the first year, each subsequent year requires only an update of information and a small commitment of time by management. If the current project classifications do not deliver the desired perspective, management should consider dropping them and reassigning resources to projects that will bring about the desired perspective. Accurate and consistent project classification is important to the outcome.

This process can then be used to structure or manufacture a desired future alignment perspective. This is a dynamic process that gives a firm the flexibility to take advantage of opportunistic developments, without having to abandon all planning. The analysis will have identified which project groupings the firm needs to focus on to achieve each perspective. By choosing only projects that meet this criterion, a firm can switch its alignment perspective to accurately meet any changes in strategic direction.

## 6. Conclusions

A key contribution of this research is the development and assessment of a tool for aligning IS and business strategy and its concomitant processes. This process meets the criteria of enabling management to diagnose, achieve and maintain alignment. The paper proposes a practical tool designed to guide technology and business management alike towards the most productive utilisation of technology resources. By examining the projects worked on over a previous period, management can retrospectively determine current alignment. It can then be used to monitor and track alignment and it can be used to pre-empt a change in strategy and implement a new alignment perspective by re-allocating project resources. Combined strategic planning through all levels of the firm and some form of project prioritisation process by the executive committee is vital to the alignment process, as is IT representation on the executive committee.

In addition, this research also enables insight into a number of other issues raised in past alignment research. It contributes to filling the gap in understanding how alignment is actually achieved in organisations in a dynamic environment. The current work is firmly in the process paradigm (Reich and Benbasat, 2000) and concurs on the key role of senior management. The research also demonstrates that IS planning is a mechanism by which linkage may be achieved. Yet this planning is embedded in a context that realises the value of IS to the business. Here, alignment is shown to be amenable to measurement and that strategising can be a useful part of the alignment process. Further, written reports play a role in understanding the dynamics of alignment as part of a triangulation process (Tallon and Kraemer, 2003).

In line with Tallon et al. (2000), the organisation used for our study is dual-focussed with regard to its IT use as it both seeks operational efficiency but also sees IS as a mechanism for gaining competitive advantage. The executives of the firm recognise the need for alignment and seek it. The firm also has the characteristics of an analyser in its uses of IT and its desire to achieve better performance via aligned IS (Hirschheim and Sabherwal, 2001; Sabherwal and Chan, 2001). The research also demonstrates the issues that Reich and Benbasat (2000) contend contribute to alignment—shared domain knowledge, IT implementation success, communications and planning connections and business direction. However, these seem to be on a more long-term basis than Reich and Benbasat claim. Finally, it is unclear if, given the timing of the research, a punctuated equilibrium model (Sabherwal et al., 2000) best explains what is going on. Evolution rather than revolution seems apparent in the firm under study.

However, this research concerns one organisation only. It is obvious that this research would be greatly enhanced by similar research in other organisations so that comparisons can be made. Further, studies that show changes in an organisation's alignment over a longer period would also form an important additional contribution.

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