Electronic Commerce Strategic Investment Justification Frameworks: An Australian Perspective

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Abstract
Strategic use of information technology, especially electronic commerce, has been used by organisations throughout the world in a vast array of industries to gain a competitive industry. With growing interest in electronic commerce organisations are now developing a new range of electronic commerce applications. However, justification in allocating organisation resources does not always follow the more commonly accepted methods. This paper explores why organizations invest in electronic commerce applications and highlights several approaches to justification. Central to the work was to determine the underlying benefits of investing in Web applications. This paper examines various models and frameworks that can be used as a form of justification. A conclusion of this paper is a framework for the justification of web-based applications by utilizing the Delphi methodology.

Keywords: Delphi Methodology, Web Based Applications, Strategic usage of IS.

1. Introduction
Strategy development and implementation of an organisation is a difficult task at best. Indeed, strategy by its very nature is constantly changing and in essence extremely difficult to define. This ensures this problem remains difficult for the manager. Indeed, a commonly held view in literature on strategy tends to adopt “a formal rational view of organisations as systems with coherent purposes and shared goals” (Walsham 1990). This homogeneous view of an organisation with its coherent purpose should allow for the formal modelling of processes to clearly define the required inputs, processing, expected success, outputs and shared goals. However, these formal rational frameworks are often highly structured proving a single view of the organisation and do not allow for the flexibility required to perform in the changing world. In
reality there is a wide disparity between theory and practice. Mitzberg (1994) highlights that formal rational frameworks too often fail to explain organisational success or failure.

Clearly, the organisation and the environment they operate in are heterogeneous. Indeed, stakeholders both in and outside the organisation may all have different purposes and may actively pursue different goals that will ultimately change the strategic thrust of the organisation. A classical case was the development of the PC Junior by IBM. IBM provided strategic solution to organisations with Information Technology as a method to automate many of the manual processes within an organisation. John R Opel, managing director of IBM decided that the current IBM strategy and management would not be capable of developing a new product such as the PC Junior in the required timeframe. His main view the current “IBM strategic and management processes would not be capable of this level of flexibility as it was not in its culture.” Instead, a development team operating outside the domain of IBM was put together with the brief of developing the new PC Junior from any components inside or outside IBM within a specific timeline. Indeed, in designing the PC, IBM for the first time contracted the production of its components to outside companies. The processor chip came from Intel, and the operating system, called DOS (Disk Operating System), came from a 32-person company called Microsoft. This is important from two perspectives. First, IBM conceded that they would be unable to take hold of the strategic opportunity utilising the resources of the organisation and need to move outside the formal rational framework of the organisation. Secondly, the managing director envisioned a new product that would meet a new market that did not exist and was not within the strategic direction of the organisation. Justification of the project was guided by the managing director, and in doing so; he provided flexibility and innovation to the organisation. This type of management trait is often a trait of an entrepreneurial manager and rarely associated with IBM.

Justification forms the basis to which decisions are made, illustrating adequate reasons for accepting an investment. It refers to any financial and non-financial approach, and should be interpreted in the broadest possible context, i.e. any method, process, procedure, technique etc. Remenyi et al (1997) illustrates this by suggesting that justification assists in understanding the impact of the change that an investment has on an organisation. Managers direct resources to achieve results. The fundamental question is which investment will achieve these goals and how can the outlay be supported by a justification methodology. Organisations need to be able to set aside the hyperbole and consider how an investment will benefit their business processes, and thus determine whether the money spent is actually being wisely spent. The well known cliché suggesting that one can not manage what cannot be measured, demonstrates the importance of understanding where and how money is being used, and what it is expected to generate.

In this paper we present the approaches and frameworks used to justifying electronic commerce strategic applications. In section 2 we examine the growing usage of the WWW for business and how the benefits of WBA’s are calculated. This section also includes a look at the currently used economic and accounting methods used to establish the benefits of WBAs. In section 3 we examine the approaches to justifying WBAs. This focuses on the current appraisal techniques and current models and frameworks for justifying WBAs. Section 4 provides an overview of the research objectives, while section 5 examines the methodology employed in examining the justification approaches used by our cohort of participants. Section 6 provides the findings of the
research. This section provides a framework for the justification of WBAs based on the research findings. In section 7 we conclude the paper.

