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Peko, Gabrielle and Sundaram, David, "Adaptive Enterprises: Interweaving People Process and Technology" (2010). *PACIS 2010 Proceedings*. 97.

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ADAPTIVE ENTERPRISES: INTERWEAVING PEOPLE PROCESS AND TECHNOLOGY

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Abstract

Today's world is a complex interconnected environment where interconnected enterprises participate in global business. The global business world is characterised by rapid and unpredictable change that results in enterprises being challenged at all levels. Customers, employees, partners, investors and society are all sources of uncertainty. Traditional deliberate strategies based on cycles of stability and predictability are no longer relevant for today's business environments. Emergent strategies have been advocated by many as the solution. However the thesis of this research is that enterprises need to interweave the deliberate with the emergent. A review of current research and industry literature suggests large gaps exist in terms of strategies, processes, structures, and information systems that intrinsically, fundamentally, and seamlessly interweave the deliberate and emergent aspects to support adaptive enterprises. In this thesis we investigate and propose how this interweaving of the deliberate with the emergent could be conceived and realised in terms of strategy, business processes, organisational structures, and information systems. The research is interdisciplinary in nature and spans management, operations, and information systems.

Keywords: Adaptive Enterprise, Strategy, Business Processes, Adaptive Information Systems.

1 BACKGROUND AND CONTEXT

We live in a world that is characterised by complexity, unpredictability, and uncertainty. Business enterprises operate in an unstable environment where customers are less product loyal, they want greater choice and price transparency; there is a global shortage of business talent; investors demand superior returns on their investment and they are more active and flexible in the way they invest. In addition, society has expectations about the way in which business is conducted and companies are required to operate ethically. Public opinion can change rapidly and impact negatively on an enterprise's profits and sustainability. Added to these factors is the relentless stream of mergers and acquisitions (Dale, 2007). This instability, characterised by the ever increasing rate of change, necessitates change in the way enterprises conduct their business (Dale, 2007; Heinrich & Betts, 2003). Change in terms of the way business is conducted means there is a corresponding change in business models and the business processes that support those models.

One way the enterprise can respond to the challenges of rapid change is to consider its impact at three levels of abstraction. First, macro level changes that impact an enterprise and its strategic direction. Second, macro and micro level changes that can affect the enterprise's business processes (BP) and organisational structure, or the way business is conducted. And third, changes to the Information Systems (IS) that are required to implement and support the business processes and changing strategy.

Most enterprises manage their strategy, business processes, the organisational structure, and their information systems in a disparate way rather than adopting a cohesive approach. This lack of cohesion can result in serious problems for the enterprise if it is unable to respond and adapt to rapidly changing business conditions.

2 DELIBERATE OR EMERGENT OR ADAPTIVE

One of the main reasons why enterprises cannot adapt quickly is that a deliberate rather than emergent approach has been taken in regard to strategy, business processes, organisational structure and IS. For example, when investigating the way enterprises formulate and implement strategy, it can be identified that many follow a particular strategic method or strategic paradigm. This method advocates a very deliberate approach. First, the external environment is analysed and, based on the results of the analysis a strategy is then formulated. Once the strategy has been formulated and accepted it is communicated to members of the enterprise and subsequently implemented. After implementation, feedback on the strategy is collected, and assessed. Based on the assessment a fresh strategy cycle of reformulate, communicate, and implement is followed. The strategy formulation process is carried out in a structured fashion and is therefore deliberate. It is so ordered and deliberate that if change takes place during the process of formulating, implementing and monitoring the strategy, there is no built in mechanism that allows a change of plan. Most enterprises that adopt a deliberate strategic approach also do not have business processes and organisational structure or IS that enables it to react to any changes that occur while in the midst of the strategy management lifecycle.

