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## The (Enduring) Role of IS Strategy in Value Creation

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### Abstract

*Modern businesses face increased levels of competitive pressure, a turbulent business environment, and there is ongoing debate as to whether IT can continue to create competitive advantage in the modern era. Traditional IS strategic planning, most recently based on seeking competitive advantage through IT, has been stricken by something of an identity and relevance crisis. This paper addresses the issue of whether IT can still create competitive advantage in the modern business environment, and, if so, how can IS strategic planning be conducted in such a way as to create value.*

### Keywords

Information systems, information systems strategy, information systems strategic planning, competitive advantage, business value creation

### 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: (Wagner, 2004)

- 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.

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 (e.g. CCTA, 1999 11). Changes include rapid emergence of new technologies and superseding of old ones, and deregulation. These pressures have resulted in a need 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, during the 1980s and 1990s. The Central Computer and Telecommunications Agency (CCTA<sup>1</sup>) of the UK Treasury denoted 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.

However, in the post-net era (*post-net* referring to the era since the Internet came into widespread use for commerce), a debate has arisen as to whether IT can, in fact, continue to provide competitive advantage, or has it just become merely another commodity that organisations require to do business. In the modern era, can IT

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

still be regarded as a potential source of value creation, and, if so, how can IS strategic planning best be conducted in such turbulent business and technological environments?

## AIM

This paper addresses the issue of whether IT can create competitive business advantage in the modern era, and, if so, how can IS strategic planning be conducted to create value. The paper provides a brief overview of the evolution of ISSP; in particular, how the focus has changed over time. This includes the period of the 1980s and early 1990s where the main objective of ISSP was to promote competitive business advantage. The question of whether IT can still provide a competitive advantage is then addressed. The paper also explores some of the required characteristics for effective ISSP in the post-net era, and proposes an indicative IS strategy: what is termed a *meta-strategy* - that is, a strategy for formulating strategies.

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 to government and the commercial sectors. Some distinct similarities between ISSP and EAP are apparent. Wilton (2001 21) 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.”

This paper represents an intermediate output in a research task that is intended to explore the relationship between ISSP, EAP and other approaches to IS planning and development. It is anticipated that one output will be an improved approach to IS strategic planning that meets the requirements of the post-net era. Although the paper represents only an intermediate output in a larger task, it makes use of the research approach that Galliers terms *subjective/argumentative research* and represents a significant contribution on the grounds that “...this kind of creative process makes a valuable contribution to the building of theories which can subsequently be tested by more formal means” (Galliers, 1994 157).

## THE EVOLUTION OF IS STRATEGIC PLANNING

### The Changing Focus

Galliers (1993) traces the evolution of ISSP from its origins in the late 1970s as an IT-driven activity focusing on identification of computing applications (Rockart, 1979, Wiseman, 1988), through a closer linkage with business functions and requirements, to the identification of strategic business opportunities afforded by IT (Clemons, 1986, Porter, 1985, Benjamin et al., 1984). Galliers notes, however, the limitations of these opportunities such as the difficulty in sustaining competitive advantage over time, when rivals are able to emulate or even exceed applications or services without incurring the initial risk of pioneering new IT functionality. Despite the difficulties, Galliers believed that ISSP remained a key concern of IT executives (at that time anyway), and posed the question: “*What comes after competitive advantage?* in terms of the on-going development of the topic ‘IT strategy’”.

A somewhat pessimistic view of ISSP was offered by Mintzberg (1994a, 1994b) after being something of a “champion” of strategic planning earlier in his career. He offered the view that:

“...*strategic planning* is not *strategic thinking*. Indeed, strategic planning often spoils strategic thinking, causing managers to confuse real vision with the manipulation of numbers. And this confusion lies at the heart of the issue: the most successful strategies are visions, not plans ... Strategic thinking ... is about synthesis. It involves intuition and creativity.” (Mintzberg, 1994a 107-8)

While the point regarding creativity is well made, it tends to ignore the possibility of retaining both intuition and more traditional quantitative planning approaches within a methodology; that is, a combination of methods linked together in a synergistic fashion to achieve a strategy that is innovative, but which is also practicable and affordable. As concluded by Lederer and Sethi (1992): “Cost problems had the largest direct effect on [ISSP] implementation problems.”

