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Towards the Formulation of a Comprehensive Framework for the Evaluation of Investments in Sell-side E-Commerce

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'*The key question is not whether to deploy Internet technology - companies have little choice if they want to remain competitive - but how to deploy it*'
[Porter, 2001]

Abstract*: In recent years, whilst considerable attention has been focussed on the Internet, and in particular its potential as a sales medium, little research has been conducted into how such investments can be objectively evaluated. Based upon a review of the literature and a series of exploratory interviews, a provisional framework for evaluating e-commerce investments is presented. It is shown that in addition to considering generic issues such as flexibility and implementabilty, an e-commerce evaluation framework should address specifics, such as customer management, marketing and logistics.*

1. Introduction

Although the Internet was originally designed for the public sector, it is the private sector that appears to be most actively exploring and exploiting its potential. An increasing number of organisations are using the Internet as a marketing medium to communicate with wider global markets, while also creating closer relationships with potential customers. As Pyle (1996) notes, the Internet's *'global connectivity opens up new avenues for business in a manner that traditional commerce conduits cannot match'*. The advantages of this new electronic phenomenon appear obvious; easy access, low entry barriers, flexibility, ability to communicate large amounts of information, cost efficiency and easy maintenance (Doherty et al, 1999). Indeed, recent figures from the Boston Consulting Group (2001) suggest that by the end of the year, the B2C economy will have grown to $65 billion, in the USA alone. However, there is also much evidence that many e-commerce initiatives have resulted in failure. For example, the widely reported experiences of organisations such as boo.com, clickmango.com, e-toys.com, lastminute.com and letsbuyit.com have made it clear that the attainment of e-commerce success is by no means certain. Such levels of failure suggest that organisations might not be evaluating sell-side e-commerce investments as thoroughly as they should.

Information technology evaluation is a process that attempts to assess the contribution of an information systems investment. For example, Willcocks (1992) defines systems evaluation as the '*process of establishing by quantitative and / or qualitative techniques the <u>worth</u> of IS /*

IT projects to the organisation'. In terms of the timing of the evaluation, it is suggested that there are two key points at which the contribution is evaluated. Initially, the '*ex ante*' evaluation is conducted prior to systems development, to justify the investment, and then the '*ex post*' evaluation is undertaken following implementation, to confirm the value of the system (Remenyi et al, 1998; pp 55-56). To date, the vast majority of the literature, appertaining to the evaluation of e-commerce investments has focussed upon the '*ex post*' evaluation (e.g. Misic & Johnson, 1999; Simeon, 1999). There is therefore, a pressing need for research into the '*ex ante*' evaluation of e-commerce investments.

The emphasis of IT evaluations has typically focussed upon a system's financial or economic contribution. (Bacon, 1992). Moreover, Ballantine et al, (1996) note that '*studies have tended to concentrate on the financial techniques used to evaluate investments*', and that '*financial reviews of cost / savings*' are the most common aspect of evaluation procedures. Similarly, Farbey et al, (1999) note that the debate about systems evaluation has been primarily concerned with '*Value for IT money*'. However, many commentators are now questioning whether limiting the focus of evaluations to financial and economic considerations is appropriate, especially for significant and complex information system investments. For example, Guy Fitzgerald (1998) emphasises the need for an IS evaluation to address a wider issues, including risks, implementability, flexibility, organisational impacts and links to strategy. Farbey et al, (1999) also view evaluation as being a far broader activity. They have recently proposed the following definition: '*a process, or group of parallel processes, which take place at different points in time or **continuously**, quantitatively or qualitatively, to determine **all the impacts** of an IT project and the programme or strategy of which it is part'.* One of the key objectives of this research is, therefore, to explore whether an e-commerce evaluation should go beyond the scope of a cost-benefit analysis, and if so, what issues should it address?