An alternative to the deliberate approach is an emergent approach, the ability to react quickly to changing conditions. On the surface it appears that an emergent approach is more suited to the current turbulent environment. However, a study conducted by Mintzberg, Quinn and Goshal (1998) discovered that many enterprise are so focused on trying to react to the changes in their environment that the deliberate strategy for the most part becomes totally unrealised. In the effort of trying to respond to the changing environment most of the enterprise's realised strategy is purely emergent but an emergent strategy can lead to chaos because there is a lack of direction and control.

Therefore, the dilemma for most enterprises is deciding which of the two approaches, a deliberate approach or an emergent approach is better. A growing number of academic and industry writers advocate that neither a deliberate nor an emergent approach is appropriate in today's environment but rather a combination of the two, a deliberate-emergent approach, is best (Eisenhardt & Brown, 1998; Birkinshaw, 2006; Yip & Johnson, 2007). For the sake of simplicity and ease of understanding, we

define adaptive as a term to reflect a deliberate-emergent approach. However, not all authors agree as some still maintain that a deliberate approach allows greater certainty in an uncertain environment. This highlights that there are multiple viewpoints about how to deal with the current environment in which enterprises find themselves. This research suggests that enterprises can be thought of in terms of Scott Morton's MIT90's Framework (1991) but they should also have the ability to formulate strategies that can be translated into adaptive processes and adaptive structures. These adaptive processes and structures should be populated by adaptive individuals in composite flexible roles and the four elements together supported by systems and technologies that have inherent capabilities of adapting. These points are explicated by Kumaran et al. (2007) and Scott Morton (1991).



Figure 1: Adaptive Organisation: from conception to realisation, interweaving the deliberate and emergent

3 STRATEGY

The Oxford Dictionary defines strategy as a "plan designed to achieve a particular long-term aim" (Pearsall, 2001). However, Mintzberg (1987) suggests that in a business context a strategy is more than just a plan. He suggests that it is a 'pattern' that is found in a stream of actions, a market position, and the enterprise's perspective. Mintzberg and Waters (1985) introduced the idea of a strategy as consisting of two elements: deliberate strategy and emergent strategy. This view is supported by Ocasio and Joseph (2008), they defined strategy as "a framework, either implicit or explicit, that guides the organisation's choice of action. They suggest this broad view of strategy is both "planned and emergent, resulting from strategic design, the evolution of a pattern of decisions, or a combination of the above" p250.

3.1 Deliberate Strategy

A deliberate strategy is a strategy that is carefully planned and controlled by the enterprise. The traditional strategies are deliberate strategies. The reasons for this are that these strategies begin with an idea, a plan is then developed, the plan is communicated, and some form of action(s) follows. The purpose of what can be considered as a traditional strategy is to create and maintain a long term definable position that results in competitive advantage within the market (Mintzberg & Waters, 1985; Eisenhardt & Brown, 1998). A seminal and definitive work on corporate strategy 'Competitive Advantage' (Porter, 1980) discussed what is now known as Porter's Strategy Models. It could be argued that Porter's work on competitive strategy focuses on deliberate strategies as his definition is that a formal corporate strategy "provides a coherent model for all business units and ensures that all those involved in strategic planning and its implementation are following common goals" (Porter, 1980 p12). Porter posits that strategic planning should articulate a calculated, planned approach.

3.2 Emergent Strategy

Emergent strategies are those strategies that have developed as part of a "pattern in a stream of actions" p12 and are divorced from any preconceived plan (Mintzberg, 1987; Hamel & Prahalad, 2005). The pure form of an emergent strategy lacks intention but despite lack of intention there is "order and consistency over time." (Mintzberg & Walters, 1985 p258). This strategy is the ability of the enterprise to be responsive to the environment in order to maintain its competitive position. Bonnet and Yip (2009) refer to strategic agility, it is the ability an enterprise has to constantly, "sense, assess and react to market conditions" p.52. They suggest that in today's turbulent markets strategic agility is necessary rather than the idea of sustainable competitive advantage.