### The Volatile Business Environment of the Post-Net Era

A recent approach to ISSP is that advocated by Boar (2001). This approach is based on the assumption that much modern business strategy is based on *hyper-competition*. This is a theory, originally attributed to D’Aveni (1994), that modern business advantage consists of a series of short duration mini-advantages, rather than the traditional view of establishing market dominance and maintaining it for a long period of time (of the order of years). This is portrayed in Figure 1 below.

Boar's methodology consists of a combination of methods that can be thought of as traditional, and others he terms as *paradoxes*. The latter is best described as "thinking in opposites"; for example, a competitor's greatest weakness will lie in his greatest strength. In other words:

"Paradoxically, IT strategists often have to recommend, to an unbelieving and astonished audience, that they should take actions that are directly contrary to routine business sense." (Boar, 2001 23)

This style of thinking often leads to a hyper-competitive firm actually negating its own competitive advantage – before another firm does it for them. An example would be a firm that deploys an improved product or service that makes its own, original, product or service obsolete. This approach implies that the IT strategy and infrastructure must be agile and highly maneuverable.

### Strategic Competitive Advantage

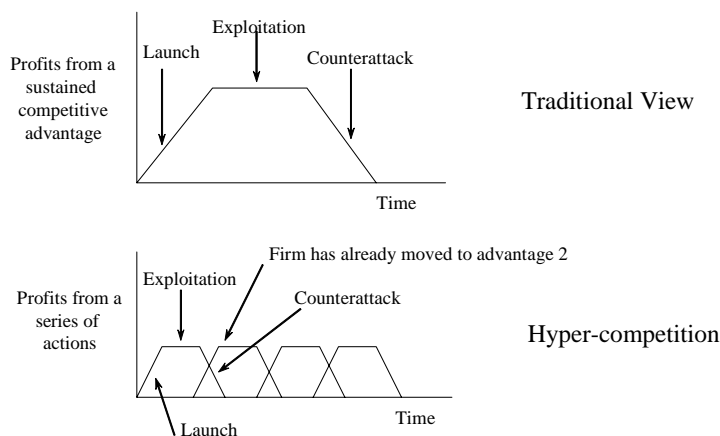


Figure 1: Strategic competitive advantage: traditional view and hyper-competition

### Post-Y2K Philosophy on ISSP

Levy and Powell (2000) contend that conventional ISSP approaches do not scale well for small and medium enterprises (SMEs). This is primarily due to the comparatively large resources (particularly staff) required for a full ISSP process at a corporate level. They have designed a new approach for SMEs that they contend is feasible in a resource- and time-constrained environment. The new approach has three dimensions. These are:

- Strategic content - opportunity evaluation and implementation planning to meet the owner's vision.
- Business context - understanding of the competitive environment.
- Business process - analysis of business activities and their support systems.

For each of these groups of activities, the authors suggest planning methods or tools that are simple enough to be carried out effectively and quickly in SMEs. The approach has been validated by Case Studies carried out in a significant number of enterprises in the UK.

The July 2004 edition of *Journal of Strategic Information Systems* presents a number of papers aligned to the theme of *Strategic IS in the Post-Net Era*. In an editorial, Gupta et al (2004) pose questions such as: how do firms develop strategies in the Internet business environment, how can they manage complexities such as business-to-consumer and business-to-business relationships. One paper from this edition, (Peppard and Ward, 2004), is discussed later in this paper.

The focus, then, of ISSP has changed over the quarter-century or so that it has been practiced. However, if, as has been claimed, IT no longer offers the opportunity for competitive advantage, does ISSP have any enduring relevance as a significant element of business strategy? This issue will be addressed in the next section.