In summary, the aim of this paper is to report on exploratory research, which seeks to investigate the importance, content and process of the '*ex ante*' evaluation of sell-side e-commerce investments. In so doing, a provisional framework for the evaluation of such investments is derived. The paper is organised into a number of distinct sections. The following section of this paper establishes the research objectives for this project, prior to reviewing the research methods. The research results are presented and discussed in the third section, before their importance is assessed in the final section.

2 Research Method

This section describes the method employed to explore the specified research objectives.

2.1 Design and Validation of the Interviews

Given that this research project's objectives are highly exploratory, in-depth personal interviews were chosen as the data collection method. This research strategy enabled insights to be gained into the respondents own interpretations and enhanced the

researcher's ability to understand underlying or latent issues (Miles & Huberman, 1994). A series of questions were devised and incorporated into a semi-structured interview guide, which provided a framework for explicitly addressing the stated research objectives, whilst also ensuring that all interviewees were given every opportunity to raise issues and highlight concerns. The interview schedule was sub-divided into two sections, the first of which sought to explore the importance, content and process of the e-commerce evaluation (see table 1).

The second part of the interview schedule investigated the specific issues to be addressed in an evaluation (see table 2). Whilst little work has explicitly been conducted to explore the process and content of evaluation approaches for sell-side e-commerce investments, much work has been conducted in related fields, which may be of relevance. For example, researchers, such as Teo *et al.* (1997), O'Keefe *et al,* (1998) and Doherty et al (1999) have conducted studies investigating factors that affect the adoption of the Internet for sell-side e-commerce. These studies have helped to establish the significance of factors such as product suitability, perceptions of the market, suitability of logistical/ technical infrastructure, availability of resources and clear strategic vision, in influencing the adoption decision. It is very likely that some, if not all, of these factors could be advantageously incorporated into an evaluation framework.

Table 1: The importance, content and process of the e-commerce evaluation.

Research Questions
Q1) How important is it for Organisations to formally evaluate sell-side e-commerce proposals, and why is this so?
Q2) Is a simple IT evaluation framework, which typically addresses costs and benefits, appropriate for the evaluation of e-commerce investments? If not, why not?
Q3) Some commentators [Fitzgerald, 1998] suggest that in addition to addressing costs and benefits, IT evaluations need to address a wider issues, such as risks, implementability, flexibility, organisational impacts and links to strategy. Should an e-commerce evaluation also address all of these issues?
Q4) Briefly describe the ways in which an e-commerce project differs from a traditional IT development project.
Q5) How successful, currently, are organisations are at evaluating e-commerce investments?
Q6) Who should be involved in the evaluation of sell-side e-commerce investment?
Q7) Are you aware of any specific tools, techniques or approaches that are particularly appropriate for evaluating e-commerce investments? Please describe each briefly.

The questions relating to the 'specific issues to be evaluated' were tackled in two distinct ways. In some instances, the respondent was presented with the framework (see table 2) and asked to discuss the validity of each item. In other cases respondents were asked to identify the issues to be incorporated and then to justify their inclusion. It was envisaged that

this two pronged approach would maximise the chances of a broad range of issues being explored. Once the draft structured interview schedule had been developed it was validated by pre-testing with an experienced e-business manager. This exercise focused upon identifying any problems with the focus, clarity and suitability of the questions. The pre-tests resulted in a number of important enhancements being made to the interview schedule, both in terms of wording and content, before it was ultimately utilised.

