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THE CHANGING CHARACTERISTICS OF INFORMATION DURING IST STRATEGIC DEVELOPMENT AND ENACTMENT

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Abstract

The development and enactment of IST strategies is of paramount importance for organisations. As IT becomes more deeply embedded into business processes the role of the IST strategy requires constant attention and development. However, many organisations still struggle with the development and enactment of their IST strategy which can lead to large over-runs in budget & time and a technology platform not supporting the business strategy. The research presented within this paper utilises established models to map and investigate the strategic development and enactment of an IST strategy in a case organisation over an eighteen-month period. The results of this research – which are part of a wider three year research program – illustrate that the complexities of inter-dependent levels of activity, evolutionary information characteristics and various levels of appreciation all affect the ability of an organisation to development and enact their IST strategy

Keywords: Strategic development, information evolution, appreciative settings, strategic enactment

Introduction

Information Systems and Technology (IST) strategies are critical to an organisations strategic development, as they provide the template for integrating Information Technology (IT) into business processes. However, fulfilling this task has proved highly problematic. Both academics and senior management alike have sought to address the issue of the strategic development of IST using a raft of techniques and models but with limited success. As IT becomes increasingly integrated into business processes then the evaluation of IT dependent business initiatives needs to reflect both the technical and organisational issues involved. No longer can the problem be delineated and treated, as a technical issue subservient to business needs. The problem is exacerbated even further by the fact that IT, and the means by which it can be made available to organisations are subject to continuous and rapid change. This change may or may not prove to be significant to any given situation but it cannot be ignored and needs to be investigated. In short, the concepts underpinning the development and enactment of IST strategies are ill matched to the complexities experienced in organisations. Although insightful contributions have been made to the IST strategy domain by authors such as Galliers (1991, 1999), Galliers and Baets (1998), Earl (1993), Ciborra and Jelassi (1994) and Doherty et al (1999) there is still much to discover about IST strategy development and enactment.

The research presented within this paper is part of a three-year research program being conducted at Lancaster University by the two authors with seven collaborating case organisations. Stage one of this research (2000-2001) was a pilot study that tested some of the key issues within IST strategy development and enactment. Stage two (2001-2002) focused on a selection of key areas identified in stage one. Results of both stage one and two, illustrate that IST strategic development is a complex, iterative process to undertake and incorporates a degree of uncertainty created by new technologies for the organisations involved (Brown and Robinson, 2001a; and Brown and Robinson, 2001b; Robinson and Brown 2002a; Robinson and Brown 2002b). The research presented in this paper forms part of the final phase of this research program and focuses on a detailed account of one of the case organisation's attempt at developing and implementing their IST strategy over a 18-month period. The structure of the paper is

as follows. Firstly, the research will be placed in context. Following this, a brief insight into the intellectual framework will be discussed. This will then lead onto the case analysis and the final conclusions, which will summarise the paper.

Context

As IT becomes more deeply embedded into business models and processes, its role becomes more crucial to an organisations success. For IT executives and strategists this increased dependence on IT - within both the existing business processes and the new IT dependent business models, such as e-business – creates a complex situation where there is a need to sustain existing systems but also to develop new IST approaches. The complexities faced by organisations are therefore formidable and ever changing. Failures due to technology, flawed systems development, poor choice of application or combinations of these can have major implications for organisations. In the U.K. the list of organisations that have suffered major IST disasters is a long one – The Stock Exchange, The Department of Vehicle Licensing, The Aviation Authority and The London Ambulance Service – are just a few high-level profile examples from recent years. But the U.K. is not alone in this; other countries have their own list of major IST failures.

Intellectual Framework

Undoubtedly, strategies walk on two feet – one deliberate and one emergent (Mintzberg, 1987). The deliberate foot can be classified as the strategic intent of the strategy. The emergent foot is then the aspect of change and adaptation required by the organisation as they attempt to move towards their strategic intent as the strategy unfolds. However, as noted by Webb & Pettigrew (1999), there is a tendency in the strategic literature to focus on strategy typologies which only depict strategy in static terms. Strategic research therefore tends to be ahistorical, aprocessual and acontextual (Pettigrew, Ferlie & Mckee, 1992 and Pettigrew & Whipp, 1991). Ideally strategic development is best made sense of when it is observed longitudinally. The resulting strategic formulation and re-formulation can usefully be viewed from three inter-related dimensions – process, content and context (Pettigrew, 1988).

