

2008

Agility in Information System

Brett Woolley

Oakton Melbourne, Victoria, Brett.Woolley@oakton.com.au

George Hobbs

Department of Information Systems University of Melbourne Melbourne, Victoria, gahobbs@pgrad.unimelb.edu.au

Follow this and additional works at: <http://aisel.aisnet.org/acis2008>

Recommended Citation

Woolley, Brett and Hobbs, George, "Agility in Information System" (2008). *ACIS 2008 Proceedings*. 84.
<http://aisel.aisnet.org/acis2008/84>

This material is brought to you by the Australasian (ACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ACIS 2008 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Agility in Information System

Brett Woolley
Oakton
Melbourne, Victoria
Email: Brett.Woolley@oakton.com.au

George Hobbs
Department of Information Systems
University of Melbourne
Melbourne, Victoria
Email: gahobbs@pgrad.unimelb.edu.au

Abstract

This paper focuses on agility in information systems, and how the IT function can enable this capability. An IT consultancy provides insights into agility from observations of its entire client base, a broad cross-section of industries and types of organizations. The IT consultancy's observations include factors that: determine the relevance of agility in information systems to an organization; enable an IT function to leverage the existing information systems for emerging opportunities; and intervene in the IT function's enablement of agility. The paper is the result of a Delphi-like study between practitioners from the IT consultancy and IS researchers. It illustrates how research and practice can inform a high-ranking management concern. The paper proposes the IT function is more likely to leverage existing information systems with an investment into the maturity of particular capabilities, and that different IT governance models can drive or confound the enablement of agility.

Keywords

Agility, IT function, Information Systems, Descriptive research

INTRODUCTION

Oakton is a Melbourne-based IT consultancy. The paper describes Oakton's current thinking on the topic of agility in existing information systems, and on the specific question of how IT personnel and their work processes can leverage the existing information systems for emerging opportunities.

Oakton's thinking on agility is drawn from their Enterprise Strategy and Architecture consultancy's observations of a range of client organizations. Oakton has approximately 300 active clients that include a broad cross-section of industries and types of organizations. They range from major banks to small "not for profit" semi-government support organizations. The client base spans the commercial and public sectors across Australia, with a focus on the eastern seaboard states. The Department of Information Systems at the University of Melbourne has provided content by defining the discussed concepts in light of current IS research.

IT professionals are increasingly concerned with agility in information systems. As a management issue, agility was ranked first in a recent survey of Chief Information Officers of large US-based organisations (Ives and Mandviwalla 2004). The traditional approach of information system change acquired through long-range planning is less timely in today's highly competitive, global marketplaces; and may constrain innovation (Baskerville 2006). The organizational capability of agility addresses this problem by sensing the business environment to forecast change, and responding with options to adapt existing information systems (Luftman and McLean 2004; Newman 2005).

This paper informs IT professionals in a number of ways. First is how to recognize the relevancy of agility to their organizations. Second, what their role in leveraging existing information systems is. Last, how IT governance may drive or confound their enablement of agility.

Scope

The information systems in scope for the paper are IT-conducted business initiatives. Information systems are considered comprised of three parts. First is the business component, which is constituted by the users and their work processes that are stakeholders in the business initiatives. Second is the information technology of implemented electronic processes and networks. Last, the IT function, which is the personnel and their work processes that have a responsibility for the delivery of information systems; and can be constituted from business representatives, in-house IT staff, external consultants, IT product vendors and service outsourcers.

Out of scope of this paper is a discussion of software and hardware technology. The information technology may vary from bespoke applications written in third-generation or object-orientated languages, to vendor-packaged enterprise applications; and have architectures varying from monolithic to web-service orientated. While the type of technology utilized is a determinant of agility in information systems, it is not within the scope of this paper. This paper's scope is the IT function which is necessary for information systems to be agile.

What is known about Agility in Information Systems

IS research and practice is subscribing to a common message of agility which consists of: recognition of a business environment that fluctuates quicker than conventional strategic planning cycles; the need to sense environmental fluctuations; the need to respond with options using existing information systems; and organizational readiness to effect the sensing and response (Luftman and McLean 2004).

Agility of information systems has received recent attention in IS research (e.g. Piccoli and Ives 2005; Sambamurthy et al. 2003; Weill et al. 2002). IS research discusses a new era where a firm's performance depends on IS agility, and less on identifying strategic IT investments (Galliers 2006; Peppard and Ward 2004). This IS research is synthesised into a basic model for agility in information systems. First, the IT function fuses business and technical knowledge to sense the environment; and respond with IT-enabled options for future needs (Sambamurthy et al. 2003). Second, the IT function senses current use of information systems, monitoring and improving the value realized (Overby et al. 2006).