3.3 Adaptive Strategy

There are not many current strategies that are purely deliberate or purely emergent (Mintzberg, 1994). The reason is that a purely deliberate strategy implies that no learning takes place during implementation while a purely emergent strategy suggests that there are no boundaries or limitations and so the strategy is uncontrolled. "Sometimes strategies must be left as a broad vision, not precisely articulated, to adapt to a changing environment" (Mintzberg, 1994 p112). However, fundamentally "the concept of strategy is rooted in stability" (Mintzberg, Ahlstrand & Lampel, 2005 p32).

Reacting to the environment is important but anticipating and even setting the pace of change is more so, as time pacing is relevant to strategy. Therefore, strategy involves "successfully balancing on the edge of time between the past and future" (Eisenhardt & Brown, 1998 p788). Time, however, is not a major issue in the traditional strategic approaches whereas time is central to a "competing on the edge" p788 strategy. In a deliberate, emergent strategy time encompasses both the notion of "stretching out the past" p789 together with probing into the future in order to obtain a strategy that is both deliberate and emerging (Eisenhardt & Brown, 1998).

4 BUSINESS PROCESSES

Given the rapidly changing demands of an enterprise's business environment and the many challenges that this uncertainty brings, enterprises are focusing on their business processes (BP) as a means to deliver the specific results that are required to meet both internal and external needs. Business processes, as defined by Sharp and McDermott (2000), "are a collection of interrelated work tasks, initiated in response to an event that achieves a specific result for the customer of the process" p58. Given that a process exists to serve the customer it can therefore be perceived as a key to sustainable competitive advantage. Keen (1997) supports this view and argues that BP and their improvement is a strategic imperative.

4.1 Deliberate Business Processes

Business process management is increasingly recognised as an integral part of enterprise transformation. Business process management is characterised by a transformation of the interrelated enterprise's subsystems and routines (Kettinger, Teng, Guha, 1997; Benner, 2009). A number of frameworks have been proposed by academics and consultants to manage the transformation process of business process. However, most of these advocate a structured deliberate approach that consumes a lot of time, money and effort to often produce only mediocre gains (Billington & Davidson, 2008). One such framework is the Process Lifecycle (Rosemann, 2001). It follows a step wise approach from the initial identification of the current as-is process through to the development of the improved to-be process that is then implemented. The cycle is completed by monitoring and control of the new and improved implemented process. However, the process lifecycle management approach, is a static approach because it does not accommodate mid cycle change. Therefore, the sense, respond and adapt aspect of the life cycle orientation is limited by the very nature of the cycle itself.

4.2 Emergent Business Processes

New processes are constantly emerging during the execution of daily business. The term used to describe these new, evolving, knowledge-intensive business processes is emergent business processes (EBP). Emergent business processes are organisational activity patterns described by Markus, Majchrzak and Gasser (2002) as processes in which, "problem interpretations, deliberations with no best structure or sequence, and actions unfold unpredictably" p182. A defining characteristic of these emergent business processes is that they cannot be predefined as their models are based on accumulated experience and evolve from the execution of business events (Marjanovic, 2005).

4.3 Adaptive Business Processes

A number of authors have used Jazz music improvisation a metaphor for adaptive business processes. Scheer (2007) explains that a good jazz group, made up of skilled musicians (experts), who when playing together are constantly communicating in the same time and place. Each playing is listening and responding to each other with particular emphasis on the soloist. Each player responds to the soloists development of the melody who in turn is being impelled by the rhythmic figures from the group's rhythm section (typically, piano, bass and percussion). During an improvisation the soloist uses the structure of the music lead sheet (music piece) as a scaffold (harmonic progression) and within that scaffold creates new melodies on the spot. Applying the jazz metaphor to the management of business processes, the jazz group's process of improvisation is analogous to a source of constant emergent processes. While the scaffold that the soloist uses determined by the lead music sheet is analogous to deliberate processes. Therefore, the metaphor of jazz improvisation can be used to illustrate adaptive processes.