Table 2: The specific issues to be addressed in an evaluation

Element	Sources
Link to corporate strategy: It is essential that an e-commerce initiative is not carried out in isolation from an organisation's wider corporate objectives.	Porter (2000)
The business model: The long-term success of the web-site will ultimately depend upon the long-term relationship between operational costs and revenue streams.	Reymeni (2001)
Value Proposition: The web-site must demonstrably deliver benefits / value to the customers if it is to succeed.	Reymeni, (2001)
Marketing strategy: The success of the web-site will be predicated upon the effective acquisition of new customers. A marketing strategy, therefore needs to considered at the project's out-set.	DTI (2001)
Management of customers: It is important that mechanisms for developing long-term customer relationships are considered as the acquisition of new customers is generally far more costly than retention of existing customers.	Chaffey et al (2000)
Logistics / supply chain: The evaluation procedure must address the logistics requirements of the e-commerce investment, to ensure that all orders are satisfied in a timely and accurate manner.	Doherty et al (1999); Teo et al (1997)
Interfaces to existing systems: For established organisations, the success of a new web venture will be heavily predicated upon the ease with which it can be interfaced with existing order-processing, invoicing and logistics systems.	Teo et al (1997)
Brand management: Typically customers will only buy from a web-site if they trust the brand. Brand management is therefore an important aspect of an e-commerce evaluation.	Hart et al (2000)
Suitability of product: There is much research to suggest that some products, such as books and CDs, are better suited to the Internet than others.	O'Keefe et al (1998))

2.2 Targeting and Execution of the Interviews

As this work was very much exploratory in nature, a convenience sample was considered to be appropriate. Ultimately, nine individuals were selected, and persuaded to participate, based primarily on the relevance of their expertise, but also on their locality and availability. Whilst the sample size of nine is fairly small, it is considered to be adequate given the exploratory nature of the main objectives. Full details of the participants in the interviews and their organisational background are provided in table 3.

Table 3: A Summary of Interview Details

Interview Number	Position	Type of organisation
1	E-commerce Researcher	University
2	E-commerce Researcher	University
3	IT services Manager	Multi-national manufacturing organisation
4	E-business Manager	Multi-national pharmaceutical organisation
5	E-commerce Consultant	Multi-national consultancy organisation
6	E-commerce Consultant	Multi-national consultancy organisation
7	Senior Business Analyst	Large software development organisation
8	Consultant - includes responsibility for e-business	Consultancy for SMEs
9	Senior Business Analyst	Large software development organisation

Whilst most of the interviews were conducted verbally, either face to face or via the telephone, in some cases respondents preferred to submit their responses by email. In nearly all cases follow-up discussions (either face to face, telephone or email) were conducted to clarify issues or gain further detail. The results of the interviews were all recorded in a standard format and then analysed using both within-case analysis with cross-case analysis (Miles and Huberman, 1994).

3 Research Findings: The importance, execution and scope of approaches to the evaluation of investments in sell-side e-commerce

The findings presented in this section relate to the seven questions articulated in table 1.

Importance of formal evaluation procedures: When asked about the importance of formally evaluating a sell-side e-commerce proposal prior to its development, the respondents were in complete agreement that it is essential. As can be seen from the comments below, the main justifications for a formal evaluation related to the identification and avoidance of risks and the need to consider all the alternatives and their impacts:

'*Very important since the investment may be large, but the risks are high and the ROI is unclear. Also a range of solutions are possible from non-transactional sites through customer-service transactions to sales transactions. Need to link with overall business / e-business strategy.*' [Interviewee **1**]

'*Very important, a sell-side e-commerce project can have a significant impact upon an organisation's image, positioning and strategic performance. Consequently, if the project fails, the company's credibility can be generally undermined*' [Interviewee **2**].

'With an ever increasing pressure on budgets and a drive for shareholder value, we've got to spend, and got to be seen to be spending, wisely in the e-business arena, especially since the fall of the '.com' world'. 'The potential to waste money is enormous' [**4**].

'*It's very important to undertake a comprehensive formal evaluation because initial and ongoing costs can be high; implementation of new technology can, and does, affect many people; there is so much solution choice that comparisons should be made'* [**5**]

The appropriateness of a simple cost / benefit analysis: There was a high level of agreement that a simple cost / benefit analysis was probably not appropriate for the evaluation of e-commerce investments. It was acknowledge that '*the wider impacts [of the e-commerce initiative] will definitely need to be addressed'* [**4**] as an integral part of evaluation process. More specifically, it was suggested that the evaluation should also consider '*intangible costs and risks*' [**1**], *'links to strategy'*, issues of '*credibility and brand loyalty*' [**2**] and '*the organisation's relationships with its customers'* [**4**]

The appropriateness of the FitzGerald Framework: Some commentators suggest that in addition to addressing costs and benefits, IT evaluations need to address a wider range of issues, such as risks, implementability, flexibility, technical feasibility, organisational impacts and links to strategy [Fitzgerald, 1998]. As the following comments testify, there was a high degree of agreement, amongst respondents, that this more widely focussed framework is likely to be more appropriate than the simple cost / benefit analysis.