Surveying the IS literature concerned with agility and the IT function, early contributions have defined concepts. Agarwal and Sambamurthy (2002) state that IT plays an important role in corporate agility. Desouza (2006) signifies agile organizations and agile information systems as the same thing. Lyytinen and Rose (2006) view an agility outcome of the IT function from an organizational learning perspective, and considers exploration and exploitation of innovative processes. Osborn (1998) analyses an agility paradox to be resolved by strategy, control and systems. Peppard and Ward (2004) present attributes of an IS capability for agility. Weill et al. (2002) correlate strategic agility and IT-infrastructure capability.

More recent contributions of IS literature explain the IT function capabilities that enable agility. Fink and Neumann (2007) correlate IT personnel capabilities and IT infrastructure capability, and IT infrastructure capability and IT-dependent organizational agility. Galliers (2006) suggests a strategizing framework for agile information systems. Overby et al. (2006) explore the underlying capabilities, explain the enabling role of IT, and propose scoring agility based on unspecified measures of sensing and responding. Sambamurthy et al. (2003) describe IT competencies to enable digital options which afford agility. Van Oosterhout et al. (2006) define the change factors requiring agility, and identify IT as both an enabler and inhibitor of agility.

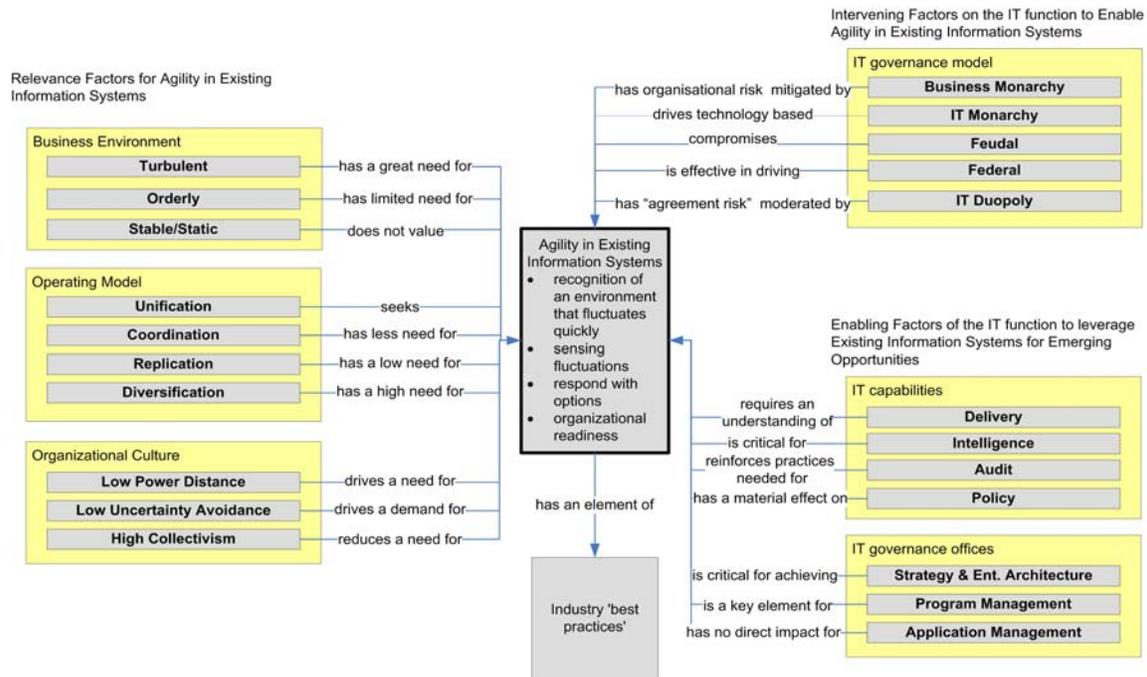


Figure 1: A Relational Model for Agility in Existing Information Systems

Outline

Following a description of the methodology, this paper discusses the factors observed by Oakton from its client base (see Figure 1). First discussed are factors that determine the relevance of agility in existing information systems to an organization. Second, factors that enable an IT function to leverage the existing information systems for emerging opportunities. Last discussed are factors that intervene in the IT function's enablement of agility in existing information systems.