5 ORGANISATIONAL STRUCTURES

An organisational structure exists for management and control purposes. It defines the work roles and how activities are grouped together (Lasher, 2005). Fritz (1996) suggests that an organisational structure is more than just a management reporting structure, it is an "entity made up of elements or parts (such as people, resources, aspirations, market trends, levels of competence, reward systems, departmental mandates, and so on) that impact each other by the relationship they form" p4. The way an enterprise is structured has implications for how strategy is translated throughout the enterprise and ultimately how the enterprise performs. Roberts (2004) posits that "certain strategies and organizational designs do fit one another and the environment, and thus produce good performance, and others do not. " p32.

5.1 Deliberate Organisational Structures

Many enterprises are structured as a functional organisation that supports a deliberate approach. Bryan and Joyce (2007) argue that most enterprises are designed for a past industrial age where vertical integrated structures were designed for efficient operations. These vertically integrated structures exhibit high levels of hierarchical authority and control and are more suited to a stable environment. Furthermore, Labovitz and Rosansky (1997) suggest that traditional, hierarchical, organisational structures are designed to break up managerial tasks into pieces: departments and divisions. This segmentation makes it difficult to integrate the enterprise's strategy, business processes and systems into a cohesive working whole. The organisational structure actually becomes a barrier to change and improved performance.

5.2 Emergent Organisational Structures

A virtual organisation structure is an emerging organisational form where employees interact with each other almost completely, using telecommunication systems. A virtual organisation structure allows for high levels of connectivity both among the individuals members of the enterprise and with the environment. It is an extremely flexible structure that allows an enterprise to be reactive and innovative.

5.3 Adaptive Organisational Structures

A Matrix organisational structure supports both the emergent and deliberate management orientation. The matrix structure consists of the vertical management and control lines of a product orientated structure combined with the horizontal lines of a functional structure. Furthermore, these management reporting lines are extremely flexible. Flexibility and Stability can be used to illustrate an important aspect of an adaptive organisational structure. When an enterprise has low levels of connectivity and high levels of control flexibility and creative behaviours are prevented. The presence of rigid organisational structures and rules and the lack of communication and interaction mean the work processes are set and people isolated. Therefore, the enterprise will be unable to react to change in a timely way. Enterprises with traditional top down hierarchical management structures have high levels of intensity of control and low connectivity. These enterprises are inflexible and only succeed in a stable environment. They follow a deliberate approach. While, there are enterprises at the bleeding edge. These enterprises are very reactive, connectivity between parties and the external environment is very high. They are constantly sensing the environment and trying to respond to change. However, these kinds of highly reactive, volatile enterprises have low levels of control (Scheer 2007).

Neither of these extreme positions is good (Eisenhardt & Brown, 1998; Scheer, 2007). One extreme position is characterised by deliberate, deliberation and stability while the other is characterised by chaos, flexibility and possibly innovation and even anarchy. However, Scheer (2007) suggests that the best place to be on the edge of chaos where enterprise's balance flexibility and stability. The edge of chaos equates to an adaptive approach as defined in this research. The adaptive approach is when enterprises have what is meant by deliberate enterprise structures that support stable evolutionary growth and also flexible structures that support more opportunistic growth.

6 INFORMATION SYSTEMS

To effectively support an enterprise's business processes, and in turn business strategy, an integrated information systems (IS) infrastructure is absolutely essential. There are various Information Systems that go towards supporting processes in an enterprise (Scheer 1998). Scheer (1998) suggests an integrated enterprise IS infrastructure with five organisational levels. At the lowest level of the organisation 'quantity-orientated operating information systems' are implemented in functional areas such as purchasing, production, sales and marketing and human resource management. At the next two levels up, there are 'value orientated accounting information systems' and 'reporting and controlling information systems' to support accounts payable and receivable, inventory and fixed asset accounting and personnel accounting. At the fourth level of abstraction there are 'analysis and information systems' for example, purchasing, production, sales and marketing, and personnel information systems. Finally, the top level has strategic and decision support systems. All these information systems are traditional application systems that monitor processes (not activities) at the lowest level.