'*Definitely for all large-scale strategic or operational investments. E-commerce fits within these categories*'. [**1**]

It's getting there, but you must also take account of other issues, such as the legal and regulatory framework ,with in which the site will operate' [**3**].

'*Definitely. The issues above are normally the biggest issues within any IT project'* [**5**]

'*Yes, especially flexibility. Many projects have stalled as a result of not being easily scaleable and being unable to accommodate unanticipated demand for on-line services*' [**2**].

'*I think so - although the organisational factors could be broken down into how e-commerce would impact role design, training of staff, education of customers, communication channels internal and external (especially within a traditional bricks and mortar firm)'* [**6**].

The last point is particularly interesting, as it hints at the need to develop a wider evaluation framework, addressing a far wider variety of specific organisational impacts.

Differences between e-commerce and IT projects: If there are major differences between the requirements for an e-commerce evaluation and a more typical IT project appraisal, these might, at least in part, stem from the differences between e-commerce and IT projects. Consequently, respondents were asked to briefly describe the ways in which an e-commerce

project differs from a traditional IT development project. The most significant differences included *'the high impact of system failure'* [**1**]*; 'the costs tend to be higher, but potential benefits are larger'* [**5**] and the *'increased speed to market'* [**6**]. The complexity of an e-commerce evaluation was also noted; '*in many ways it is more like a new business proposition, than an IT evaluation*' [**4**].

Success of current evaluation approaches for e-commerce projects: As the following comments testify, there was a high degree of consensus about the poor track record of organisations in evaluating e-commerce proposals.

'*Poor judging from dot-com failures and the reduced profitability of traditional companies due to the high expenditure on e-commerce*'. [**1**]

'*The high levels of failure would suggest that organisations are not very good at evaluating e-business propositions'* [**3**].

'*Too many people jumped on the e-commerce bandwagon without understanding what they were doing. With the high profile stock market issues and with lots of people with burnt fingers, investors are now a lot more shrewd. However, just because they're more careful and take things slower, it doesn't mean their evaluations are any better.* [**5**]

'*We're still learning* [**6**]

Involvement in e-commerce projects: When asked about the participants in the evaluation of sell-side e-commerce investments, respondents were clear that the process should be inclusive rather than exclusive; '*A cross-functional team to ensure that any implementation suits the business needs*'. [**6**]. Suggestions for the range of participants included:

'*Senior Managers in Marketing, IT, Ops, Finance, MD/CEO and indirectly the customer, particularly for B2B'* [**1**]*'*

'*IT should facilitate / advise but this is basically a business proposition, which should be owned by marketing, sales, operations and most especially senior management'. 'Must also involve customers and investigate the scope for collaboration'* [**2**]

'*End users, CIO, internal IT professionals, board (limited involvement - depends on cost), consultants are sometimes used for impartial advice*' [**5**].

The availability of specific tools, techniques or approaches: Finally, respondents generally agreed that there were relatively few specific tools, techniques or approaches currently available, that would help them in the evaluation of sell-side e-commerce investments. The lack of specific tools, techniques or approaches, was well summed up by one respondent [**1**] who commented '*unfortunately not*'.

4 A Provisional Framework for the Evaluation of Investments in Sell-side E-Commerce

The aim of this section is to review respondents' comments relating to each of the items identified on the provisional framework (see table 2), before discussing any of their supplementary suggestions.