This processual view of strategy enables the researcher to examine IST strategy as an unfolding organisational process driven by individuals and groups. In the processual view, strategy process is defined as how strategies come about, including decisions and actions taken by the actors involved. Strategy content is then defined as the objectives/outcome of the strategy. Finally, strategy context is defined as the set of circumstances that influence process and content. Being able to view strategic development from a processual perspective is crucial when we consider the dynamics of IST strategy development, for example, this view allows a degree of structure towards the area of concern, for example:

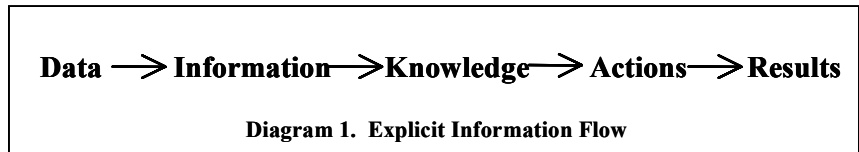
- Process can be utilised to observe:
 - The types of planning approaches used
 - Timings of IST decisions (past, present and future)
 - Initiation of new IST initiatives
- Content can be utilised to observe:
 - The high-level architectural considerations
 - The direction of the portfolio of IST initiatives
 - Criteria for business/IST alignment
- Context can be utilised to observe:
 - Changing business requirements
 - Evolving IST capabilities
 - Effects of architectural decisions

All the above areas have been discussed in various forms in the IST literature. What the processual perspective offers is a way to integrate these areas. Therefore, instead of viewing organisational actions as fixed elements within the decision making process (Checkland and Casar, 1986), a more subjective, interpretative stance is required. Vickers appreciative model and Boisot's I-space model, are two such models that can help structure insights into some of the more subjective aspects of IST strategy development and enactment, and compliment the processual view of strategic development. Having established the high-level processual framework, the remainder of this section will now focus on the models used to interpret the case organisation.

In Vickers work (1968 and 1963), the foundation of the appreciative system is that actors are continually appreciating reality and making judgements about that reality as time develops. This appreciation can be characterised as two strands of rope, which represents the interacting flux of events and ideas within an organisation. Essentially, the appreciative system stays the same, but the content and contexts that surround the appreciative system will change. As the flux of events unfold, the decisions, actions and ideas, which unfold, will impact on and change the flux of events. This process unfolds continuously and both ‘strands’ affect each other. This cyclical process of events driven by individuals will affect their own actions, decisions and ideas, and also those of other individuals.

This constant process of appreciation will occur at various levels throughout the IST strategy development and enactment phases. Not only will the strategists be exposed to and in turn influence their appreciative setting but this process will occur at the lower levels of the organisation as well.

Throughout the process of developing and enacting the IST strategy there maybe a constant interaction of these appreciative settings as information moves between the organisational levels. Therefore, in any strategic development and enactment, information will play a crucial role in determining how the re-orientation takes place. As Quinn (1978) argues, it is almost impossible to predict all events at the beginning of the strategy process. New information will become available as the process unfolds. As Ward (2002) notes, the traditional view of information flow in an organisation is movement from Data through to Action/Results, as illustrated in the diagram.



This model of information flows provides an excellent account of structured, operational views of an organisation. In that, to perform a certain explicit task, the actor has to identify the task, understand it and then perform it. However, strategic development – and especially IST strategy development and enactment – is never that simple and straightforward. As Ward (2002) notes, during strategy development we have to step outside this linear view and in fact the information flow maybe more complex and richer than the prescribed approaches in the orthodoxy.