### CAN IT CREATE VALUE?

Following on from Galliers' theme that IT may not, in future, offer a sustainable competitive advantage, Nicholas Carr's controversial *Harvard Business Review* paper of 2003 entitled *IT Doesn't Matter* caused

something of a bombshell in the IS practitioner and academic communities. Carr (2003, 2004) suggests that IT, in fact, should be regarded simply as an infrastructure to enable business, in the manner of other “commodities” such as transportation services and energy. He states: “... what makes a resource truly strategic – what gives it the capacity to be the basis for a sustained competitive advantage - is not ubiquity but scarcity. You only gain an edge over rivals by having or doing something that they can't have or do.” (Carr, 2003 42). Commodities such as rail transport and electricity offered significant commercial advantage early in their existence, but the demand for them led to a period of rapid expansion (what he terms “build-out”), which in turn led to widespread availability and significant decreases in price. That is, they became infrastructure, and standards used tended from proprietary in the early stages, to open and universal.

Carr claims: “The only meaningful advantage most companies can hope to gain from an infrastructural technology after its build-out is a cost advantage – and even that tends to be very hard to sustain. ... That's not to say that infrastructural technologies don't continue to influence competition. They do, but their influence is felt at the macroeconomic level, not at the level of an individual company.” He suggests that “IT management should, frankly, become boring” and that the new rules for IT management should be based on: spend less; follow, don't lead; and focus on [own] vulnerabilities, not opportunities (Carr, 2003 44).

Perhaps one underlying factor that fed Carr's pessimism is the fact that there hasn't been a major paradigm shift in business innovation utilising IT since the electronic commerce explosion of the early 1990s. The lack of any major new initiative for over a decade has probably contributed to a feeling that IT has run its course as a source of competitive advantage, and, therefore, its strategic value had reduced. The dot-com crash of the late 1990s probably exacerbated this notion. The situation is likely to change, however, if and when some new idea comes along.

Carr's proposition, *IT Doesn't Matter*, predictably resulted in some vigorous debate within the IT community (much of it producing heat, rather than light). There have been some interesting comments - for, against and neutral (e.g. Schrage, 2003, DeJarnett et al., 2004, Barua et al., 2004). Schrage (2003) makes the point that capital is as ubiquitous as technology, but would anyone publish a paper entitled *Capital Doesn't Matter*? A major theme in the anti-Carr comments is that it isn't IT as such that is important, but rather how it is managed and employed. Barua et al (2004 1) state:

“ ...while IT may be available for all or most firms today, not everybody is able to leverage it to the same extent. ... the focus of attention should not be on raw computer resources ... but on informational capabilities from IT that create value for customers and business partners and enable operational excellence.”

Probably one of the main refutations of Carr's premise that IT doesn't matter is offered by Kelly (1998) in commentary that pre-dates Carr's work. Kelly makes the point (in accordance with Carr's premise) that while the new (post-net) economy still relies very much on IT, IT is becoming ubiquitous, and transparent to users. However, one of the ten axioms advocated by Kelly is “Plentitude, not scarcity: value flows from abundance”:

“Plentitude, not scarcity, governs the network economy. ...this notion directly contradicts [one of] the most fundamental axioms we inherited from the industrial age ... value comes from scarcity. ... In a network economy, value is derived from plentitude, just as a fax machine's value increases as fax machines become ubiquitous.” (Kelly, 1998 39-40)

To some extent, the views of Carr and Kelly are in accordance: both believe that IT is rapidly becoming ubiquitous and very inexpensive, but the business implications and opportunities they predict that IT can create in the modern era are very different. Carr's pessimistic view reduces IT to the role of a commodity – part of the cost of doing business – whereas Kelly sees IT as an enormous source of business opportunity, due to its abundance, rather than despite its abundance.

Melville et al (2004), carried out a literature review addressing how IT contributes to organisational performance and conclude that previous studies “... are divergent in how they conceptualise key constructs and their interrelationships.” The authors propose a model of IT business value based on a resource-based view of a firm that integrates the previously-divergent research strands into a single framework. Addressing Carr's *IT Doesn't Matter* proposition, which arose during the course of their research, the authors conclude:

“We have learned that IT is valuable, offering an extensive menu of potential benefits ranging from flexibility and quality improvement to cost reduction and productivity enhancement. Our analysis also suggests that the synergies resulting from technical and human IT resources likely result in short-lived competitive advantages.” (Melville et al., 2004 311)