Link to Corporate Strategy: As Porter [2001] noted: '*if organisations are to make the most out of web-based technologies, it is important that they see the Internet for what it is an enabling technology - a powerful set of tools that can be used wisely or unwisely in almost any industry and as a part of almost any strategy*'. E-commerce initiatives must therefore be strategically driven. This view was universally supported by the respondents, As one interviewee [5] noted '*you have to look at e-commerce investments in terms of where they fit in with strategy*'.

Business model: Whilst the notion of the business model is by no means new*, 'it seems to have been overlooked or forgotten when would-be web entrepreneurs began to set up their operation'* (Reymeni, 2001)*.* However, there was general agreement from the respondents that the formulation of a business model, which clearly enumerates the developmental / operational costs and the revenue streams is a critical component of the evaluation. In many ways this activity equates quite closely to the traditional cost-benefit analysis. However as one interviewee [4] noted '*There is a cost-benefit analysis, similar to that used in a traditional IT evaluation, but it tends to be far more sophisticated*'.

Value Proposition: The marketing concept of the unique selling proposition, which articulates the '*the unique product benefit that a firm aggressively promotes in a consistent manner to its target market*' (Kotler et al, 2001; p 834), has given rise in the Internet world to the idea of the value proposition. Chaffey et al, 2000; p 493) define the '*value proposition*' as '*the benefits or value of a web-site that are evident to its users*'. A successful web-site needs to have a '*compelling and preferably unique reason why people want to come to the site and engage in the activity that it is offering*' (Reymeni, 2001). The respondents were very clear that a value proposition must be articulated at the project's outset. Moreover, the idea that the value proposition is unique is fundamental; '*web-site differentiation is absolutely critical*' [6]. This view was supported by another respondent [4] who noted '*the Internet is now getting very crowded, and you are fighting for customer time. Must therefore determine how we are going to get impact out there in that busy space and make our sites more prominent.*'

E-commerce marketing strategy: To be of any value '*a web-site and what it has to offer needs to be promoted actively and regularly*' (DTI, 2001). All organisations wanting to engage in electronic trading must therefore develop a strategy to direct the marketing and promotion of their sites. As one interviewee [7] noted '*how you get known in the market-place is critical. You must consider advertising, registering with search engines etc'*. One of the key issues is integration, '*the e-commerce marketing must be integrated with the organisation's wider marketing objectives'* [4] and '*the on-line marketing must complement an organisation's off-line marketing'* [3]. Whilst it is unlikely that a full strategy will be formulated as a part of the evaluation, it is necessary to consider strategic marketing issues, as these will have an important impact upon the sites ultimate success. '*Right up-front you've got to take account of the marketing strategy, as this will have a massive impact upon the sites operational costs, and ultimately its profitability'* [4].

Management of customers: It has long been recognised that the Internet provides an ideal mechanism for facilitating customer relationship management (Chaffey et al, 2001). It was also readily acknowledge by the majority of the respondents that an evaluation should consider the issue of customer management. Its importance was well summarised by one respondent [**4**], who noted that *'the web has the power to either destroy or significantly enhance the organisation's relationships with its customers'.* In terms of priorities, it was suggested that organisations must *'plan to ensure customers return to our site?'* [**8**] and *'must manage the after sales service'.* [**3**]

Logistics / supply chain / order fulfilment: It is essential that organisations evaluating a B2C web investment consider the issues of logistics and order fulfilment during the investment appraisal, as it is likely to have a significant impact on the project's feasibility (Doherty et al, 1999). For example, organisations must consider whether they have *'the infrastructure in place to handle the expected volume of business?'* [**7**]. If they haven't, an assessment must be undertaken to consider the costs and implications of developing such an infrastructure. Other issues to be considered include: *'the speed of delivery, the availability of stock and the returns policy'* [**3**]. A final issue to consider is how to ensure that the purchased products can be safely received by the customer. As one experienced e-commerce consultant noted: *'solving the "last mile" problem, facilitating the safe receipt of goods, is absolutely essential to the ultimate success of a web-site'* [**6**]. These issues are critical, because *'Any bottlenecks in order delivery will be hit quicker / exacerbated by e-commerce'* [**3**]

Interfaces to existing systems: The launch of a new customer facing web-site will necessitate the development of communication links between it and a wide variety of back-office systems. As one respondent noted, *'integration with other systems is important e.g. production, customer service/CRM and fulfilment systems also affect the customer directly'* [**1**].