To understand the role of information in more depth and how it evolves within the strategy process we can utilise the work of Boisot (1995 and 1998). Boisot’s work is based around the concept of the I-space (or information space). At the basis of this concept is the distinction between data, information and knowledge, as follows:

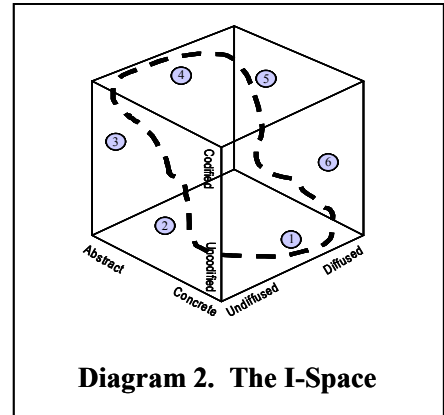
- Data – discernable difference between alternative states of a system
- Information – data that modifies the expectations or conditions of an observer
- Knowledge – set of expectations that an observer holds with respect to an event

Data, information and knowledge all have fundamental roles to play in IST strategy development and enactment as they enable a learning experience that blends the gradual accumulation of experience with discontinuous insights (Boisot, 1998). However, with the massive amounts of data available to the actors involved in strategic reorientation – inside and outside the organisation during the strategy development and enactment processes – actors need to be able to economise, modify and manipulate this data. Boisot argues that researchers can observe this by utilising the I-space as an analytical tool. The I-space comprises three main dimensions within which information evolves and changes as the strategy processes unfold, as follows:

- Codification – Codification aims to reduce the uncertainty which is present in data (although this may happen naturally over-time). To reduce uncertainty the data moves along the codification dimension from complex data to simple data, from inarticulate to the articulate. Essentially, the un-codified data becomes codified as the idea is assigned structure and coherence when being developed by the individuals. The success and efficiency of this process is dependent on the complexity of the data and the experiences of the individuals involved.
- Abstraction – The movement along this dimension aims to tease out the underlying structures which are relevant to the purpose being sought. Abstraction reduces the number of attributes that need to be codified and helps to discern the structures that underlie the forms. Abstraction therefore runs closely with codification. When data moves along both dimensions the information becomes more articulate and shareable.

- Diffusion – This, as Boisot notes is the most complex process of all. The movement along this dimension establishes the availability of data and information for those who want to see and use it. It is not about how other actors adopt the data and information but how it is made available. Movement along this dimension moves from un-diffused to diffused.

The I-space (see diagram 2) is therefore a conceptual framework within which the behaviour of information can be explored during strategy development and enactment. As movement along all the dimensions occurs, data will be shredded because it is of no use to the actors involved – whilst other data becomes more critical to the process. A general pattern of data development is put forward by Boisot, called the Social Learning Cycle (SLC). This cycle represents data development along the codification and abstraction dimension, which allows for the data to be diffused amongst organisational actors – as illustrated opposite. The I-space strength lies in its ability to offer a framework for analysing the production and distribution of information in a social system, in this case IST strategy development and enactment. Boisot’s model therefore aims to capture the dynamics of the strategy development and enactment processes. As Boisot (1998), notes, the fluidity of boundaries that demarcate an organisation from its technologies and products calls into question the viability of strategic frameworks whose analytical power depends on static boundaries.



Case Organisation

Company X is a global insurance business. The company is over 50 years old, employs over 40,000 people around the globe – mainly UK based – and has a turnover of approximately £2.5 billion. The business is structured divisionally with each of the main business divisions being supported by a corporate structure, incorporating centralised support areas such as Human Resources and Information Systems. In order to provide global IST services to all business divisions the IS department is segregated into the key IST services ranging from project management through to systems development and architecture management. All business divisions are allocated a dedicated IS Account Manager who provides the integration between the IS department and the business divisions.

The IST strategy is developed as a key-enabling component of the overall business strategy and comprises the main streams of IST activity over the short, medium and long-term; as well as highlighting the overall service and infrastructure management provisions. Annually – between January and March – the IS department will undertake a strategy reorientation phase. The output of this phase is the production of the annual strategy document, which documents the key streams of IST activity currently being undertaken now and in the future (maximum 5 years). The informational inputs into this phase come from a variety of sources:

- From initiatives being developed throughout the year in order to meet the changing business requirements.
- During the IST strategy reorientation phase, new ideas/innovations can be developed and will be incorporated into the overall stream of activities.

