The Relationship Between IS Strategic Planning and Enterprise Architectural Practice

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Modern businesses face increased levels of competitive pressure, and the IT sector is going through a period of rapid change. Many commentators regard rate of change as a key issue in the sector. These pressures have resulted in a drive for new approaches to planning and managing IT services. This paper describes a PhD research project intended to develop an improved methodology for planning and development of IT within an enterprise. It is anticipated that it will be based on a combination of IT strategic planning and enterprise architectural practice. Other relevant methods and approaches will be evaluated and incorporated as appropriate.

1. Introduction

Modern businesses face increased levels of competitive pressure, and the following factors will influence the nature and duration of current and future strategic planning:

- Shorter planning and implementation cycles.

- Frequent and rapid environmental changes, possibly with discontinuities.

- Organization units that extend beyond a single company, such as supply chains or virtual organizations. (Wagner, 2004)

In addition, the IT sector is going through a period of rapid change, and the rate of change is expected to at least maintain, if not accelerate. Many commentators regard rate of change as a key issue in the sector (CCTA, 1999). Changes include rapid emergence of new technologies and superseding of old ones; and deregulation.

These pressures have resulted in a drive for new approaches to planning and managing IT services. Within the corporate world and, to a certain extent, government organisations, *IS strategic planning* (ISSP) became pre-eminent, especially in the early 1990s. In the latter half of the 1990s, the concept of *enterprise architectural practice* (EAP) became prominent in the US Department of Defense; a trend which has flowed on into the US government sector and the international military community.

Some distinct similarities between the two approaches are apparent. A paper by the author compares the two approaches and concludes:

> "The two approaches can be viewed as complementary, rather than mutually exclusive, and there could well be significant benefits in combining elements of both, to produce a new paradigm in IT planning and management." (Wilton, 2001)

2. Aim

The aim of this paper is to outline a proposed research task to be completed for a PhD dissertation. It will involve an investigation into the relationship between ISSP and EAP, and the development of an improved IS planning methodology, by selecting "best-of-breed" methods from both domains.

3. Description of the Research Topic

3.1 IS Strategic Planning

The Central Computer and Telecommunications Agency (CCTA[1]) of the UK Treasury denotes the following concerns of ISSP: (CCTA, 1988)

- Understanding the aims and objectives of the business,

- Establishing the information requirements of the business,

- Outlining the systems to provide the information, and determining the role of technology in supporting the information systems,

- Agreeing policies and plans to develop and implement the information systems,

- Determining the role and use of resources to achieve the information systems required, and

- Managing, reviewing and evolving the strategy.

There are numerous techniques, or *methods*[2] that have been used for ISSP, including Critical Success Factors (CSF) (Rockart, 1979), Business Systems Planning (BSP) (Wiseman, 1988), Porter's Competitive Forces Model (M.E. Porter, 1980), Porter's Value Chain (Michael E. Porter, 1985), and Scenarios (Senge, 1994). Methods can be grouped together to constitute a *methodology*. Methodologies used for ISSP include that of the CCTA (1988; 1999) and Boar (2001).

Many IT vendors and consultancy organizations use proprietary methods and methodologies, some of which are adaptations of open source approaches. Examples are Arthur Andersen's *Method/1* and Coopers and Lybrand's *Summit* (Lederer & Sethi, 1988; Min, Suh, & Kim, 1999). It is also well known that organizations often develop their own methodologies,

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[1] The CCTA is responsible for formulating general IT policy and detailed procedures and methodologies for all UK government departments. More recently known as the UK Office of Government Commerce (OGC).

[2] *Method:* in this paper, understood to mean a detailed technique used to achieve a single purpose, e.g. cost-benefit analysis, Rockart's Critical Success Factors (CSF). A method can be used on its own, or combined with other methods to constitute a *methodology* e.g. CCTA IS strategic planning

often based on open or proprietary methods or approaches (Earl, 1993; Lederer & Sethi, 1988).

