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Re-Examining IT Investments: Measuring Long-Term Payback in the E-Commerce Era

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ABSTRACT

Traditional return on investment (ROI) metrics have been used in organisations to evaluate the feasibility of investments in information technology (IT) during the pre electronic-commerce era. However, with the advent of e-commerce, some organisations are still utilising this formal measure while others are searching for alternative methods that will prove to be better instruments. The problem with ROI methods lies in the lack of attention paid to internal and external changes in organisations and the changing role of IT. This paper compares the key underlying factors that define pre and post e-commerce IT eras, and argues that many of the IT investment metrics still in use today are derived from the pre e-commerce era of controllable procedures, products and customer bases. It proposes that only a closer study of the strategic organisational changes brought about by e-commerce and carried out from a long term perspective will lead to the development of more pertinent methods to evaluate IT. An investment banking group case study is presented to support this view and demonstrate the importance of adopting a strategic long-term outlook in evaluating e-commerce investments.

INTRODUCTION

Ten years ago, in the pre electronic commerce (e-commerce) era, Willcocks and Lester (1991) argued that there was a need for flexible and regularly reviewed approaches to the evaluation of information technology (IT) investments (p. 298). Their research had found that a number of organisations used traditional cost/benefit analysis as the basis of investment decision making, despite the fact that technology was evolving constantly. Willcocks et al. (1998) report similar findings in the post e-commerce era, suggesting that a detailed understanding of fundamental technology changes since the 1960s and the economics underlying the technology have an impact on the way IT investments are made. Organisations adopting e-commerce or in the process of considering this type of IT investment, have found that traditional Return on Investment (ROI) calculation methods are insufficient for the purpose of measuring IT payback (Moozakis & Lewis 2000, Lewis 2000a, Violino 2000b) and have attempted to implement alternative evaluation methods, ranging from quantitative metrics, such as financial gains directly attributable to IT (Violino 2000a), to measures which involve treating an IT investment as a separate business venture with separate account-keeping procedures (Cameron 2000).

While Willcocks et al. (1998) suggest valid external reasons for implementing changes in IT payback methods, shifts in technology have also had a direct impact on internal organisational procedures, products and boundaries. Equally, the organisational context itself has shaped the technology being utilised. This makes it necessary to take a step back from the obvious reasons why IT can no longer be measured using formal ROI methods, and re-examine the *strategic* impact that e-commerce has had on products and boundaries. When trying to measure the feasibility or profitability of e-commerce investments, the shift in strategic internal organisational factors caused by e-commerce needs to be taken into account before any measures of investment are undertaken.

This paper will begin by briefly examining the use of ROI metrics in organisations and some of the alternative measures being adopted today. It then proceeds to discuss the fundamental organisational differences between the pre and post electronic commerce IT eras, with a particular emphasis on the role of technology and the strategic shift in internal organisational factors. A case study about an investment banking group is presented to support this view and demonstrate the need for adopting a strategic outlook when evaluating e-commerce investments. Finally, the paper concludes by highlighting the need to re-examine the functions and role of IT and e-commerce within the organisation before undertaking any measures of investment evaluation.

RETURN ON INVESTMENT

It has been argued that traditional ROI measurements have become obsolete and invalid for various reasons in the e-commerce era (Robinson, 1999; Cartwright & Oliver, 2000). Organisations have encountered different problems in attempting to formally measure the profitability of IT investments in e-commerce. These include the inability of accounting for hidden costs and intangible strategic benefits of e-commerce and the necessity of constantly revising evaluation methods in line with the fast pace of IT developments (Violino 2000b). Conventional ROI calculations fail to alleviate these problems. Moozakis and Lewis (2000) argue that this is due to the lack of product tangibility and an increase in virtual organisational structures, developments that are in direct contrast to the formal, material nature of ROI measurements.

There have been diverse attempts to apply different forms of evaluation methods and calculations in order to gauge the payback of IT investments. Indeed, Wilder (1999) reports that many organisations are "tossing out conventional thinking about the need for a return on investment and focusing on how the initiatives advance their overall business strategy whether it's to improve customer satisfaction, increase brand awareness, or open new sales channels" (p. 48). Organisations have begun to rely on in-house, as well as off-the-shelf products for this purpose (Moozakis & Lewis 2000). Some of these methods include

identifying sources of sales revenue generated through and attributable to e-commerce (Violino 2000a), customer satisfaction surveys (Violino 2000b), measuring the IT performance of an e-commerce website as a whole, operational cost savings, observing customers' online purchasing habits, determining the revenues generated during off-business hours, counting online transactions and numbers of online visitors (Lewis 2000b), as well as benchmarking against competitors. Where these methods fail, they are replaced by the instincts and experience of managers (Violino 2000a). Not surprisingly, some organisations have begun viewing e-commerce outlays as absolutely necessary, regardless of cost, in order to remain competitive (Quinn 2000). Cameron (2000) further confirms the abandonment of formal ROI calculations by stating that IT investments can be justified for any number of reasons, without ever measuring any form of ROI, highlighting the importance of e-commerce in the modern organisation.