Upon completion of this phase, the formal business strategy setting phase then commences – March to June – which adopts the same philosophy as the IST strategy setting phase but focuses on the main business strategy streams of activity (which generally incorporate IST components). Following the completion of the business strategy phase the IST document can be amended in order to incorporate new changes and requirements.

Throughout the year (and including the strategy setting phases) the IST and business strategies are enacted within the organisation through the development and implementation of new systems and business processes. During the time spent within the case organisation, two major strategic initiatives were observed. The first of these is a new insurance administration system. Following rapid business growth over the preceding years, the existing insurance application system was starting to show signs of weakness. For a number of months, the senior management within this division had been receiving information from various sources about major problems with the existing insurance application system. A decision to replace the existing system was taken by the Managing Director of the business division and was outside the formal IST strategy reorientation phase. The initial concern towards the problems were fairly operationally based and focused on the lack of functionality of the legacy system. However, as the ideas developed, two major issues were also highlighted:

- In order to ensure future growth of the business division, a standardised application portfolio would be required.
- In order to meet future business needs, the new system would require extensive flexibility.

Once the decision to proceed was taken (by the Managing Director of the business division), the initiative was then integrated into the overall IST strategy. Due to the requirements of this system, the integration into the strategy meant a major IST reorientation was required for this business division, as this initiative became a major stream of IST activity – approximately £10 million.

At the commencement of the initiative, the solution was only being discussed in conceptual terms. Although the intent was known, the ability and mechanisms needed to deliver this intent were extremely vague. As the initiative developed, major issues of lack of certainty and scope became apparent. Throughout the initiatives development, major phases of work required redefining and recommencing as they had gone seriously out of scope and budget. As these phases of reorientation occurred it became apparent that the initiative was too focused towards the high-level conceptual aspects and not the more explicit systems development issues required to deliver the initiative's intent. It took a major reorientation for the senior management to realise that the focus of the initiative was not delivering the solutions required. To date, the core systems have been implemented; thus creating the standardised application platform but the business flexibility has not been delivered. This business intent is now being developed through a new extended phase of the initiative.

Initiative two again focuses on a major IST initiative developed and implemented within another business division within Company X. This initiative aims to replace a series of manual business processes used to authorise and initiate direct debit mandates, by integrating Company X's system with the UK's central banking clearance house. Again, on the surface, this initiative seems an operational issue. However, the new system would have a major strategic impact on the organisation. This form of payment generates at least 80% of this business division's income and it is therefore crucial for an effective and efficient process. This was a major initiative for the business division and had a strong business case from the start as it would not only create a more efficient business process and ensure income is captured at source.

The main phase of this initiative generation coincided with the formal IST strategy reorientation phase but was developed outside the formal processes. The issues/problems associated with the existing manual system had been apparent for many months. However, for the majority of this time the focus was on a simple improvement of operational needs. It soon became apparent that the potential savings and strategic value from implementing an automated system would be immense. The initial costs were expected at £500,000 with an expected return on investment within 18 months.

For the business division concerned this was a major undertaking for them and resources were allocated and systems development work commenced immediately. Even though the initiative scoping was unfolding, the main focus from the business senior management was just to implement the solution as quick as possible. This attitude placed pressure on the development team and throughout the development phase the focus from the business was not the operational requirements of delivering the system but just on the desired business state. This meant that as the initiative developed, it took a considerable amount of time and resources to refine the actual system and deliver the intent required. This meant that the initiative underwent a series of reorientations in order to deliver a solution that would enable the business value to be delivered. Since its conception, the costs of this initiative have doubled. However, following implementation the desired business intent has been delivered by the initiative and the expected ROI is now approximately three years.