Swanson and Ramiller (2004) also put a different slant on Carr's view that IT doesn't matter, with their proposition that innovation with IT needs to be done *mindfully*; that is, with carefully considered purpose and

thought. Their corollary is that *mindless* adoption of IT often results in failure to achieve business goals and in wastage of resources. The authors use the term *mindful* in the following context:

“... mindfulness plays a dual role in innovation, enhancing the recognition of organisational circumstances demanding an innovative response, while also fostering effectiveness in executing the response itself. Mindfulness, however, is not simplistically promotive of innovation. It may entail *wariness* in some circumstances ...” (Swanson and Ramiller, 2004 556).

Based on the evidence and argument presented above, it is apparent that IT still has the potential to offer significant business advantage, and therefore opportunity for value creation<sup>2</sup>, provided it is developed and deployed *mindfully*. In the absence of any new IT paradigm beyond e-Commerce (and m-Commerce, which is considered to be e-Commerce just using a different form of telecommunications network), competitive advantage is likely to be incremental and of short duration. None-the-less, opportunities to create significant business advantage exist, and, therefore, the need for an effective IS strategy, and an associated planning process, remain relevant. However, the nature of the planning activity and resultant plan need to be adapted to suit the new environment. This aspect is explored in the remainder of the paper.

The quest for competitive advantage through innovative use of IT (or any other innovative business strategy) ultimately involves risk (Clemons and Gu, 2003, Markus, 2004). Usually, high levels of innovation and/or entrepreneurship equate to high levels of risk and vice versa. It is outside the scope of this paper to explore this theme – willingness to accept, mitigate or manage risk is assumed, in the adoption of any innovative business strategy.

## FACTORS IMPACTING ON IS STRATEGY AND ISSP IN THE MODERN ERA

This section of the paper explores some significant issues that have the potential to impact on IS strategy and ISSP in the post-net era and into the future.

### The Significance of Infrastructure

A view of the significance of IT infrastructure is that offered by Weill and Broadbent (Weill and Broadbent, 1998, Broadbent et al., 1999). This work characterizes IT investments into four types:

- *Strategic investments* that are intended to change the way a firm competes,
- *Informational investments* that provide and manage the information senior and middle management need to manage and control the business,
- *Transactional investments* that support operational management, and
- *Infrastructure investments* providing a base foundation of IT capability, similar to that provided in a city by roads, hospitals and schools.

Weill and Broadbent postulate that the value that a firm derives from its infrastructure depends on objectives for the infrastructure. These could be considered to be as follows:

- Economies of Scale (utility) – the business sees infrastructure as a necessary and unavoidable cost and is provided by the IS department.
- Support for Business Programs (dependant) – the business ties its infrastructure to specific, known business programs and is therefore viewed as a necessary cost of doing business.
- Flexible, to meet changes in the marketplace (enabling) – a firm that continually realigns its IT infrastructure to match and support its business strategy. The primary benefit is long-term flexibility, so the firm doesn't tie its infrastructure to its current business strategy or plans.

The *enabling* approach is similar to the view of IT *as* infrastructure advocated by Carr (2003, 2004), and is consistent with the ISSP methodology advocated by Boar (2001). Adoption of this approach facilitates the rapid development and deployment of business applications, which is consistent with the requirements of a hyper-competitive environment.

The potential ability of a flexible infrastructure to provide a source of competitive advantage is also recognised by Kumar (2004). Kumar's approach “... builds on the idea that IT flexibility is a significant source of value” (Kumar, 2004 28) and proposes a method for estimating the value resulting from the interaction between an IT

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<sup>2</sup> Gaining competitive advantage through use of IT is not the only area where IT can create value. However, space limitations have meant that it is not feasible to explore other areas in this paper

infrastructure and its organisational context. Kumar also makes the point that infrastructure decisions must be made with a view towards affordability: "... flexibility is not always cost effective. Investing in a flexible IT infrastructure in an environment with only a few jumps of small magnitude may not be justified." (Kumar, 2004 29)