6.1 Deliberate Information Systems

Over the past twenty years enterprises have implemented enterprise resource planning (ERP) systems. These information systems are integrated enterprise-wide systems and are a technological response to the integrated information systems environment proposed by Scheer (1998). These systems are predominantly based on a very deliberate approach to the management of the enterprise's transaction and business processes requirements. They follow a very rigid structure and once configured and implemented they are quite difficult to change. The systems and the processes and the organisational structures do not allow for emergent phenomena to be easily supported. There is a tension between flexibility and stability.

Most traditional application software have a very deliberate orientation and mainly support deliberate processes and deliberate strategies. Most software platforms and solutions are quite deliberate, for example SAP R/3, PeopleSoft Enterprise Applications, JD Edwards, and Baan IV Solution to name a

few (Nah, 2002). They do not support the emergent or adaptive approach. It is only the more recent architectures that are trying to support emergent and adaptive approaches in terms of procedural responses (the way in which you implement the system) and technological responses (Upton & McAfee, 2000).

6.2 Emergent Information Systems

More and more one is seeing information systems that support a purely emergent approach. These information systems possess what is termed in literature and industry as an Event Driven Architecture (EDA). From a conceptual perspective the EDA components and sub-systems are totally decoupled (not dependant on other software applications) and mostly asynchronous. They support event processing in real time and thus support an emergent approach. EDA are supported by a number of different vendor platforms such as IBM's. This platform supports a purely emergent approach because it does not come with any pre-defined services but provides complete application functionality to create any services as and when required. The platform supports the creation of primitive as well as composite services. If something changes the primitive and/or composite services can either be changed or a new service (primitive or composite) can be created from scratch. Unlike the SAP and Oracle platforms the IBM platform does not come with a core repository of predefined services to support processes. However, primitive services and composite services can be bought from a service provider such as SAP, Oracle or other external sources on an as-needed basis. This makes the platform extremely flexible and reactive because services can either be created from scratch or acquired and plugged in. Therefore, the IBM platform can be viewed primarily as one that supports the modelling, design, management, and deployment of services and as such designed well to react to emergent behaviour.

6.3 Adaptive Information Systems

When one looks into the details of SAP's Evolution of Business Process Management (BPM) all the traditional technologies (process modelling, workflow automation, enterprise application integration) take a very deliberate and rigid approach towards the management of business processes. But the pathway to competitive differentiation according to SAP is through 'Business Network Transformation' termed as BPM 2.0 and beyond. BPM 2.0 and beyond according to SAP will be achieved through flexibility enabling the business process lifecycle by leveraging components and sub-systems such as Business Rules, Business Activity Monitoring and System to System (S2S) BPM. These are all technologies whose express purpose is to support emergent behaviour.

However, SAP recognises that the EDA as a standalone architecture that supports the pure emergent approach is not able to achieve the key business drivers for business transformation on its own. It also recognises that an adaptive enterprise also needs modelling, simulation, and analysis and a balance between human tasks and S2S BPM total automation. SAP proposes an Enterprise Service Orientated Architecture (ESOA) that comprises of EDA components/systems and enterprise modelling, simulation and analysis, and process collaboration capabilities components/sub-systems that support the adaptive approach. Along with SAP, most Enterprise System (ES) vendors are advocating the implementation of IS based on a service-oriented architectural (SOA) approach. SOA is defined as "a technology neutral architectural concept based on generally (re-)useable services." (Herrmann & Golden, 2006 p5). While pure SOA from vendors such as IBM could be deemed to lie in the pure emergent space, ESOA offerings from vendors such as Oracle and SAP could be considered to be originating from the deliberate space but tending towards the adaptive space. There are also hybrid systems architectures such as Oracle's that support EDA and consequently the emergent approach. These architectures support Mintzberg's vision of emergent strategies through the constant monitoring and analysis of meaningful events (patterns of behaviour) within the enterprise's event cloud. In addition many of these hybrid information systems have support for the deliberate approach through explicit modules/components/sub-systems to support Business Process Management (BPM). These information systems possess a whole host of components/sub-systems that explicitly supports the EDA paradigm such as Business Activity Monitoring (BAM), Complex Event Processing (CEP) and

Business Rules Management (BRM). Such support for the deliberate (BPM) and the emergent (BAM) is well illustrated by Oracle's architecture.