Discussion

It is clear within Company X that there are various streams of activity occurring that leads to the development and enactment of their IST strategy (the process of strategy). At the abstract level, we can segregate these streams of activity into three main areas being the formal strategy setting phase, formalisation and development of initiatives throughout the year. Senior management conduct the formal strategy-setting phase over a specific time-period each year. The aim of this phase is to set the high-level intent of the strategy and the accompanying initiatives that are used to enact this strategic intent (determining the strategic intent/strategy content). These initiatives are either carried over from previous years or new initiatives that have been decided upon during this strategy setting phase. Throughout this phase, senior management are constantly appreciating what is happening in and around the organisation (strategy context) and then making judgements about what direction the organisation must take. Ultimately, the action taken is reflected in the choice of direction taken by the decisions made. However, following the completion of the formal IST strategy setting phase new initiatives can commence at anytime of the year. At the strategy setting level and formally at the strategic initiative level there is an iterative cycle to ensure the IST platforms are aligned with the business needs – both strategically and operationally. Table 1 illustrates the main processual aspects observed within the case organisation over the eighteen-month period.

Table 1. Processual Aspects Observed

Phase	Context	Content	Process
Initiation			
Formal Processes	- Competition, business and IST needs - Legacy systems	- IST strategy enables business strategy through iterative development - IST Legacy	- Selection of key individuals involved in consolidating and developing the key data - Little diffusion data
Initiative One	- Initially operational issues which were developed into strategic issues	- No consideration of technical nor architectural issues - Mainly justified from a business perspective	- Decisions made by a select few individuals - Conceptual thinking only with little data development
Initiative Two	- Initially operational issues which were developed into strategic issues	- No consideration of technical nor architectural issues - Mainly justified from a business view	- Decisions made by a select few individuals - Conceptual thinking only
Formalisation			
Formal Processes	- Internal and external resource availability - Integration into IST strategy	- Integration into the main strategic themes - Built in slack for reorientations	- Data movements now more structured and focused towards commencement - Generally little diffusion
Initiative One	- Integration into the IST strategy	- Major IST strategy reorientation required	- Conceptual data used to formalise the initiative
Initiative Two	- Little consideration of resources as main focus on delivery	- Not a major reorientation required but still required integration	- Conceptual data used to formalise the initiative
Implementation			
Formal Processes	- Resource availability, team & initiative structure, technical development and formal review requirements	- Strategic objectives requiring transformation into IST systems - Capability to allow for change and flexibility	- Lower level, operationally focused data movements – more rapid and diverse - Concentrate on averting blockages of movement
Initiative One	- Technical issues influencing initiative - Resource management	- Unable to transform strategic objectives into systems - Major technical issues - Strategic objectives not met	- Lack of codified data being developed - Constant reorientations to overcome problems
Initiative Two	- Technical issues influencing initiative - Resource management	- Unable to transform strategic objectives into systems - Major technical issues - Strategic objectives not met	- Lack of codified data being developed - Constant reorientations to overcome problems

The main purpose of the strategy setting phase is to articulate the high-level direction and agenda of the IS department activities and the role of IT within the business strategy, which are required to meet the IST strategic intent. Throughout the processes' information is being obtained from various sources, including individuals from within the IS department, the business areas and external vendors and suppliers. In informational terms there are clearly various flows of information evolving as the individuals involved set and enact the strategic intent. Each of these flows of information is quite distinct in nature and evolves differently as the phase unfolds. Fundamentally, the high-level information flows and appreciative processes/settings of the strategy setting phase provide the foundations for the enactment of the IST strategy throughout the year. What we see is a high-level abstract stream of activity/appreciative setting/information flows – being the strategic intent – which is populated with lower level IST initiatives, creating smaller streams of activity. It is this portfolio of initiatives, which enables the strategic intent to be delivered.

As the enactment processes unfold new initiatives can be commenced – as in the two examples highlighted earlier. What is evident in this case organisation is the distinct characteristics of the formal processes against what is actually unfolding in the strategic

initiatives. The formal development of the IST strategy tends to adopt a fairly structured approach whilst the strategic initiatives are fairly unstructured and uncertain. However, in order to incorporate these ideas in the IST strategy and deliver an effective system, they have to be made more explicit and generalised within the organisation. A process which did not unfold in the two strategic initiatives.