### Development of an IS "Capability"

A recent view of ISSP is provided by Peppard and Ward (2004) which advocates a resource-based approach to the provision of IT. This approach portrays ISSP as a process involving the development of an IS *capability*. A capability is defined as: "...the strategic application of competencies ... i.e. their use and deployment to accomplish given organizational goals. Within this context, defining and creating the desired organizational capability would be determined by its future goals ..." (Peppard and Ward, 2004 9). This approach represents a "... perspective on the management of IT in organizations that specifically considers how organizations can continuously derive and leverage value through IT." (Peppard and Ward, 2004 1)

Peppard and Ward (2004) outline a number of IS competencies that may be required, and present a model that links resources, competencies and the desired IS capability. Another model links the IS capability with other aspects of organizational performance (see Figure 2 below).

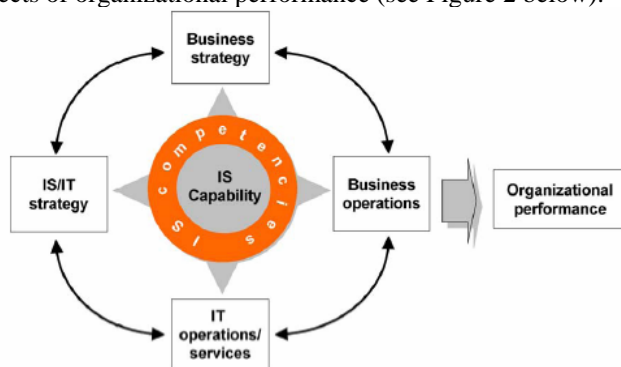


Figure 2: The new IS/IT alignment: IS capability and organisational performance (Peppard and Ward, 2004 21)

### Sense-and-Respond Strategy-making

Bradley and Nolan (1998) and McNurlin and Sprague (2004) describe a flexible approach to ISSP that is entitled *sense-and-respond*. The approach is predicated on the fact that the modern business and IT environments are too volatile for the traditional lengthy (of the order of six months or more) planning cycles and strategies that are expected to largely remain in place for a time window of three to five years. The sense-and-respond approach is about adopting a flexible posture in terms of IS/IT architecture and plans, so that rapid changes can be made to match corresponding changes in the business environment. This is portrayed at Figure 3 below.

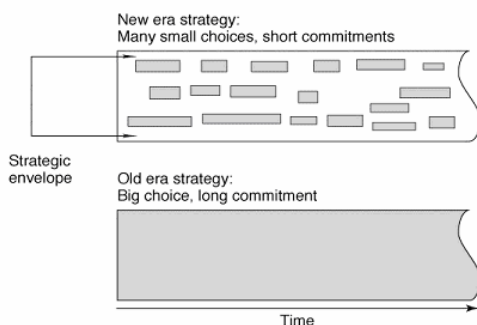


Figure 3: Sense-and-respond strategy-making (McNurlin and Sprague, 2004 121)

This is somewhat similar to the approach advocated by Boar (2001) in terms of the required flexibility. However, sense-and-respond is not specific in terms of exactly how short the response times are required to be – something of the order of weeks or even months would create significant difficulties in practice for IT staff if they were required to change direction significantly. The identification, selection and implementation of new technology often requires much longer than that.

In a way, sense and-respond could be thought of as a "do nothing" approach – allowing strategy to evolve in a serendipitous manner. While the need for flexibility is acknowledged – an old military adage is that *a battle*

*plan only survives until the first shot is fired* – a reactive, ad hoc approach to IS strategy does not seem a particularly sensible idea. Frequent, rapid, major changes to an organisation's total IS portfolio, without the opportunity for adequate change management, incur high risk from both the organisational and financial points of view (Markus and Benjamin, 1997, Markus, 2004).

A lower-risk option is the *enabling infrastructure* approach advocated by Weill and Broadbent (1998) in which a very capable, but flexible, infrastructure is adopted, which allows applications to be rapidly developed and deployed to gain the required degree of business flexibility.

Given the fact that a major change in IT standards, platforms or even user applications by an organisation can take of the order of months or years, rather than days or weeks, how can an organisation gain the IT agility to support an agile business strategy such as that required for a hyper-competitive environment? Effective IS strategic planning and the formulation of an innovative IS strategy remain relevant, as they have been in previous decades. How these can be carried out in the modern business environment is suggested in the next section.