The relational model contains factors (outer boxes); types within a factor (inner boxes); and the relationships of the factor types (arrows) to an outcome of Agility in Existing Information Systems (the centre box). The relationships are read in the direction of the arrow. For example the top-rightmost relationship in Figure 1 reads as "The IT governance model of Business Monarchy has organizational risk mitigated by Agility in Existing Information Systems". The paper will explain the factors and relationships contained in the model.

METHODOLOGY

A Delphi-like study was conducted, with the paper being the research object. This method of concept framework development begins with identification of a set of concepts and followed by further classification and development of those concepts (Okoli and Pawlowski 2004). The study was done in five stages. The first stage was to identify the factors of interest in a brainstorming session. This was an hour-long meeting with a senior manager and a manager of the strategy and enterprise architecture practice of Oakton, and the second author of this paper. The identified factors determine the relevance of agility in information systems to an organization, and enable the IT function to leverage the existing information systems for emerging opportunities.

The second stage of the study was the definition of factors. This included the introduction of concepts from the IS literature by the paper's second author. This resulted in the first draft of the paper. This discourse was conducted mostly electronically. The third stage was to understand the causal relationships between factors. This involved recording an Oakton manager's observations of factors' relationships to outcomes, based on generalizations from the client base. This resulted in the second draft of the paper.

The fourth stage of the study was to generate propositions. This was the result of discourse between this author and a manager of Oakton, and was conducted electronically. This was recorded in the second and third drafts of the paper. The final stage was further development of the factors and propositions by the reflections of twelve other consultants of Oakton. Their observations were included in the final version of the paper.

RELEVANCE FACTORS FOR AGILITY IN EXISTING INFORMATION SYSTEMS

Oakton believes that the main factors for the relevance of agility in information systems are: the business environment; the operating model; and the organizational culture. We discuss the different types within each of these factors, and Oakton's observations on whether each type adds to or subtracts from the organization's need for agility. Following is a discussion of each identified factor.

The Business Environment

Oakton has identified three types of business environment, in the context of the relevancy of agility in existing information systems to the organization: Turbulent; Orderly; and Stable/Static. These types describe the degree of environmental fluctuation. An organization usually only exists in one of these environment types for any period of time. Changes are usually caused by material events.

Turbulent

In the Private, Commercial and Financial sectors, Oakton has observed that organizations have a much greater need for, and value recognition of, agility. This has been driven by a systemic need to be able to adapt and change to either meet competitive pressures or to seek competitive advantages. This has grown in importance as information systems have become an instrument of differentiation in a much greater variety and number of industries. The relationship in Figure 1 is "A Business Environment that is Turbulent has a great need for Agility in Existing Information Systems".

Orderly

In many industries, where operational shifts are only done in planning and budgetary cycles, the business environment values agility but it is not seen as a fundamental competency. An example is a government department. Oakton's observations are that these organizations tended to value cost efficiency over agility. The relationship in Figure 1 is "A Business Environment that is Orderly has limited need for Agility in Existing Information Systems".

Stable/Static

In regulated monopolies, the ability to rapidly change is typically not valued as service delivery and cost efficiency are the greater focus. Indeed Oakton has observed that seeking agility has been counter productive in some instances. This is because the organization is not interested in understanding the trade-offs involved in enabling agility in both the technology and the IT function. The lack of drivers does not promote thinking to enable the appropriate level of agility to be achieved with its associated increase in costs. The relationship in Figure 1 is "A Business Environment that is Stable/Static does not value Agility in Existing Information Systems".

The Operating Model

The operating model of an organization can be described as the necessary level of business process integration and standardization for delivering goods and services to customers. This established description organizes these dimensions of 'integration' and 'standardization' into four types of operating model, and associates a key IT capability with each type (Weill et al. 2006). The four types of operating model are: Unification; Coordination; Replication; and Diversification. An organization usually only conforms to one of these operating models. Following is a discussion of these operating models and Oakton's observations relating to each model.

Unification

Organisations that fall under the unification model have high business process standardization and high business process integration. Organisations under this model have a single business with global process standards and global data access. The IT capability key for these organisations is enterprise systems reinforcing standard processes and providing global data access.

Oakton has observed that unification based organizations have sought agility across the domain because of the breadth of impact across the enterprise for change. This means that change in any area needs to be carefully monitored and measured across the other areas of the business. The relationship in Figure 1 is "The Operating Model of Unification seeks Agility in Existing Information Systems".