Due to the higher percentages of revenues being spent on IT investments (Violino 2000a) and the assortment of techniques used to justify the adoption and measure the profitability of e-commerce, it is obvious that suitable evaluation methods are required to make as accurate an assessment as possible. While many organisations have been caught-up in e-commerce without ever being given the opportunity to consider what it involves, it is appropriate to consider fundamental changes have taken place in the organisation as a result of e-commerce and how changes affect the ways in which IT payback is measured.

PRE AND POST E-COMMERCE ERAS

The introduction of technology into an organisation must be viewed contextually such that the linkages between organisational structures and actions are recognised and catered for (Orlikowski 1992). Faia-Correia et al. (1999) suggest there is a duality in technology – technology is shaped by the organisational context housing it, while the technology itself will ultimately shape that same organisation. The following section will elaborate on the state of IT adoption and evaluation practices during the pre and post e-commerce eras, in light of this duality.

Pre E-Commerce

In the past organisations primarily relied on a product base that was supported by stand-alone technology. The products themselves were tangible, requiring physical inputs and processes, which could be clearly evaluated. This meant that the introduction of technology into these processes could likewise be evaluated and directed towards aggregate financial outcomes that were related to exact revenue goals for the entire organisation. This technology was designed to embody existing organisational values and practices, power relationships and conventions, where strategies were fixed and controllable (Kuljis et al. 1998). The role of the technology was simply to increase efficiency at a procedural level (Schneider 1999), rather than a strategic one.

Prior to e-commerce, organisations were also able to utilise technology to enforce the use of specific products and boundaries. This was achievable by limiting the number and types of products and by placing boundaries within the operational levels of the organisation. Factors that might be termed informal social ties (such as suppliers and competitors) were 'shadows' to the formal organisation. The focus, instead, was on automating procedures to achieve low-level operational competence. Therefore, pre e-commerce, decisions to invest in technology were concerned with improvements to efficiency. An organisation considering the adoption of technology calculated the ROI which was 'housed' within pre-stated operational boundaries.

Organisations could also afford to play a 'wait and see game' as new technology was implemented by their competitors. Since technology only affected operational levels, the strategic offshoot to the introduction of technology was the ability to say "me too". Much of the investment effort could be carried out on a pro-rata basis. A portion of the benefits could still be available for a portion of the required outlay. Investing in technology reactively only affected day-to-day efficiency, and not market share or strategic direction. This focus on operational workflow efficiency, where customers and products were isolated from the direct influence of IT, enabled the use of traditional ROI measurements and criteria to judge the feasibility and post-implementation profitability of IT. With the advent of e-commerce, however, a shift in internal and external role of IT occurred.

Post E-Commerce

The advent of e-commerce has radically altered the day-to-day procedures of the organisation. Schwaiger and Locarek-Junge (1998) suggest that communication has shifted from a one-sided mass communication to a two-sided netted relationship, organisation to customers. In turn, this has led to a change in customer requirements and a need to re-examine products and mechanisms used to provide those products. While some organisations have begun to address products, boundaries and communication methods, many have attempted to simply 'window dress' existing strategies with websites and e-mail.

The deep-rooted conservatism of the past has meant that organisations were reluctant to face changes either in technology or the business environment, leading to an ongoing dependence upon centralised technology. The line between the operational and strategic roles of technology has become blurred with the latter becoming increasingly ubiquitous. A number of authors (Shailer et al. 2000, Schwaiger & Locarek-Junge 1998, Beidl 1999) have suggested re-examining the organisation, not just from an internal perspective, but also in terms of extra organisational impacts. There is also a need, however, to re-examine approaches to the adoption of e-commerce.