## **AN IS META-STRATEGY FOR THE POST-NET ERA**

As IT still presents opportunities for business innovation and competitive advantage, the importance of an innovative IS strategy, and therefore, effective IS strategic planning process, remain undiminished from the requirements of previous decades (e.g. Rockart, 1979, Benjamin et al., 1984, Porter, 1985, Galliers, 1993). This section presents initial, as yet untested, hypotheses on the required characteristics of ISSP in the post-net era, and a "sample" vision for IS that could be the basis of a modern IS strategy. Together, these constitute what is termed an *IS meta-strategy* – that is, a strategy for formulating IS strategies. As stated previously, this paper represents an intermediate step of research-in-progress and the hypotheses are subject to validation in due course; probably by the development of an improved approach or methodology for IS strategy planning and validation of this using the *action research* method (Galliers, 1994 157-158).

### **Required Characteristics for a Post-Net Era IS Strategy**

The following is an indicative list of the required characteristics of a post-net era IS strategy for a hyper-competitive environment. They could be considered a set of principles to guide IS strategic planning, and have been adapted from the information management principles of Lewis (2005). Different principles might apply in different environmental circumstances. The use of selected principles to guide strategy-making is also part of The Open Group Architectural Framework (TOGAF) (The Open Group, 2003), and is outlined by (Systems and Software Consortium, 2004, Perks and Beveridge, 2003 106, 114).

- Establish a flexible and capable IT infrastructure (n-tier, standards-based). The essence of this approach is to de-couple components such as business processes, business services, applications and technologies to allow rapid changes of components without affecting other components. The service-oriented architecture (SOA) approach shows promise, in that it provides for an appropriate element of loose coupling or de-coupling and therefore enables an agile IT environment to support a volatile business environment (e.g. Baglietto et al., 2005, Crawford et al., 2005) The conceptual SOA is shown at Figure 4 below.
- Maximum adoption of Open standards and APIs.
- Adopt consistent, standards-based human-computer interfaces (HCI). This reduces training time and eases implementation.
- Develop an effective IS capability. A good example of the effective recruiting and motivation of IT staff and the positive effect this had on competitive advantage is provided by Barton and Peters (1992). Develop and use a "surge" capability when needed (e.g. outsourced development), consistent with protection of key intellectual property.
- Use a rapid, "bare bones" ISSP process utilising a simple, easy-to-use methodology. An example is the ISSP methodology developed for small and medium enterprises (SME) by Levy and Powell (2000).
- Develop a dynamic IS strategy, maintained in "soft" format; easy to "sense and respond". This topic is addressed by Wagner (2004).
- Rapidly develop and deploy applications, or application modules, to realise short-fuse business opportunities.
- Acquire hardware, middleware and other supporting infrastructure "off the shelf".



- Eliminate legacy systems as soon as possible. This allows IT staff to concentrate on core business (developing and deploying applications for competitive advantage) and reduces maintenance costs. If it is not feasible (or cost effective) to eliminate legacy systems, integrate them into the new infrastructure using approaches such as enterprise application integration (EAI) or a service-oriented architecture.