Coordination

Organisations with the coordination model have low business process standardization and high business process integration. These organisations have unique business units with a need to know each other's transactions. The IT capability key for these organisations is access to shared data through standard technology interfaces.

Oakton has observed that organizations with this operating model have less need for managed agility as they tend to have good process boundaries that can compensate for the ability to adapt systems. This lesser need is true for the smaller business units in a coordination operating model, but the need for agility increases in the larger business units. The relationship in Figure 1 is "The Operating Model of Coordination has less need for Agility in Existing Information Systems".

Replication

Organisations that exhibit the replication model have high business process standardization and low business process integration. Organisations with this operating model have independent but similar business units. The key IT capability is to provide standard infrastructure and application components for global efficiencies.

Oakton has observed that these organizations have a low need for agility as each of the businesses tend to operate their own model. This means that while there is often change, the corporate infrastructure stabilizes the common elements reducing the need for high agility. The relationship in Figure 1 is "The Operating Model of Replication has a low need for Agility in Existing Information Systems".

Diversification

Organisations that display the diversification model have low business process standardization and low business process integration. These organisations have independent business units with different customers and expertise. The IT capability key for these organisations is to provide IT-resource economies of scale without limiting independence of the business units.

Oakton has observed that these organizations have a high need for agile information systems because of the focus on supporting a variety of businesses. The agility is more focused on infrastructure rather than applications which tend to be business unit specific. The relationship in Figure 1 is "The Operating Model of Diversification has a high need for Agility in Existing Information Systems".

In summary, Oakton believes that those organisations that exist in industries that are facing an ever changing business environment demand a greater level of IT agility that those organisations that exist in orderly or stable/static environments.

The Organizational Culture

Organization culture as a relevance factor for agility is levelled at the entire enterprise, of which the IT function is a subset. The following is an updated interpretation of an established set of cultural dimensions for IT-focused organizations (Crozier 2000): Power Distance; Uncertainty Avoidance; and Individualism-Collectivism. An organization may be assessed by one or many of these cultural dimensions.

Power Distance

The first cultural dimension for organizations is the distribution of decision-making power that is accepted. A low Power Distance de-emphasizes the association between organization members' position and decision-making power. Decision making is decentralized and more likely to span organizational boundaries. High Power Distance in organizations is more likely to follow a hierarchical system that does not allow decision-making amongst most members and across organizational boundaries.

Oakton has observed that low power distance drives a need for agility due to breadth of impact and the more "capability" based decisions which tend to demand more flexibility. However, Oakton has also observed that occasionally high power distance also supports the need for agility due to the increased speed of decision-making enabling wider, more reactive and flexible change. High power distance leads to a need for agility when combined with a turbulent business environment. The relationship in Figure 1 is "An Organizational Culture of Low Power Distance drives a need for Agility in Existing Information Systems".

Uncertainty Avoidance

The second cultural dimension is the level of tolerance for uncertainty and ambiguity. A low Uncertainty Avoidance is reflected in an organization that is less procedure-bound and less able to manage change. A high Uncertainty Avoidance creates a rule-oriented organization that institutes procedures to manage change.

Oakton has observed that low uncertainty avoidance requires agility to a greater degree than organisations that have high uncertainty avoidance cultures. This has been fundamental because change is more likely to be demanded in a low uncertainty avoidance culture. Interestingly, Oakton's experience is that the higher the uncertainty avoidance, the more controlled the changes and this, at times, increases the ability to change (even if it reduces the propensity to do so). The relationship in Figure 1 is "An Organizational Culture of Low Uncertainty Avoidance drives a demand for Agility in Existing Information Systems".

Individualism-Collectivism

The final cultural dimension for organizations is the degree to which individualist or collectivist relationships are reinforced. High Collectivism closely ties individuals within a group. Everyone seeks consensus from fellow members of their group. These closely-bonded groups may be introspective and less inclined to share knowledge across organizational boundaries. High Individualism indicates that individual independence and responsibility are dominant within the organizations. Individuals may tend to form a large number of loose relationships outside of the immediate group, and facilitate sharing of knowledge across organizational boundaries.

Typically it has been Oakton's experience that high collectivism slows decision-making and hence reduces the need for agility. The time used to get consensus can be utilized to prepare and plan changes on a case-by-case basis (as opposed to a systemic built-in agility). The relationship in Figure 1 is "An Organizational Culture of High Collectivism reduces a need for Agility in Existing Information Systems".