Brand management: It is well recognised that an organisation's brand image will have a significant impact on the successful launch of a web-site and that the web-site can have a significant impact upon the brand (Hart et al, 2000)**.** It is therefore important that the issue of branding is considered at the evaluation stage, as there is the **'***danger of diluting / confusing brand, especially when going global'* [**3**].

Suitability of product: Some products lend themselves to Internet selling more readily than others (Doherty et al, 1999). The evaluation process must therefore question whether it is *'a product that lends itself to distance purchase, such as CDs or gifts, or is it one that requires a higher level of physical inspection, such as cuts of meat?'* [**8**]. Moreover, organisations must determine *'not only is the product suitable, but can the offer be differentiated?'* [**3**].

Other Issues: In addition to discussing the specific elements included in the provisional framework, respondents were asked to identify additional elements, which they believed to be important. Some of the more interesting of these included:

- **Assessment of competitive environment:** A number of the respondents highlighted the need to thoroughly audit the competitive environment. This entails a close scrutiny of the web activities of competitors, asking questions such as: *'are our competitors doing it already? are we loosing business to them?; can we borrow ideas from them? and how can we differentiate ourselves from the competition?'* [**7**]. The audit of the

environment also requires organisations to consider their target markets; '*who are our target market and do they use the Internet?'* [**8**]

- **Appropriateness of organisational culture:** One of the interviewees [**3**] highlighted the need to take account of the cultural change that the adoption of e-commerce is likely to engender. This point has also been noted in the literature, where Sid Fuchs (2001) warned of the dangers of '*focussing upon the new technology ignoring the need for modifications in culture and behaviour'.*

- **Security:** Security issues must be considered during the evaluation [**3**]**.**

- **Internal processes:** One interviewee [**8**] stressed the need to consider whether an organisation's '*internal processes would support a move towards e-commerce*'. In particular, the need to have expertise and systems in place to deal with returns and customer complaints was highlighted.

5 Discussion of Findings and Conclusions

The research presented in this paper makes a number of important contributions to the debate relating to the successful launch of customer facing web-sites, as it is one of the few papers that explicitly addresses the issue of *ex ante* e-commerce evaluations. More specifically, the importance of conducting formal evaluations has been under-lined, especially as e-commerce projects are generally viewed as being more sophisticated, more expensive and riskier than other forms of IT project. In terms of the content and process of the evaluations, it was unanimously agreed that the cost-benefit analysis is not a sufficiently comprehensive or sophisticated tool for conducting an evaluation, although a thoroughly costed business model does form an important part of the process. There was, however, far more support for the idea that FitzGerald's (1998) multi-dimensional framework might provide a more complete approach, although its organisational impacts would need to be specified at a more detailed level.

These findings generally support our initial view that there is a pressing need to develop a more comprehensive framework for the evaluation of sell-side e-commerce investments. It should be noted that whilst the e-business focus of the framework is new, it still draws heavily on the work of FitzGerald (1998). The components of this framework, which have been discussed in section 4, have been presented graphically in figure 1. The central notion is that an analysis of the competitive environment, product suitability and links to corporate strategy should determine whether there is a *prima facie* case for an e-commerce web-site. If there is, then it is necessary to consider a range of organisational, marketing and technical issues in more detail. The aims of this exercise are twofold, firstly to consider the system's likely impacts to ensure that they are acceptable and to plan any necessary organisational change, and secondly, as a necessary pre-requisite to building a sophisticated business model. In parallel to considering a range of impacts, and building a business model, the evaluation team would also need to be considering some of the more generic issues, such as flexibility, implementability and risk. In terms of the process of the evaluation, this research has demonstrated strong support for the philosophy that evaluation should be an inclusive process. There was also recognition that the process might be fairly continuous.