Clearly the strategic impetus for the two initiatives was great and focused mainly on the business concepts. In the case of initiative one, this caused a major IST reorientation and its subsequent development was plagued with problems. Initiative Two did not have such a huge impact the IST strategy, but again its development was plagued with problems. To deliver both initiatives, they underwent major reorientations as new information and experiences led to a better understanding of the situation unfolding. Although problems/issues experienced at the initiative level can be overcome, they will ultimately affect the enactment of the high-level IST strategic intent. Ensuring a fluid process at all levels of strategy development and enactment is crucial in ensuring that the strategic intent – which may have been adjusted along the way, as new initiatives commence – is delivered. One way of assisting this process to happen is to control the development and delivery of the strategic initiatives via formal control mechanisms therefore ensuring that data and information movements are more structured and cohesive. However, as illustrated in both strategic initiatives these control mechanisms can be ignored and bypassed if other pressures exist – such as rapid delivery of strategic intent.

Practical Implications

Although this paper only provides insights into one case organisation over an eighteen-month period, a number of initial practical implications can be drawn from this research. However, it must be noted that the research presented within this paper is part of a wider research program where in fact seven case organisations have been engaged with and therefore the results of the wider research program will now be more conclusive. Therefore caution must be taken when digesting the following practical implications, as the main research program is still ongoing. However, the main implications from this paper are as follows:

- Formal strategic processes can be overridden in order to commence strategic initiatives. However, concern must be taken to ensure the initiatives concept considers and can be legitimised for both technical and business implications.
- Although the delivery of the strategic intent may evolve and change throughout time, care and consideration must be placed on ensuring that new initiatives are capable of delivering their strategic intent otherwise there is an obvious knock-on effect with the IST strategy.
- Commencing strategic initiatives based on decisions made without sufficient structure can be a risky approach to take and can invariably impact on the development of the actual initiative as it unfolds during systems development cycles.
- Ensuring both technical and business information develops in cohesion at the initiative level is crucial for not only ensuring alignment of the initiative but also to ensure the more operationally explicit systems development needs can be met.
- The focus of strategic initiatives can vary from conception through to implementation. Although the demands of the business may be fairly operationally focused, an initiative commenced to fulfil these needs may take on a more strategic focus in order to gain business/technical support and acceptance.
- Strategic objectives (either at the abstract level or within the portfolio of initiatives) must be transformed into more operationally focused systems development capabilities in order to deliver the desired intent.

As mentioned above, the implications highlighted in this paper are only based on evidence obtained from one case organisation. However, the experiences observed from Company X still illustrate an extremely complex and multi-disciplinary process unfolding which eventually leads to the enactment of the intended or adjusted strategic intent.

Conclusion

To conclude, it is evident from the case insights that IST strategy development and enactment is still a complex task to undertake. The strategic initiatives and processes discussed in this paper illustrate a high-level of complexity and uncertainty. Establishing the IST strategic intent through formal processes is of paramount importance, as it establishes the abstract IST and business alignment capabilities and sets the IST agenda. However, delivery of this intent is highly dependent on the organisations ability to manage and enact the portfolio of IST initiatives, which unfold throughout the year. Without a doubt, it is the portfolio of IST initiatives, which ultimately determines the ability to deliver the desired – or adapted – strategic intent. For business, the acknowledgement of this complexity is required as developing and enacting the IST strategy is no longer just a technical issue

isolated to the IS Department but is in fact an organisational wide issue. In summary, number of key learning points can be drawn from this paper:

- IST and business alignment is just as crucial at the initiative level as well as the strategic level.
- Various levels of activity lead to the development and enactment of the IST strategy.
- The nature of how people interact and take action within the various levels and phases of activity is key to ensuring the strategic intent is delivered
- New IST initiatives can commence throughout the year and may ultimately lead to a IST strategic reorientation
- Strategic development and enactment is not just concerned with the high-level abstract perspective of an organisation, but must be reflected at the initiative and systems development levels

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