ENABLING FACTORS FOR THE IT FUNCTION TO LEVERAGE EXISTING INFORMATION SYSTEMS

Given the relevance of agility of information systems to an organization based on its business environment, operating model and culture, Oakton has identified some enabling factors to leverage existing information systems. These enabling factors are a set of capabilities of the IT function, and the governance framework that surrounds these capabilities.

IT Function capabilities

The IT function's capabilities are suggested from an established model of what is necessary and sufficient to adapt a system within a fluctuating environment (Beer 1970). These capabilities are: Delivery; Audit; Intelligence; and Policy.

Performance of these capabilities can be dispersed throughout the IT function, and include business unit representatives, in-house IT staff, external consultants, IT product vendors and outsourcers. Individual roles can vary from providing consultancy recommendations to direct responsibility for exercising the capability. The

paper will discuss how to identify who performs these capabilities in the IT function, some of their constituent tasks, and Oakton's observations on their effect on agility in existing information systems.

Delivery

The Delivery capability can be identified in the IT function by asking "Who has direct responsibility for the 'inside and now' control of the implemented electronic processes and networks?" The capability includes the tasks of: sourcing the plans and schedules for the information system adaptations; monitoring the operation of each information systems; and monitoring the coordination of the information systems.

Oakton has observed that the Delivery capability must have a solid understanding of what is required to achieve agility and the dimensions of agility required in the future for the organization. The Delivery capability needs to plan agility into both the processes to develop systems and the technical solutions devised. The relationship in Figure 1 is "The IT capability of Delivery requires an understanding of Agility in Existing Information Systems".

Audit

The Audit capability can be identified by asking "Who has the responsibility for any sporadic audit?" The audit capability includes incidences of: ensuring that directions to the information systems are being performed as reported; filling in possible gaps in reporting; and making special case assessments of operations of the information system.

Oakton has not observed a significant relationship between the Audit capability and agility. There is a perceived relation about good discipline that Audit helps to encourage agility, but it is more an indicator than a prerequisite. The relationship in Figure 1 is "The IT capability of Audit reinforces practices needed for Agility in Existing Information Systems".

Intelligence

The Intelligence capability can be identified in the IT function by asking "Who spends most of their time looking to the environment and the future?" The intelligence capability includes the tasks of: maintaining a model of the information systems and the environment; gathering data from the environment and the internal operations of the information systems; probabilistic modelling of future events to predict how the information systems will react; and proposing structural changes to the information systems.

It is clear in Oakton's observations that agility comes via desire and planning. The degrees of freedom required needs to be planned across the people, processes, technology and culture of organizations. The role of the intelligence in understanding the dimensions of change needed are critical to actually achieving an agile IT environment. The relationship in Figure 1 is "The IT capability of Intelligence is critical for Agility in Existing Information Systems".

Policy

The Policy capability can be identified by asking "Who sets the overall goals and constrains the possibilities of adaptation?" The policy capability includes incidences of: Producing policy to govern the behaviour of the information systems; Intervening in the Intelligence-Delivery interaction; and Thinking about what is being produced and why?

Oakton has observed that the policy capability has a material effect on the agility of the organization, during policy planning, framing and enforcement. Oakton has observed two facets of this effect. One is the support for agility by the nature and styles of its policies; and the other is the support by the way it adapts the actual policies to changing circumstance. The relationship in Figure 1 is "The IT capability of Policy has a material effect on Agility in Existing Information Systems".

IT Governance Offices

The following are the offices of the IT function that Oakton sees as necessary for a practical framework of good IT governance: Strategy and Enterprise Architecture; Program Management Office; and Application Management Office.

The accountabilities of these offices are not the direct management of IT resources, to detail a program of business initiatives, or the delivery and running of the enabling IT. The consideration given to these IT governance offices, in this paper, is their decision rights that are particular to leveraging existing information systems for emerging opportunities. An IT function should have all of these offices.

Strategy and Enterprise Architecture

The decision rights of the office cover: aligning business and IT strategies; monitoring benefit realization; translating strategy to operational programs; prioritizing initiatives for delivery; and communicating with strategy

stakeholders. Deliverables of the office include: identified IT trends and opportunities; approved current and target enterprise architectures; and transition roadmaps.

As noted, it is clear in Oakton's observations that agility comes via desire and planning. The degree of freedom required needs to be planned across the people, processes, technology and culture of organizations. The role of the strategy and architecture capability in understanding the dimensions of business and IT change needed are critical to achieving an agile environment. The relationship in Figure 1 is "The IT governance office of Strategy and Enterprise Architecture is critical for achieving Agility in Existing Information Systems".