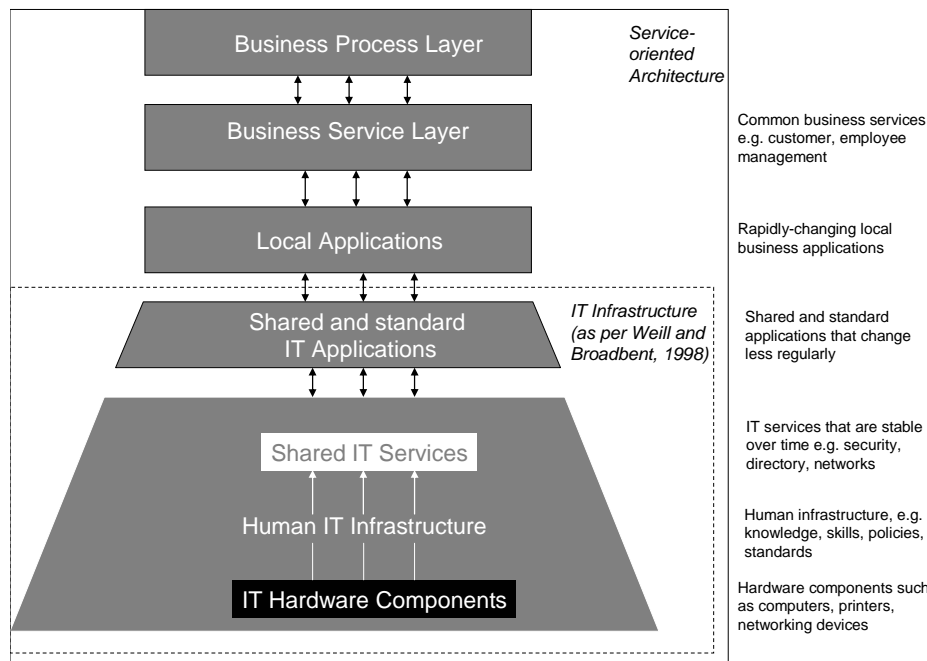


Figure 4: The service-oriented architecture (adapted from Weill and Broadbent, 1998 86)

### An Indicative IS Vision

An indicative IS vision for the post-net era, for an organization wishing to gain significant competitive advantage in a hyper-competitive environment is likely to be based on a highly-capable, flexible, n-tier infrastructure; an excellent IS capability (that is, IS staff – either in-house or external) and the rapid development and deployment of applications or application modules to realize short-fuse business opportunities. This strategy must be regarded as dynamic, and be documented and realized as flexibly as possible, to facilitate technological and business agility. The adoption of open standards and maximum use of off-the-shelf IT components are keys to flexibility and agility.

The viability of a strategic approach involving rapid deployment of applications or application modules to realize short-fuse business opportunities is illustrated by the success of the QR (Quick Response) program, albeit in a limited domain – that of specialty retailing. This is documented by Palmer and Markus (2000). QR represents an array of technology options that support the company's retail mission: "This array is often visualised as a hierarchical set of tools, with each level building on that below it" (Palmer and Markus, 2000 244). The suite allows rapid deployment of retail IT functionality, such as automated point-of-sale applications (at the lower level) and having suppliers take over inventory management functions (at the higher level). Palmer and Marks (2000 251) hypothesised (amongst other propositions) that "specialist retailers that adopt QR will out-perform those that do not adopt QR". Results demonstrated that use of QR significantly improved all but one measure of performance. Profitability, comparable store sales growth, sales per unit retail floor-space and stock turn were all improved; the only area where no improvement was noted was in sales per employee.

### SUMMARY AND CONCLUSIONS

This paper addresses the issue of whether IT can create competitive business advantage in the modern era, and, if so, how can IS strategic planning be conducted to help create value. The paper provides a brief overview of the evolution of ISSP; in particular, how the focus has changed over time. This includes the period of the 1980s and early 1990s where the main objective of ISSP was to promote competitive business advantage. The question of whether IT can still provide a competitive advantage is addressed, and it is concluded that IT still has the potential to create significant business advantage (and thus create value) provided it is developed and deployed *mindfully*. IS strategy, and IS strategic planning, continue to have a significant role in this regard.

The paper also explores some of the required characteristics for effective ISSP in the post-net era, and provides an indicative IS strategy: what is termed a *meta-strategy* - that is, a strategy for formulating strategies. The meta-strategy consists of some initial (untested) hypotheses on the required characteristics of ISSP in the post-net era, and a “sample” vision for IS that could be the basis of a contemporary IS strategy. An indicative IS vision for the post-net era, for an organization wishing to gain significant competitive advantage in a hyper-competitive environment, is likely to be based on a highly-capable, flexible, n-tier infrastructure; an excellent IS capability (that is, IS staff – either in-house or external) and the rapid development and deployment of applications or application modules to realize short-fuse business opportunities. A service-oriented architecture is an approach that may provide the required IT agility to gain competitive advantage in a volatile business environment.

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