6.4 Design Principles of Adaptive Information Systems

Generic frameworks proposed by industry heavy-weights such as Sun reiterate similar principles for architectures to support adaptive information systems. They emphasise the need to have architectures that are process driven, user centric, service oriented and loosely coupled. And it is especially this loosely coupled aspect that helps enterprises in being emergent and reactive to what is happening. This loose coupling enables one to rapidly decompose and recompose service chains to support rapidly changing process requirements. User centricity emphasises the need for flexible user interfaces that can be personalised, role-based, adaptable and adaptive, evolving as the users and user needs change. Highly adaptable process flows enable the rapid composition of new flows as well as the modification of existing flows. Such flows can be in the realm of transactions, decisions, and/or collaborations. These four principles can be considered to be the cornerstones of adaptive architectures. These principles are further reiterated by Van Praag (2007). However Van Praag (2007) adds another pillar to the adaptive enterprise. Van Praag (2007) suggests that modern distributed real time enterprise architectures will be powered by SOA as well as EDA patterns in combination as appropriate. He goes on to suggest that the real time enterprise architecture will be a fusion of these different approaches.

7 ROADMAPS

Roadmaps are prescriptions that enable an organisation to realise strategies in terms of business processes, organisational structures, and information systems. Because of their prescriptive nature, most roadmaps that address the implementation and support of adaptive enterprises have been proposed primarily by industry.

7.1 Deliberate Roadmaps

Roadmaps that have been proposed in literature and by vendors and business consultants have been for the most part very deliberate in their orientation. Even more, most of the roadmaps have been rather myopic and uni-dimensional in character. One particular roadmap stands out in terms of cohesiveness and integration of strategy with business process with information systems. This is the 'Strategic Enterprise Management' process proposed by SAP (2009). However, this is a very deliberate roadmap since the feedback for corrective action occurs only at the end of the strategic management process. Another roadmap, the 'Business Process Transformation Roadmap' proposed by ARIS (2009) has similar characteristics but that too is quite deliberate. Here again the feedback, which is an opportunity to change tack, occurs only at the end of the cycle. There are no intermediate points for reflection and recalibration.

7.2 Emergent Roadmaps

The 'BPM Scenario Life Cycle' roadmap proposed by IBM (2006) could be considered to be an emergent roadmap. This roadmap suggests that one gathers requirements, models, simulates, and designs. These designs are implemented by the discovery of services, creation of services, and/or purchase of third party services. These services are then composed to support processes. Obviously they are tested at the primitive and composite levels. These are then deployed through appropriate integration of people, processes, information and systems. The deployed processes and systems are monitored, controlled, and governed on an ongoing basis. As new needs arise or when these processes and systems go out of sync it presents us with a fresh opportunity to model, assemble, deploy, and manage. There is no strategic direction implied in this roadmap. One keeps reacting to whatever circumstances that arise this tendency towards the reactive places this roadmap in the emergent quadrant. The 'Micro-level Process Modelling Cycle' from SAP (2009) appears, on the surface, to be a very deliberate roadmap. However, we notice that this roadmap has the explicit step of

accommodating 'new micro processes' after the performance of 'strategic process analysis'. We conclude that this feature enables this cycle to be performed many times within a broader macro level emergent and/or adaptive change management cycle.