2. Web Based Applications Justification

The World Wide Web, WWW, offers great opportunities to all sectors of the economy on an international scale, as numerous additional users are attracted every day. Amor (1999) claims that there is no exact indication as to how many people utilise the WWW, nor is there a defined number of businesses on it. Nonetheless, the Australian Bureau Statistics, ABS (1999) estimates that in Australia alone there are 5.5 million adult Web users that have increased Web shopping by 60% in the 12 months to May 1999.

Despite what is suggested by the media, organisations need to be able to determine whether a Web Based Application, WBA, is worthwhile to them as an organisation, which is why justification is important. However, the problem is traditional justification approaches that once provided beneficial information are no longer adequate. For example, in a 1997 survey (published in 1998) by the Information Industries and Online Taskforce (Online 1998) it was revealed that less than 20% of organisations with Web presence achieved a Return On Investment, ROI figure above 10% on their investment. In addition, over 45% disclosed that no return was made at all, whilst over 6% suffer from ROI losses greater than 50%. The research further stated that of the 11% of Australian organisations with Web presence in 1997, 20% claim that their WBAs play a significant role in their line of business, suggesting that ROI is not completely relied upon when justifying the investment. This reinforces the problem of justification whereby organisations continue to pour funds in WBAs, yet are unable to illustrate that money is being made and that the investment has been worthwhile. Traditional approaches evidently fail to incorporate the underlying issues relating to WBA justification. Yet before these problems are further discussed, the concept of strategic thinking must be taken into consideration as it contributes to our understanding of why organisations invest in WBAs.

Organisations have goals as to where they want to go, whilst strategic thinking identifies how such goals will be reached. Investments are deployed to support such strategies in pursuit of achieving the set goals. As stated by Silk (1991, p25) ‘Managers direct resources to achieve results.’ The fundamental question however, is which investment will achieve these results, and how the outlay can be justified. The cost of developing a WBA comprises of production servers, training staff, front-office integration, legacy systems integration, e-mail servers etc., all of which have quantifiable costs (Gartner Group, 1999). The cost to organisations investing in WBA is determined by the monetary outlay required to support the investment and the intangible effect of drawing time and resources from other departments and projects. Additionally, the benefits identified become potential losses (i.e. opportunity cost) if the organisation does not invest in a WBA.

2.1 Importance of Justification

The well-known cliché suggests that one cannot manage what cannot be measured demonstrates the importance of understanding where and how money is being used and what it is expected to generate. Unless an investment can show that the benefits outweigh the costs the money will be best used elsewhere. A study conducted by the Gartner Group (1999) revealed that the cost of developing a WBA in larger organisations ranges from $500,000 to $35 million, with the
majority of costs attributable to labour costs. Development, integration and customisation account for 60 to 70 percent of the initial outlay yet there is no guarantee that a profit will be made. Unless the organisation can differentiate itself from its competitors simply taking orders electronically and advertising product information on line will not fulfil the promises made by web developers. This highlights the importance of justification, whereby unless the organisation can identify that the investment will have a positive impact on the organisation, it should not proceed.

Angell and Smithson (1991) and Burke (1993), respectively discuss the relevance of evaluation in terms of judging the value of a system and assessing projects in terms of how well they meet the company goals and objectives. Evaluation depicts the assessment and appraisal of an investment whilst justification demonstrates the reasoning. Angell and Smithson (1991) also propose that the analysis should take into account accuracy, flexibility, functionality, productivity, profitability, quality, relevance, reliability, security, speed, usability, user satisfaction, utilisation and volume of the proposed investment to justify its adequacy to the organisation. Burke (1993) recommends a framework for quantifying company goals and objectives by answering a series of questions. Although Burke (1993) favours the use of financial techniques for their ability to demonstrate the effect on profitability, the framework assists in determining the benefits to be derived and whether they can justify the investment. The series of questions consists of whether the investment will, maximise profits, help maintain market share, increase market share or consolidate market position, enable the company to enter new markets, maximise utilisation of the workforce, maximise utilisation of plant and equipment, improve company image, create unacceptable risk and uncertainty, and be consistent in scope with company expertise (Burke, 1993).