One e-business manager [4] described an approach by which preliminary screen '*mock-ups*' of the web-site would be reviewed and critiqued by a range of managers [e.g. brand, marketing, logistics and legal] prior to the investment decision being made. Once the go ahead for the project was given, more detailed mock-ups or working screens would be regularly reviewed by groups of managers to provide an on-going evaluation of the system.
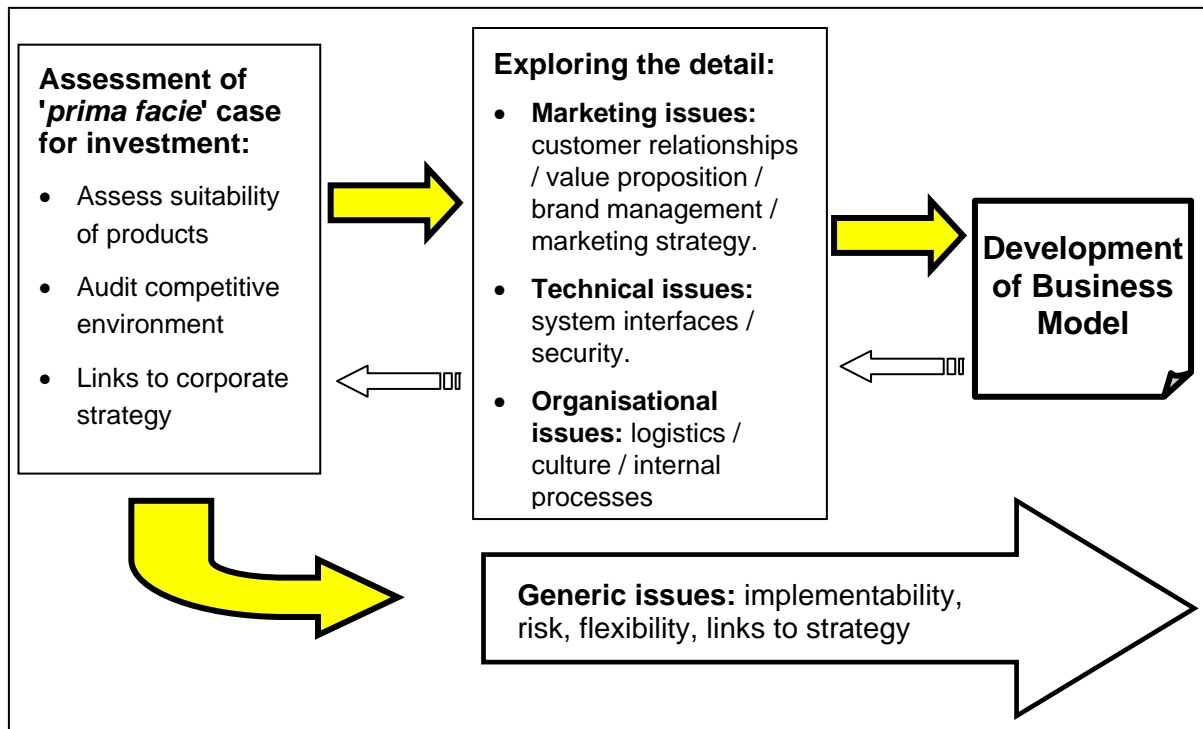

Figure 1: Provisional Framework for E-commerce Evaluation

A health warning must be given with respect to the findings presented in this paper, they are provisional and exploratory. The aim of the paper was at least in part, to stimulate a debate and generate feedback. The next stage will be to engage in further, more detailed interviews and case studies, so that the ideas, with respect to the content and process of the framework, can be validated, enhanced and further expanded.

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