3.2   Enterprise Architectural Practice (EAP)

Many approaches to ISSP include *IS/IT architecture* as a deliverable of the process (e.g. CCTA, 1999). However, the scope of "architecture" envisaged in EAP is somewhat more significant – it actually subsumes many of the steps inherent in ISSP.

EAP first became prominent in the US DoD. The key documents that describe the DoD EAP framework are (U.S. DoD, 1997, 2003). Non-military approaches to EAP also exist; e.g those developed by Zachman (1987; 1997), the US Department of the Treasury (2000) and The Open Group (2003).

The underlying vision of EAP is as follows:

> "Architectures are developed to portray the evolution of an IT environment over various points in time, beginning with the baseline, or current situation. Projects to acquire … IT-related capabilities normally are comprised of changes or additions to baseline architecture. Based on priorities and anticipated resource constraints, the projects are integrated into logical groups to form time-phased intermediate architectures. … The architecture envisioned to meet all operational and business requirements is the objective architecture. Migration documents show the progression of architectures from baseline to objective …" (U.S. DoD, 1997)

An alternative view of the purpose of EA is as follows:

> "Enterprise architecture is a far-reaching concept that comprises the vision, principles and standards that govern the acquisition and deployment of technology. As such, it provides the foundation for detailed data, application and network architectures. An enterprise IT architecture is a key component of a mature IS organisation that enables alignment of business goals, consistent processes and best practice in software reuse." (Cecere, 1998)

According to US DoD practice, the key elements of an EA are: *operational*, *systems* and *technical* views of the enterprise.

3.3   Comparison of ISSP with EAP

Even from the cursory descriptions of ISSP and EAP in the preceding sections, there are similarities apparent. A more detailed comparison was conducted by Wilton (2001) who identified the following similarities and differences:

3.3.1   Similarities:

- Basic Intent/Vision: Both are high-level approaches, intended to realize a rational, affordable IT infrastructure that is consistent with business strategy and goals.

- Both include a baseline summary of existing IT infrastructure ("where are we now?"), and an objective architecture ("where do we want to be?").

- Both establish the information requirements of the business and determine the systems required, to provide and manage the information.

- Both include a fiscal dimension (however, this is much more heavily emphasized in ISSP).

- Both produce plans/architectures that are dynamic, and need to be reviewed regularly.

- Both can be used by, or adapted to, any type or size of organisation that uses IT.

3.3.2 Differences:

Table 1: ISSP and EAP - Differences

	IS Strategic Planning	Enterprise AP
Scalability	Tends to be targeted at a single enterprise entity	Can be adapted to fit a multi-level or multi-organisation enterprise (intended to produce nested architectures, or "systems of systems")
Deliverables	Not tightly defined within any particular methodology	Tend to be tightly defined, and grouped as mandatory and optional ((U.S. DoD, 1997) defines 7 mandatory products
Process	Well defined. Methodical and analytical. Tightly coupled to business strategy and cost effectiveness.	Not particularly well defined
Time window for objective architecture/ strategy	3-5 years (limited by rapid advances in IT)	Not specified
Interoperability focus	Not specifically emphasized	Inter - and intra -organisational interoperability is a key focus
Summary of overall approach	Process-oriented	Product oriented

In summary, the high-level intent of the two approaches is virtually identical, and the general scope and factors considered during the respective processes are very similar. However, the major difference is that ISSP tends to be process-oriented, with relatively little specification of the deliverables, whereas EAP is rather the opposite. US DoD EA practice, as espoused in (U.S. DoD, 1997, 2003), does not attempt to define any business processes or models which could be used to derive cost effective objective architectures. The use of ISSP methods could remedy this shortfall.