Irrespective of the opinions raised justification must be reliable and relevant to the investment otherwise it is not worth pursuing. This relates to the concept of strategic thinking the driving force of the investment whereby overall strategic goals need to be met. Justification helps illustrate whether such goals are achievable. The fundamental question is how does one determine how to justify a certain investment? In the case of WBAs, the benefits have been identified yet the justification approach remains somewhat obscure.

2.2 Calculation of Benefits Derived from Web Based Applications

Benefits are ultimately the driving force influencing investments in WBAs, (Hares and Royle 1994). Business benefit will always produce financial return, however, financial return may not always produce business benefit. To illustrate, WBAs are perceived to produce benefits that lead to maintaining competitive advantage which in the long run help the organisation stay in business and produce financial returns. On the other hand, a WBA may reduce administration costs hence increase financial return, which may not necessarily increase business benefit. Parker et al. (1988) prefers to extend the concept of benefits arguing that cost reduction and revenue production are encompassed by value, which is based on improving business performance. Robson (1997) concurs and suggests that value is derived from increasing competitiveness by improving management processes, not the technology. Technology is simply the tool that helps attain competitiveness, which can be supported by strategic thinking.

Hochstrasser and Griffiths (1991) acknowledge the lack of value attributed to IT. Their survey determined the reasons as to why organisations continue to invest in IT. The results illustrated
that 30% of the participants considered the value of IT was attributable to non-measurable factors, such as gaining competitive advantage. Furthermore, 21% claimed that business would not be possible without the use of IT and 15% simply aimed to match the investment levels of the market. Rigorous methods to calculate benefits were utilised by only 16% of participants, whilst 18% passed the responsibility onto other departments to do the hard work. The analysis illustrates that the nature of justification has changed, as tangibles are no longer high on the list, yet there is a lack of adequate tools to support the change in value. In addition, Hochstrasser and Griffiths (1991) sought to determine where emphasis was placed when making further investments and found that 20% of participants aimed at generating new customer services, whilst 33% aimed at gaining a competitive edge. Centralising information and gaining more business flexibility was selected by 45% and 54% respectively. The strength however, was in establishing better communication (66%) and optimising internal efficiency (62%). The analysis did not reveal tangible values such as reducing costs, which conventional justification approaches are so dependent on.

2.3 A World of Intangibles

Intangible benefits according to Kaplan (1986 p188) are ‘benefits that can be attributed to a particular application but show no direct effect on cost reduction or revenue generation.’ Therefore they cannot be directly associated to profits or costs. A concise definition provided by Ross (1994) indicates that intangibles are simply expected benefits of a system that cannot be measured in economic terms. Our contention is that although the majority of probable future economic benefits derived from WBAs are intangible: their ‘un-measurable value’ should not be forfeited in decision-making.

The situation is best illustrated with an example such as the one presented by Currid (1997). An organisation’s financial statements recorded a leather topped mahogany desk as an asset worth $3000, while the employee sitting behind it, which had developed the business was recorded as a $50,000 per annum expense. Ironically the value of the desk depreciated over time while the employee became dearer as he/she further enhanced his/her skills and knowledge.

Applying the above example to the development and maintenance of WBAs, the majority of organisations that do attempt to justify their investments tend to use traditional accounting models, which overlook the necessity of intangible costs and benefits. Service industries, in particular, rely heavily on employee knowledge, which is worth more to their line of business than the building they operate in. The development of a WBA may cost a company $100,000 to establish. Maintenance fees are periodically deducted and added to the expense component of the cash flow statement. However, the benefits derived from a WBA are aggregately ignored just like the increasing value of the employee sitting behind the desk. The value of intangibles is commonly overlooked and often misinterpreted as an expense.