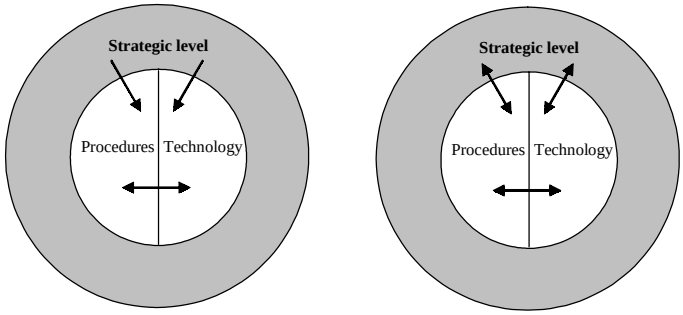
Unlike other technologies, e-commerce cannot be undertaken in a piecemeal pro-rata fashion, as previously thought. Indeed, as technology pervades the whole structure of organisations, such that web strategies become inexorably linked with overall business strategies (Lederer et al. 1997), it needs to be examined from a strategic standpoint rather than as just another technological adjunct. Norman and Zafar (1999) suggest that organisations need to clearly examine and articulate their business strategies in terms of e-commerce. If e-commerce is not considered from this standpoint, organisations will tend to remain 'dabblers' who feel they have the 'right to play' but ultimately are only wasting resources.

The investment criteria and approaches must also be taken from a strategic standpoint to be effective. In the past organisations have developed monolithic centralised information systems that managed a definable set of products through a definable set of procedures. Acquisition of technology did not alter the strategic stance of organisations, but merely supported the rigid procedures. E-commerce cannot be slotted into a strictly procedural role, but has had the effect of altering the strategic outlook of the organisation. To be meaningful, e-commerce strategies must be considered from the long-term perspective (Lewis 2000a) both on its effect internally to the organisation and on its extra-organisational impact. As such, many of the investment criteria need to be re-examined.

Apart from the criteria and the investment timing, organisations need to consider a pro-active approach, because e-commerce investments have a direct impact on market share. E-commerce has redefined the market place, giving businesses the ability to enter hitherto unattainable client bases. This change of market has, in itself, led to a myriad of strategic decisions including: which market segments are being sought, organisational structures required to operate in new markets, product/services that need to be supplied and maintained, and the pricing of products/services. With these changes the 'wait and see' strategy of the past is no longer a viable option (Jooss 1999, Norman & Zafar 1999).

The transformation from brick-and-mortar practice, through e-commerce, has meant an internal and external re-evaluation of products and procedures. Externally, where organisations once relied on stand-alone technology to support products, there has been a shift to diversified services tailored to the customer. The 'shadows' of the past have become legitimate formal structures, pushing aside old organisational hierarchies. However, internal changes have been perhaps even more disturbing for organisations. No longer are they simply automating tried and true procedures. With e-commerce many of those procedures are obsolete. E-commerce has also altered the tangibility of products. For the first time technology has a direct bearing upon the strategic level of the organisation (refer to Figure 1). Products and boundaries have

Figure 1: Impact of technology on the strategic level of organisations in the pre and post e-commerce eras



shifted significantly and become far more volatile. For example, in financial institutions the product line has shifted away from simply cash towards information and from being an agent for the product group to becoming an agent for the buyer (Achrol & Kotler 1999).

Clearly, a decision regarding the adoption of technology can no longer simply be one of examining efficiency at the operational level. It must encompass changes to products and boundaries and the strategic nature of technology. A case study about an investment banking group showing the implications of these changes will be presented next.

AN INVESTMENT BANKING GROUP: A CASE STUDY

A longitudinal case study was carried out by members of a research group from two Australian universities. The case study centred upon a multinational investment banking group. Due to privacy concerns, the organisation will be termed "Bank X" for the purposes of discussion. Bank X is a medium to large investment banking group with headquarters in the United States. It has branches worldwide, including one at the site of this case study, Sydney (Australia). The Australian site is responsible for handling a range of investments including managed funds, superannuation, allocated pensions and marginal lending. Bank X has more than 400,000 investors in Australia and manages more than $A39 billion of investor funds.

At the time Bank X first began to consider its first foray into e-commerce its Australian competitors had little or no web presence. The websites that did exist were mainly driven by promotional needs and focused on advertising services of financial institutions. E-commerce adoption was still in its infancy. Like many financial institutions, Bank X began its investigation into e-commerce investment from the standpoint of quantifiable cost and benefit measures, such as ROI. As this took place during the pre e-commerce era, e-commerce investment was simply considered from the perspective of making modifications to operational procedures, rather than re-examining strategic goals. It was clear, however, that an e-commerce presence needed to be demonstrated and that this presence needed to be more than simple static information and advertising. Bank X made a decision to provide its financial advisers with online tools that would enable them to gain 'snapshots' of their clients' positions in terms of account balances, transactions, valuations and portfolios, and enable advisers to undertake transactions in regards to equities and managed funds. Based on this decision, an initial set of requirements and goals for the website was derived:

- Provide clear value by enhancing the provision of customer services;
- Enable advisers to provide personalised customer care and follow-up;
- Not corrupt existing structures or functions within Bank X;
- Empower financial advisers.