The similarities between ISSP and EAP are reinforced by Beveridge and Perks (2003) who state:

> "In many ways there is synergy between the Enterprise IT architecture and the concepts that embodies … ISSP. Both provide a medium- to long-term vision and framework within which the IT environment is implemented, including people,

structure and technologies. Both the ISSP and enterprise architecture provide guidelines for systems to be implemented, technologies to be considered, and information to be gained. The ISSP, however, considers all of these aspects at a point in time and at a higher (business) level."

4. Research Questions

The following research questions will be addressed:

1. From both theoretical and empirical views, what is the relationship between ISSP and EAP? (e.g. unrelated, partially overlapping, synonymous).

2. To what extent are different ISSP and EAP methods used in NZ (possibly Australasia), how successful are they, and how have the methods used and success levels varied over time?

3. Are the methods used and success obtained related to organisational factors? (e,g. organisation type, size, level of IT maturity).

4. Can ISSP and EAP methods be combined to produce an improved IS planning methodology?

5. Background Literature

A bibliography of over 120 relevant references has been compiled. As it is not possible to list all these in such a brief paper, the following summary of key resources is provided.

5.1 Business and IS Planning – General

Key authors include: Mintzberg, Porter, Carr, Weill and Broadbent, Currie, Earl, Nolan.

5.2 IS Strategic Planning - Practice

Authors/documents include: CCTA, Boar, Galliers, Martin, Finkelstein, Rockart, Wiseman, Porter.

5.3 IS Strategic Planning - Research

Key sources include: *Journal of Strategic Information Systems, Information Systems Research,* and *Information and Management.* Authors include: Galliers, Chan and Huff, Doherty, Doukidis, Earl, Flynn and Goleniewska, King, Lederer, Salmela, Sethi, Levy and Powell, Newkirk, Peppard and Ward, Segars and Grover.

5.4 Enterprise Architectural Practice

Key authors/documents include: Zachman, US Departments of the Army, Defence and Treasury, The Open Group, Beveridge and Perks, Bernus et al.

5.5 Enterprise Architectural Practice - Research

There is less evidence of widespread, systematic research in the field of EAP, than in that of ISSP. This is possibly because the discipline is of the order of ten years younger than ISSP, and also possibly because most of the research effort is concentrated in US government agencies and therefore much is not reported in the open source (unclassified) literature. Some research is reported in the proceedings of the 5th International Command and Control Research and Technology Symposia, held in 2000. It is also known that Professor Alexander Levis headed a group at George Mason University, Va, carrying out research into the C4ISR AF and other aspects of enterprise architecture[3]. However, the group appears to have disbanded and there is no indication of whether the work has been transferred to another venue. Key authors include: Cook, Prekop and Kingston, Noran, Sowell, Thomas et al., Vail, Catania et al., Losavio et al.

6. Proposed Methodology

The following approach is proposed:

- Literature reviews of candidate methods, methodologies and approaches including (but not limited to) ISSP and EAP. (Addresses research question 1, from a theoretical viewpoint.)

- A survey of existing ISSP and EAP, to identify usage, success rates, "best-of-breed" methods and tools. (Addresses research question 1 from an empirical viewpoint, also research questions 2 and 3.)

- Development of an improved methodology for planning and ongoing management of IT resources in an enterprise. (Addresses research question 4.)

- Validation of the improved methodology using the IS research technique of *action research*; that is, using the methodology under controlled conditions in a real organization, to test its effectiveness (Galliers, 1994). (Addresses research question 4.)

This type of approach to develop an improved planning methodology is supported in the IS research literature; eg (Levy & Powell, 2000; Levy, Powell, & Galliers, 1999).

7. Progress-to-date

Provisional registration into a PhD program was gained in March 2004. Since then, an initial literature review has been conducted and documented (24,000 words) and an outline proposal drafted. By the time of the IIMS postgraduate conference in October, it is anticipated that full PhD registration will be granted, and planning for the survey phase will be under way.

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[3] Professor Levis also holds the appointment of Chief Scientist, US Air Force (as at March 2004)

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