Program Management Office

The decision rights of the office cover: a disciplined approach to project delivery; a single point of contact for project status; and ownership of project management standards.

Deliverables of the office include audited information on delivery cost and time estimates; performance to plan; delivery risks; and architectural compliance.

Oakton has observed that agility is a function of design and control. The role of the Program Management Office is establishing the control framework for implementation. This is a key element of the agility objectives being planned for delivery, or being explicitly ignored due to an agreed business driver. The relationship in Figure 1 is "The IT governance office of Program Management is a key element for Agility in Existing Information Systems".

Application Management Office

The decision rights of the Application Management Office cover: a disciplined approach to delivering IT-enabled business initiatives beyond the usual view of "project completion"; ownership for application support; and contact for operational support. Deliverables of the office include the measurements of service levels; problem management; and capacity and security.

The role of the Application Management Office and other support groups is unclear in regard to agility. On one hand having appropriate support is a key to a stable and effective IS environment that delivers business value on an ongoing basis despite change. However Oakton have not seen a direct impact on agility per se. The relationship in Figure 1 is "The IT governance office of Application Management has no direct impact for Agility in Existing Information Systems".

AN INTERVENING FACTOR ON THE IT FUNCTION TO ENABLE AGILITY

The IT Governance Model

Oakton has identified the IT governance model as a factor which may drive or confound the IT function's enablement of agility in existing information systems. IT governance involves specifying decision rights and accountabilities for important IT decisions. The aim is to encourage desirable behaviours in the use of IT. An international survey of more than 250 organizations found a wide variety of arrangements for "decision rights" (Weill 2004). These arrangements were classified into IT governance "archetypes" that include: Business Monarchy; IT Monarchy; Feudal; Federal; and IT Duopoly. An organization should conform to only one of these IT governance models.

Business Monarchy

A Business Monarchy model of IT governance has the corporate-level business executives making IT decisions that affect the entire organization. The Chief Information Officer may participate as an equal partner with other corporate-level leaders. The corporate-level business executives receive input from many sources, including the Chief Information Officer's direct reports, the business units, and organization-wide program management.

Oakton has observed that organizations with a Business Monarchy are at risk unless agility is available. This is because of the constant business drive for change (and sometimes without IT moderation) has no real understanding of the systems implementations. Agility is not just the ability to do what the business wants in an instance but being able to efficiently support a changing set of needs on an ongoing basis. The relationship in Figure 1 is "The IT governance model of Business Monarchy has organizational risk mitigated by Agility in Existing Information Systems".

IT Monarchy

In IT Monarchies, the IT professionals make the IT decisions. Organizations implement IT monarchies in many different ways, often involving IT professionals from both corporate teams and business units.

Oakton's observation is that this style of governance inwardly focuses the agility on technology in information systems rather than business initiatives. The implemented electronic processes and networks change the nature

and the focus of the IT function. As with all of the observations, it is a matter of degree rather than absolute focus. The relationship in Figure 1 is “The IT governance model of IT Monarchy drives technology-based Agility in Existing Information Systems”.

Feudal

The feudal model has business unit leaders, key process owners, or their delegates making the IT decisions for a business unit, region, or function. The feudal model does not seek synergies across business units.

Oakton’s observation of these organizations is that agility is compromised because of the number of leaders driving unique change. This tends to fragment the change program and challenge the IT function’s management of the program. The relationship in Figure 1 is “The IT governance model of Feudal compromises Agility in Existing Information Systems”.

Federal

The federal model of IT governance has corporate executives and business unit representatives coordinating decision-making across two levels of the business hierarchy. Business-unit representatives can be the business unit leaders and/or process owners. IT leaders from the corporate level or the business units may also participate, but do not take the place of a business group.

Oakton has observed that this model is effective in driving the need for agility. This is because the model requires, on a peer basis, the tradeoffs between business needs and system capabilities to be balanced. The information systems supporting this model need to be agile to fulfil the business needs. The relationship in Figure 1 is “The IT governance model of Federal is effective in driving Agility in Existing Information Systems”.

IT Duopoly

The IT duopoly governance model is where decisions represent an agreement between IT executives and one business group as a two-party arrangement. The IT executives may be any combination of IT groups. The business group is typically C-level executives, business unit leaders, or business process owners.