The concept of traditional economic and accounting measures inadequately incorporating the intangible value of benefits is supported by Brown (1994); Earl (1989); Farbey et al. (1993); Kaplan (1986); Lay (1985); Parker et al. (1988); Parker et al. (1989); Remenyi et al. (1991); Rivard and Kaiser (1989); Vaid-Raizada (1983) and Willcocks (1994). Kaplan (1986, p92-3) argued that ‘although intangible benefits may be difficult to quantify, there is no reason to value them at zero in a capital expenditure analysis … rather than attempt to put a dollar tag on benefits that are by their nature difficult to quantify, managers should reverse the process and
estimate first how large these benefits must be in order to justify the proposed investment’. In other words, rather than ignoring the value of intangibles totally, managers should estimate an approximate value and take it into consideration together with tangible value when justifying investments such as WBAs. Brown (1994 p189) then argues that Kaplan’s ‘approach risks the exclusion of intangible benefits that cannot be attracted to any measurable value’. The majority of intangible benefits rarely take place in IT departments and are rarely related directly to the investment instead they take place as a result of an improvement achieved using technology. In turn, the time and effort required to gather and analyse all the information is not justifiable.

3. Approaches to Justification

Conventional cost accounting methods have been actively taught at university level and have been used as a measure of justification since the Industrial Revolution. They have since then been altered, extended and combined to create new approaches to justification. Consequently, decision-makers have numerous alternatives to justifying their investments, many of which fail to capture the important issues surrounding the benefits of the investment.

3.1 Appraisal of Techniques

In Irani et al. (1997) a comprehensive analysis of appraisal techniques was undertaken and 65 approaches where identified and is shown in Table 1. Irani (1999) argues that organisations are faced with a changing portfolio of benefits and costs, which differ between each organisational department. This then introduces the difficulty in determining the middle ground and often leads to a simple case of producing information that convinces the person who signs the cheques (Irani 1999). Justification then becomes a matter of manipulating the above approaches, hence defeating its purpose. The sheer number of approaches available further complicates the justification process to a point where one must actively study the various techniques and identify which is most appropriate to that particular investment. This poses yet another dilemma whereby comparisons can no longer be made between investments due to the different justification tool utilised. It is no surprise that organisations prefer to use traditional approaches, or rely on an act of faith to avoid the complexity in determining an appropriate justification approach (as suggested by Silk 1991).

<table>
<thead>
<tr>
<th>Description</th>
<th>Appraisal technique</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECONOMIC</td>
<td>Payback</td>
<td>Quantifies benefits and costs.</td>
</tr>
<tr>
<td></td>
<td>Return on Investment</td>
<td>Quantifies benefits and costs.</td>
</tr>
<tr>
<td></td>
<td>Cost-benefit analysis</td>
<td>Judgmental.</td>
</tr>
<tr>
<td></td>
<td>Net present value</td>
<td>Quantitative with possible modified hurdle rates to account for qualitative or strategic aspects.</td>
</tr>
<tr>
<td></td>
<td>Internal rate of return</td>
<td></td>
</tr>
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<thead>
<tr>
<th>STRATEGIC</th>
<th>Analytical hierarchy process</th>
<th>Integrated whereby strategic, operational and financial decisions are integrated into measures of success.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYTICAL</td>
<td>Computer based techniques</td>
<td>Optimised analytical formulations with numerical solutions and various programming techniques.</td>
</tr>
<tr>
<td></td>
<td>Risk analysis</td>
<td>Judgmental scoring with formal structure to a judgmental approach.</td>
</tr>
<tr>
<td></td>
<td>Value analysis</td>
<td></td>
</tr>
<tr>
<td>INTEGRATED</td>
<td>Multi-attribute theory</td>
<td>Judgmental, whereby strategic, operational and financial decisions are integrated into measures of success.</td>
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<tr>
<td></td>
<td>Scenario planning and screening</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information economics</td>
<td>Considers financial aspects before applying strategic criteria.</td>
</tr>
<tr>
<td></td>
<td>Balanced scorecard</td>
<td>Integrated whereby strategic, operational and financial decisions are integrated into measures of success.</td>
</tr>
</tbody>
</table>

Table 1: Classified summary of appraisal techniques (Source: Irani et al. 1997; Patel and Irani 1999)

In an attempt to determine which techniques produced valuable information to justifying investments Bacon (1994) surveyed 80 Australian, American, New Zealand and British companies. The study revealed that, on average, supporting explicit business objectives and supporting management decision making were criteria’s considered more important than financial approaches such as net present value, internal rate of return, payback period etc. Although not obvious in the findings, there was a brief mention on the increasing impact
competitive advantage has on decision-making. The survey was relatively fixed in nature, whereby respondents indicated which of the criteria presented in the survey were used in decision making, restricting the analysis to the author’s predetermined thoughts. Nonetheless, it was clear that a number of techniques were used in IT justification. The following section introduces the various attempts at determining the appropriateness of approaches depending on the characteristics of the investment, which will be used in attempt to determine an appropriate approach to WBA justification.