7.3 Adaptive Roadmaps

There appears to be a dearth of roadmaps based on the adaptive approach that address the implementation and support of an adaptive strategy by an enterprises adaptive business process, adaptive organisational structures and adaptive information systems. In the absence of such roadmaps, two frameworks will be discussed that could be considered partial adaptive roadmaps because of the adaptive elements that they contain and their effort to support the development of an adaptive enterprise. The first roadmap to be discussed is the 'Model Driven Business Transformation' (MDBT) framework by Kumaran et al., (2007). The MDBT framework is a business transformation methodology that "allows business strategies to be realised by choreographing workflow tools and human activities". The second roadmap presented is Heinrich and Betts (2003) 'Roadmap to Adaptive Business Networks' (ABN). Although this roadmap had been developed by the authors to support the evolution of an Adaptive Business Network rather than an adaptive enterprise, many of the ideas and mechanisms contained in the model are very relevant to an adaptive approach. The framework is a partial adaptive roadmap because at the business operations layer, which concerns the understanding of the business by the business owners, key performance indicators (KPI) are used to monitor and control progress towards achieving the enterprise strategic goals. If the enterprise's performance appears to be in decline a correction is made to the composition of the defined business services and strategic KPI's. After further monitoring, if that correction stops working the enterprise then tries to optimise the business processes and operations. Then if that does not work it realigns its operations to the strategy it is trying to follow. The cyclical alignment and realignment of business operations to strategy by the continual monitoring of business performance as shown in the roadmap, is an example of the adaptive approach albeit a limited example. It is limited in two major ways. First, the framework's monitoring implications seem to be on current internal processes only. The framework does not consider (monitor) signals from the enterprises external business environment. Second, although there is an implication of aligning business operations to strategy there is no suggestion of changing the strategy in response to continuing poor performance. That is, there is no evidence of re-strategising. In summary, the framework is adaptive for internal requirements but it does not account for processes and routines that have emerged in response to external influences. The Heinrich and Betts (2003) 'Roadmap to Adaptive Business Networks' was developed for the evolution of ABN. Yet, it can be considered in the context of an adaptive enterprise. It contains a number of concepts and elements that apply to an adaptive roadmap for the development of an adaptive enterprise. The roadmap consists of four steps that lead to adaptability: Visibility, Community, Collaboration and ultimately Adaptability. Each step contains its own requirements and outcomes. Many of the requirements and outcomes depicted in the roadmap are indicative of adaptive requisites and behaviours (adaptive elements). For example, achieving the first step visibility by sharing information both internally and externally supports the emergent approach. Also, Steps two and three, Community and Collaboration, are prerequisites of the adaptive approach. In addition, all the mechanisms, right from visibility to connectivity to collaboration to adaptability, support and evolve both deliberate and emergent strategies, business processes, organisational structures and information systems. The business transformation framework is an example of a framework that tends toward an adaptive roadmap. The framework is evidenced by some adaptive elements but these elements are limited. Therefore, we suggest it is an example of a partially/incipient adaptive roadmap.

8 CONCLUSIONS

As mentioned in the introduction, the key research problems are inherent in the components of an organisational system, namely strategies, business processes, organisational structures, and information systems and how these are managed and evolved in deliberate, emergent and or adaptive ways. We define adaptive broadly as approaches (strategies, processes, structures, and or systems)

that attempt to intrinsically and fundamentally interweave the deliberate approach with the emergent approach.

There are also problems associated with adaptive strategies being translated into adaptive processes and adaptive organisational structures. In addition, there is a problem with how adaptive systems can support the adaptive processes and organisational structures. These problems are illustrated in Figure 2 and are the motivators for our research.