Oakton believes that an IT duopoly is expensive and tends to cause internal IT tension as the variety of duopolies within an enterprise clash. In this light, Oakton sees flexibility rather than agility as a key issue; that is, more the ability to handle the greater scope of bipartisan activity than to be able to change quickly. The ability to change remains important, and the appropriate control mechanisms are vital to understand the impact of the change across a broad range of capabilities. In this case of IT duopoly, agility helps moderate the “agreement” risk by being able to understand the impacts of change across a broader range of relationships and system/service provision. The relationship in Figure 1 is “The IT governance model of IT Duopoly has “agreement risk” moderated by Agility in Existing Information Systems”.

AN ELEMENT OF AGILITY IN EXISTING INFORMATION SYSTEMS

Industry Best Practice

The question can be put: “How is agility determined by industry best practice?” The most accepted best practice for a governance and control framework in the IT function is COBIT (IT Governance Institute 2007).

Oakton notes that COBIT is a control mechanism with a heritage in the Audit capability. This control mechanism, properly implemented, enables consideration and management of change from the proactive consideration of the business needs, and the management of the technological implementation. Oakton has also observed that effective agility requires a good control mechanism to ensure the desired outcomes are achieved. In this light, Oakton considers that industry ‘best practice’ is an element rather than a determinant of agility. The relationship in Figure 1 is “Agility in Existing Information Systems has an element of Industry ‘best practices’”.

DISCUSSION

For IT professionals, agility in existing information systems can open up more options for near-horizon adaptations being implemented. To enable future adaptations by leveraging existing IT investments, the paper focused on how the IT function can sense and respond rapidly to emerging opportunities, and open up options for near-horizon adaptations.

This paper provides some insight into Oakton’s experience on agility in existing information systems and, specifically, how the IT function can leverage those systems for emerging opportunities. The paper proposes the return on investment into agility in information systems is likely to be positive or negative depending on the turbulence or stability of the business environment, respectively. A return on investment is also likely to be positive where the operating model is unified or diversified, and less likely for coordinated and replicated

operating models; and positive where the organizational culture has a low power distance to decision-makers, low uncertainty avoidance or high individualism.

Given a potential return to an organization from agility, the paper proposes the IT function is more likely to leverage existing information systems with an investment into the Policy, Intelligence and Delivery capabilities; and the governance offices of Strategy & Enterprise Architecture and Program Management. The paper proposes that the agility of information systems can be indicated by maturity levels of industry best practice achieved in the IT function.

Importantly, the paper proposes how different models of the IT governance, at the whole-of-organization level, can drive or confound the enablement of agility by the IT function. In some IT governance models, the inherent risks of the model may be mitigated by the IT function enabling agility. On the other hand, Oakton suggests the IT Monarchy and Feudal governance models may compromise the IT function in the enablement of agility.

FURTHER RESEARCH

The recorded observations from Oakton represent their current thinking on agility, and how an IT function can leverage the existing information systems for emerging opportunities. Three propositions were raised. First, the IT function is more likely to leverage existing information systems with an investment into the IT function capabilities. The second proposition is the agility of information systems can be indicated by maturity levels of industry best practice achieved in the IT function. Last, Oakton proposes that different models of IT governance, at the whole-of-organization level, can moderate the enablement of agility by the IT function.

These propositions are based on the observations of the client base by two Oakton managers, made in the first four stages of the investigation. Twelve other Oakton consultants verified the observations in the final stage. To overcome the limitations of these observations, such as a bias arising from the personal client interaction with the IT consultancy, a quantitative survey of the client base is in progress.

A mailed survey of Oakton's client base is being conducted to provide a snapshot of the maturity of their IT function to enable agility. The survey will test the correlation of the constructs of the maturity of the IT function, and the likelihood of agility in existing information systems. The research instrument is a Likert-format questionnaire. The survey target population is the entire client base of Oakton, and the framing of the survey is two individuals from each client organization: an IT manager and a business stakeholder.

The analysis of the responses from the mailed survey will use structural equation modelling. The predictor constructs are the maturity of the IT function capabilities, and are linked to particular COBIT control objectives as reflective measures. The endogenous construct is the Agility of existing Information Systems, and uses reflective measures suggested by Fink and Neumann (2007). IT governance heterogeneity will segment the modelling.

The anticipated contribution for IS research is a tested theory for agility in existing information systems. Fink and Neumann (2007) suggest future research to identify the mechanisms underlying the shared IT personnel and IT infrastructure capabilities that afford agility. The contribution for IS practice is extended COBIT control processes for the creating IS agility. Shortcomings in the existing COBIT framework can be discussed, and extensions of control objectives pursuant to agility may be suggested.