3.2 Earls four-way framework

Earl (1989) proposed the use of a four-way framework to formulate appraisal techniques for different purposes, as shown in Table 2. It addresses organisational intentioned gains and goals to be derived from using IT. The nature and characteristics of these goals are then determined in terms of tangibility, risk, judgement etc, and then referred to suggested approaches/techniques to appraise the investment. The framework can be adapted to any investment decision, which contradicts the Hochstrasser and Griffiths (1991, p9) view that ‘no single generic procedure exists for measuring the variety of functions and benefits that have been made possible or are supported by the application of IT’. Irani (1999) in a sense agrees that no unique approach to justification can be deemed appropriate for an IT investment, for the scale is far too broad to encompass all the underlying issues. Instead, Irani (1999) suggests that appraisal should be broken down to specific applications. Earl’s framework is indeed broad, yet can be adjusted to suit investments such as WBA. The framework breaks down ‘specific applications’ by separately addressing a series of broad aims the investment anticipates to gain, which can be attributed to a classification of benefits.

<table>
<thead>
<tr>
<th>Aim</th>
<th>Goals</th>
<th>Nature</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity and performance</td>
<td>Efficiency</td>
<td>Tangible benefits</td>
<td>Financial Net present value</td>
</tr>
<tr>
<td></td>
<td>Effectiveness</td>
<td>Clear argument</td>
<td></td>
</tr>
<tr>
<td>New ways of managing</td>
<td>Change</td>
<td>Radical concept</td>
<td>Multi factor Metrics</td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td>Multi-dimensional</td>
<td></td>
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<tr>
<td>Competitive advantage</td>
<td>Product-market positioning</td>
<td>Concrete vision Strategic analysis Tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competitive disequilibrium</td>
<td>Commercial judgement</td>
<td></td>
</tr>
<tr>
<td>Developing new business</td>
<td>Diversification</td>
<td>Business venture</td>
<td>Business case</td>
</tr>
<tr>
<td></td>
<td>Growth</td>
<td>Risk and uncertainty</td>
<td>Business plan</td>
</tr>
</tbody>
</table>

Table 2: The four-way framework (Source: Earl, 1989)

Productivity and performance focuses on improving efficiency and effectiveness whereby benefits are easily identified and measured. New ways of managing seeks to improve current
management and business processes, while developing new business aims to generate new business and diversification. Finally, competitive advantage pursues product market positioning to ultimately create a competitive disequilibrium. Referring back to the factors identified above by Angell and Smithson (1991) such as accuracy, reliability and accessibility, Earl (1989) inadvertently termed these factors as goals relating to the organisational aims. The approach/technique allocated to each of these aims are somewhat limited in choice, yet do give an indication as to the type of approach that is suitable in each case. Earl provided the essential link between benefits and justification approaches.

Irani et al. (1997) does however produce a more concise analysis of the various approaches available, which can be easily related to Earl’s four-way framework. The approaches selected by Earl can be classified under Irani et al.’s broader classifications and linked back to the aims i.e.:

1. Financial techniques such as net present value can be classified as economic approaches used to justify productivity and performance aims.
2. Multi factor and metrics can be classified as analytical approaches to justify new ways of managing.
3. Strategic analysis and tests can be classified as strategic approaches and used to classify competitive advantage.
4. Business case and business plan can be classified as integrated approaches used to classify developing new business.

In an attempt to determine which approaches may be applied, two frameworks have been examined, of which Earl’s appears most comprehensive as it attempts to translate the value of business aims. Earl’s four-way framework, in conjunction with Irani et al.’s classification of approaches, have been identified as being the most useful in determining the links between benefits and approaches. Nonetheless, there is still no indication as to which approaches are most appropriate to WBAs. This introduces the next section whereby organisations are questioned on their experiences in determining the most appropriate approach to justifying WBAs, keeping in mind the classifications of Earl (1989) and Irani et al. (1997).