These requirements embodied existing organisational values. They were indicative and reflective of the desire to simply increase operational efficiency without affecting existing organisational boundaries and procedures. The initial result was a website that suggested a 'me too' approach rather than a convincing strategic direction. It was clear that the decision to adopt e- commerce as well as the initial website design were strongly influenced by the over-riding philosophy of recouping investment capital based on ROI measures. Furthermore, most of the design was driven by upper management and failed to provide support for the primary business activities that Bank X was involved in. Norman & Zafar (1999) suggest that the long term goals of an organisation are usually neglected in undertaking this type of investment, and that proved to be the case with Bank X. The initial website lacked any real flexibility to incorporate the long-term business goals. New online applications which were planned were also found to be incompatible with the existing mechanisms, in both procedural and technical aspects.

It became obvious to Bank X that it would be necessary to re-examine not only the initial design but also the fundamental criteria and assumptions upon which it was based. Bank X recognised that e-commerce investment decisions could not be based on traditional measures because they did not reflect their primary business activities. It also became apparent that there was a need to re-examine strategic goals in order to align the e-commerce initiative with the strategic direction and appraise the strategic impact of e-commerce. The alignment of the strategic goals and the decision to invest in e-commerce indicated that the evaluation of any e-commerce implementation could not be simply carried out via cost/benefit number crunching and that other measures would have to be utilised. Using external consultants as well as their own financial advisers a second set of requirements for the website was derived:

- Enhancement of the company's reputation through technological leadership
- Reduction of customer response and delivery times
- Enhancement of services via value added services.
- Intensification of customer relationships and loyalty
- Facilitation of cooperation between financial advisers
- Strategic maintenance of existing banking services and ability to link these with the e-commerce.

These requirements and goals are in stark contrast to the original set which focused on low-level, operational functionality rather than strategic advantage. The second set of requirements and goals was a direct result of re-examining the investment from a strategic point of view and abandoning traditional measures in favour of long-term benefits. Based on these objectives a new website was developed to include the following functions:

- Ability to distribute individual information to customers;
- Ability to rapidly retrieve customer account details;
- Ability to exchange information between customers, financial advisers and the head office;
- Ability to rapidly respond to client requests.

The case study of Bank X provides a number of insights into the adoption of e-commerce by financial institutions. Firstly, it shows that e-commerce is not simply another technological adjunct to the organisation because it does not solely affect the operational levels of the organisation. The Bank X case study demonstrated that the initial website design was based on existing procedures with no consideration of strategic goals, leading to the development of a system falling well short of expectations and any competitive advantage. The initial design was inflexible, countering the two-way capabilities of the web in order to maintain traditional controls over data and procedures, rather than adopting a more strategic customer oriented view. Secondly, due to the strategic impact of e-commerce, making IT investment decisions in the post e-commerce era cannot be based entirely on ROI measures. It is more important to assess the long-term strategic benefits of e-commerce, a measure which does not lend itself to quantitative estimation.

CONCLUSION

The advent of e-commerce has not only provided a rapidly changing business environment between the organisation and the customer, but has irrevocably changed the very nature of the organisation itself. The sudden ability to tap into global markets (Meder 2000) and

deal with a distributed client database has not only changed the day-to-day procedures within the organisation, but has also the strategic outlook of the organisation. Where in the past products and clients were controlled by strict internal procedures, today clients are diverse and the nature of organisations' products has shifted to suit this new customer base. Establishing strategies that are broad enough to handle these changes has been difficult. No less difficult has been the use of metrics to evaluate IT investments and payback.

This paper has attempted to examine ROI metrics, both pre and post e-commerce. It has suggested that many of the metrics still used are derived from strictly controllable procedures, products and client bases. It proposes that more applicable and appropriate measures can be developed only when an examination of the strategic nature of IT, and e-commerce specifically, is carried. This examination must involve a dual evaluation of the strategic role of e-commerce and the implementation of e-commerce to achieve strategic goals. Only when these long-term implications of e-commerce investments are taken into account will it be possible to achieve a more realistic measure of the e-commerce payback.

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