REFERENCES

- Agarwal, R., and Sambamurthy, V. 2002. "Principles and Models for Organizing the IT Function," *MIS Quarterly Executive* (1:1), pp 1-16.
- Baskerville, R.L. 2006. "Artful Planning," *European Journal of Information Systems* (15:2), pp 113-115.
- Beer, S. 1970. *The Heart of Enterprise*. Chichester: Wiley.
- Crozier, M. 2000. "Reading 2.2 Culture and Organization," in: *Transnational Management*, C.A. Bartlett and S. Ghoshal (eds.). Sydney: Irwin McGraw-Hill.
- Desouza, K.C. 2006. *Agile Information Systems: Conceptualization, Construction, and Management*. Oxford: Butterworth Heinemann.
- Fink, L., and Neumann, S. 2007. "Gaining Agility through IT Personnel Capabilities: The Mediating Role of IT Infrastructure Capabilities," *Journal of the Association for Information Systems* (8:8), August, pp 440-462.
- Galliers, R.D. 2006. "Strategizing for Agility: Confronting Information Systems Inflexibility," in: *Agile Information Systems: Conceptualization, Construction, and Management*, K.C. Desouza (ed.). Oxford: Butterworth Heinemann.

- IT Governance Institute. 2007. "CoBIT 4.1: Framework, Control Objectives, Management Guidelines, Maturity Models," IT Governance Institute, Rolling Meadows IL.
- Ives, B., and Mandviwalla, M. 2004. "Key Issues for IT Management in 2004." Retrieved 16 July, 2007, from <http://www.ebi.temple.edu/programs/keyissues2004/>
- Luftman, J., and McLean, E. 2004. "Key Issues for IT Executives," *MIS Quarterly Executive* (3:2), pp 89-104.
- Lyytinen, K., and Rose, G.M. 2006. "Information System Development Agility as Organizational Learning," *European Journal of Information Systems* (15:2), April, pp 183-199.
- Newman, D. 2005. "Business Drivers and Issues in Enterprise Information Management," G00129712, Gartner Inc., Stamford.
- Okoli, C., and Pawlowski, S.D. 2004. "The Delphi Method as a Research Tool: An Example, Design Considerations and Applications," *Information & Management* (42:1), December, pp 15-29.
- Osborn, C.S. 1998. "Systems for Sustainable Organizations: Emergent Strategies, Interactive Controls and Semi-Formal Information," *Journal of Management Studies* (35:4), pp 481-509.
- Overby, E., Bharadwaj, A., and Sambamurthy, V. 2006. "Enterprise Agility and the Enabling Role of Information Technology," *European Journal of Information Systems* (15:2), pp 120-131.
- Peppard, J., and Ward, J. 2004. "Beyond Strategic Information Systems: Towards an IS Capability," *Journal of Strategic Information Systems* (13:2), pp 167-194.
- Piccoli, G., and Ives, B. 2005. "Review: IT-Dependent Strategic Initiatives and Sustained Competitive Advantage: A Review and Synthesis of the Literature," *MIS Quarterly* (29:4), December, pp 747-776.
- Sambamurthy, V., Bharadwaj, A., and Grover, V. 2003. "Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms," *MIS Quarterly* (27:2), June, pp 237-263.
- van Oosterhout, M., Waarts, E., and van Hillegersberg, J. 2006. "Change Factors Requiring Agility and Implications for IT," *European Journal of Information Systems* (15:2), April, pp 132-145.
- Weill, P. 2004. "Don't Just Lead, Govern: How Top-Performing Firms Govern IT," *MIS Quarterly Executive* (3:1), pp 1-17.
- Weill, P., Ross, J.W., and Robertson, D.C. 2006. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*. Boston: Harvard Business School Press.
- Weill, P., Subramani, M., and Broadbent, M. 2002. "Building IT Infrastructure for Strategic Agility," *MIT Sloan Management Review* (44:1), Fall, pp 57-65.

ACKNOWLEDGEMENTS

The authors are grateful for the assistance of the members of the Enterprise Strategy and Architecture consultancy of Oakton, and that of Associate Professor Rens Scheepers of the Department of Information Systems at the University of Melbourne. This research was supported under Australian Research Council's Linkage Projects funding scheme (project LP0561936).

COPYRIGHT

Brett Woolley and George Hobbs © 2008. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.