4. Research Objectives

The main objectives of this research were:

1. To investigate the benefits of investing in web based electronic commerce applications. The first objective examines the various reasons as to why organisations invest in web based electronic commerce applications, to determine the benefits that they anticipate to attain and impediments they expect to avoid. These elements will then lay the foundation as to what a justification approach must highlight, and it is anticipated that the majority of reasons will be intangible in nature.

2. To highlight the justification approaches that best capture the issues regarding web based electronic commerce application investments. The second objective intends to determine a framework that captures the issues raised in the first part of the study. There are numerous justification techniques that tend to be variations of other techniques, which have been altered to suit varying purposes, yet there is no suggestion of reliability and
suitability to electronic commerce applications. The second objective concentrates on analysing the various approaches and identifying where and how they can be used to justify electronic commerce investments.

5 Methodology

The Delphi technique was selected due to its ability to aggregate individual ideas independently. Participants are invited to put forward their experience and knowledge anonymously in their own time and benefit from the results. Willingness and motivation to participate is probable in that organizations have experienced difficulty in justifying their Web Based Applications, WBA, and would be eager to reach consensus. The problem and benefits from subjective judgements as identified by Linstone and Turoff (1975). Delphi sets aside any predetermined thoughts influenced by the literature and seeks to identify results based on what is experienced in the real world. The underlying benefit to the Delphi techniques is that both respondents and researcher can gain a valuable insight into issues as it draws to a conclusion. A diverse body of knowledge and ideas are independently brought together and analysed by experts whom in turn learn off each other whilst the researcher collaborates the information to derive a conclusion (Kress and Snyder, 1994).

The study took place over four months, and consisted of three rounds of questionnaires of which can be summarised as follows:

Round 1: Identifying the justification approach(es) used to highlight the issues regarding investments in WWW applications.

Round 2: Ranking the justification approach(es) used to highlight the issues regarding investments in WWW applications.

Round 3: Seeking consensus on justification approach(es) used to highlight the issues regarding investments in WWW applications.

The series of questionnaires begins with a fairly broad question concerning problems, objectives, solutions or forecasts. Succeeding questionnaires are then based on the responses of previous questionnaires, and the process continues until a consensus is reached or sufficient information is gathered (Delbecq et al. 1975; Linstone and Turoff 1975). The first questionnaire requested a brief description of the reasons as to why the organisation decided to invest an application on the Web. These factors may be internal and/or external to the organisation, such as to attract customers, improve competitive advantage, improve performance and productivity, expansion and growth or to improve management. It also requested a brief description of what financial and non-financial techniques were used to show adequate grounds for proceeding with the investment. The intent of the broad scope of the initial questions was to allow participants to respond open-mindedly and respond without prejudice. The second questionnaire was short enough for the respondents to review, criticize, support, or oppose the findings from the first round (Delbecq, et al 1975). It was more restricted and asked the participants to review the benefits and techniques identified in the first questionnaire and argue in favour of or against the benefits and approaches identified. The aim was to help participants understand each other's position, introduce different ideas and to move toward accurate judgements concerning the relative importance of the benefits and techniques.
The selection of participants was based on organizations that were involved in investing in electronic commerce applications, from well-developed and fully functional sites to yet to be developed sites.

6. Findings

All participants were able to adequately answer the section regarding the benefits, identifying a total of 31 different benefits. Each participant actively took part in identifying and commenting on the benefits of investing in electronic commerce applications. Justification on the other hand was somewhat more complex, emphasizing the difficulty of justification. A total of eight different justification approaches were identified. Each approach had a varying number of corresponding issues supporting their appropriateness to electronic commerce applications. Drinjak (2000) examines the reasons why firms invest in electronic commerce applications and the methods used to financially justify those projects. It was found that the justification methods typically used fall into four groups. These are:

- Strategic techniques which view the long-term impact of the organisation taking into consideration both tangible and intangible factors, which ultimately lead to competitive advantage.
- Analytical approaches which are highly structured incorporating risk into the analysis, and relate to developing new businesses with growth and diversification.
- Integrated approaches which combine subjectivity with formal structures to integrate financial and non-financial techniques, focusing on the organisation itself in terms of the way it operates.
- Financial techniques which relate to structured valuations of tangibles, that in essence have been deemed appropriate to productivity and performance.