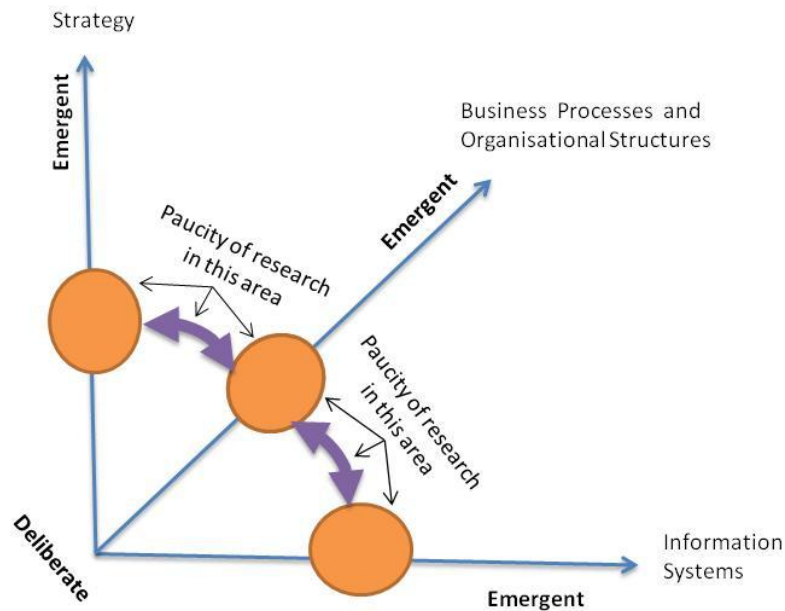


Figure 2: Research Lacunas

A review of both academic and literature from industry relating to business strategy, business processes, organisational structures and information systems, reveals that some aspects of deliberate, emergent and adaptive approaches are not well developed although other areas have been well researched. For example, there has been significant research and subsequent literature in regard to general management, more particularly deliberate strategy. However, there is little literature about pure emergent strategy. Furthermore, in recent times it has been acknowledged by researchers that there is a gap in understanding about adaptive strategy. This gap is particularly relevant as it seems that the need for an adaptive strategy is now being acknowledged.

With regard to the literature about Business Process Management, most of it advocates deliberate business processes. Though there are a limited number of articles about emergent business processes the research on adaptive business processes is virtually nonexistent. When we think about the organisational structures to support such processes the literature is not as bleak. There is a plethora of academic literature in the general management domain in regard to organisational structure, particularly traditional hierarchical structures that support a deliberate approach. There is also plenty of literature, although to a lesser degree, about flat, network, process and virtual organisational structures. These structures are more oriented toward the emergent approach while a virtual organisational structure is an example of a pure emergent structure. Considering adaptive organisational structures, there are also a good number of articles about the matrix structure that combines the deliberate vertical lines of control seen in a traditional hierarchal structure and the horizontal process lines that are evident in the more emergent organisational structures.

Of the four research areas mentioned: strategy, business processes, organisational structures and information systems, it is in the area of information systems that industry experts have made significant contributions in exploring and developing diverse architectures from the deliberate to the emergent and the deliberate-emergent. However, their focus is mainly about the technical issues and

the management of the information system that support the deliberate approach. This is changing to some extent, however very little management literature or theory or concepts have been used to support the more advanced architectures.

More recently, industry experts and academics have been researching and writing about emergent information systems albeit to a far lesser degree than the amount of literature on deliberate information systems. In terms of literature on the adaptive information systems, there is some literature on the topic but most of it is to be found in industry publications. From a practice perspective, traditional information systems do support a deliberate approach. However many newer technologies and systems are tending towards an emergent approach. Here again, the space to be is designing, implementing, deploying, and executing an information system that supports adaptive strategies, processes, and structures (Figure 2). Unfortunately, most of the information systems offered by leading vendors, such as SAP and Oracle, do not subscribe to any particular theoretical underpinning. Both the vendors and the customers who purchase these systems are capable of following the adaptive approach but there is no coherent theory available to guide either their implementation or future evolution.

Finally, there are no roadmaps that would enable organisations to translate adaptive strategy into adaptive business processes, a relevant organisational structure, and how to support these with an adaptive information system. While some literature exists on the support of emergent strategies with appropriate organisational structures (Mintzberg, 1983) there is no literature on roadmaps and/or best practices that will enable the seamless translation of adaptive strategies into adaptive processes and structures, supported by appropriate adaptive systems. As well as these shortcomings, there is nothing to guide the practitioner in how to monitor and control this integration of adaptive strategy, business processes, organisational structure and the information system that supports them on an ongoing basis. There is some available information about how BP can be supported by adaptive systems there is nothing that considers, or directs how to manage all four elements of strategy, business processes, organisational structure and information systems in an interwoven reinforcing fashion.

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