This classification of justification methods was adopted from Patel and Irani (1999) and used in conjunction with Earl’s (1989) reasoning of appraising business aims. By examining Table 3 the types of benefits that organizations have used to justify electronic commerce applications and some of the methods that can be used to support a business case of justification are outlined. The benefits in the framework may not all be applicable to each individual organisation, yet it does give an indication as to what is probable assuming the EC application is well developed and maintained.

Surprisingly, the majority of reasons for investing in electronic commerce applications produced non-quantifiable returns (which was supported by the literature) and yet the majority of most appropriate approaches to justification were financial, requiring quantifiable data. It appears that there was a degree of confusion as to whether the financial approaches can appropriately justify electronic commerce applications, and it is possible that they may have been selected based on the participant’s ability and awareness to use them. It was evident in both the literature and the findings that there are many benefits to be derived from investing in EC applications. The benefits that were identified in the findings emphasised what was found in the literature suggesting which ones were considered more important than others. Such benefits were then attributed to Earl’s four-way framework that broadly attempts to link organisational aims to justification approaches. The benefits that were considered to be of most importance were those
### Benefits Derived

**Aim: Competitive Advantage**
- Provide 24 hours/day 7 days/week access
- Effective promotion of organisation, products and services
- Enhance quality and speed of customer service
- Create sustainable competitive advantage
- Entice shoppers and encourage customer interaction
- Bandwagon effect
- To keep up with trends in technology

**Issues Highlighted**

**Approach: Critical Success factors**
- Competitiveness
- Timely service
- Greater exposure
- Access to new markets
- Need to have a Web presence
- Creating widest possible user base
- Promotion

### Aim: Expansion & Growth

- Support core business functions / Integral to business strategy, long term vision and goals
- Provide new business opportunities and exposure to new untapped market niches
- Increase market presence
- Creating corporate / internet presence
- On-line purchasing / generate revenue from eCommerce sales
- Accessible research tool
- Levelling the playing field – globalisation, expand market place
- The Web is seen as the way of the future
- Interlinking – providing relevant links to other sites

**Approach: Value Analysis**
- Assists in judging which intangibles are of greater value to the organisation
- Emphasises value rather than cost

### Aim: Improve management & Business Processors

- Improve internal and external communication with key stakeholders
- Improve internal business processes
- Improve internal communication by providing organizational information to all staff
- Timely marketing information and sales
- Timely information retrieval and utilization (accuracy & reliability)
- Facilitate remote interaction with video capture interface

**Approach: Balanced Scorecard**
- Communicates organisational vision and strategy
Aim: Productivity & Performance

• Reduce operating costs

Approach: Cost Benefit Analysis

• Illustrates how information and service can reduce delivery time and cost

Approach: Return on Investment

• Identifies how the use of technology achieves significant cost savings

Approach: Payback Period

• Illustrates how savings in support costs cover set up costs

Table 3: Framework for justifying EC applications (Adapted from Earl (1989) and Irani (1999)) concerned with competitive advantage and expansion and growth of the organisation, in particular, providing information access 24 hours a day 7 days a week and supporting core business functions. Productivity and performance benefits on the other hand appeared to be of least importance.

In terms of the justification approaches, very few were identified in comparison to the extensive range identified in the literature. Furthermore, the literature emphasised the difficulty in justifying EC applications with financial approaches and yet the findings suggested that they were in fact the most popular. In particular the traditional cost benefit analysis was by far the most appropriate as it highlighted how information and service can reduce delivery time and cost. Nonetheless, Irani (1999) classified the approaches that were identified in the findings, which correspond to Earl’s four-way framework. It appears that the most appropriate form of justification is to determine factors deemed essential to the survival of the organisation, which reiterates the literature concerning strategic thinking. The findings in regards to the benefits were consistent with the literature, yet the justification approaches suggested were somewhat contradictory.

7. Conclusion

The major reasons for investing in electronic commerce applications were attributed to gaining intangible benefits. Our findings heavily supported these claims whereby the only tangible benefit identified was to reduce operational costs such as marketing and transaction fees. The basis of this work shows that both Earl’s four-way framework and Irani’s appraisal techniques framework provide a firm footing to discover the justification for many of the electronic commerce web based applications that we see today.

8. Reference


