

Understanding the Role of Strategy: An Exploratory Study of Eliciting E-business Requirements for SMEs

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Abstract

A healthy and vigorous SME sector is recognised by the UK Government as a cornerstone of economic growth and prosperity for the nation. It has also been recognised that the transformational power of e-business is fundamental to achieving sustained growth within the sector and maintaining national competitiveness in an expanding global market. However, there is significant evidence that SMEs are failing to reap the anticipated benefits of e-business and that over the last three years they have been 'clicking off' in increasing numbers. Evidence is presented from the literature which indicates that this phenomenon is due to a lack of strategic perspective and vision from which SME owners or managers can draw clear requirements for their e-business initiatives leading to a communications gap between themselves and developers. This is an area of study to which little research effort has been dedicated. Therefore in order to verify the existing literature and to explore potential solutions the preliminary results from three case studies are presented. The results indicate that a 'communications gap', does exist between developers and SME managers or owners and is caused by the inability of clients to effectively articulate their e-business vision confounding the process of requirements elicitation. The results also demonstrate that a clear business strategy can facilitate the elicitation of requirements for a successful e-business solution. From the results of the investigation a preliminary framework is suggested to support this process, which will inform SME management and provides a basis for future research.

Key Word: E-business, SMEs, strategy, requirements.

1. Introduction

The strategic importance of a healthy and vigorous Small and Medium sized Enterprises (SME) sector to national economic growth and prosperity has been recognised by many governments. SMEs are seen as the *'life blood of modern economies'* and instrumental in maintaining national competitiveness within the global economy (Rao, Metts, and Monge 2003, Blair 1999). It has also been recognised that the transformational power of e-business is a fundamental requirement to a competitive and therefore a healthy SME sector (PIU/SBS 2001). Evidence is accumulating that strongly suggests that businesses must develop and implement e-business strategies if they are to remain competitive and thrive in the long term (Sparkes and Thomas 2001, Quayle 2003).

The UK Government in recognition of the importance of e-business launched, among other initiatives, UK Online, who stated in their first annual report:

"Electronic Commerce and the Internet are transforming economies and societies across the world. The Government is committed to giving every individual, business and community in the UK the opportunity to participate fully in the benefits flowing from these changes – in short getting the UK online."

(UK Online 2001, p.4)

The synergies that can be realized by combining these potent forces for economic growth are so significant that, as Adam et al. (1998, p.6) argue, until SMEs fully participate in e-business the *'potential for ubiquitous improvement of commercial activities'* cannot be achieved. However, despite the improved position of the UK to 3rd place behind Sweden and Ireland for IT sophistication in Europe (DTI 2004), much of which is attributable to micro and small business adoption of IT, there are still significant problems. Jim Norton (Senior Policy Advisor) of the Institute of Directors relates that *'the area where the UK is still lagging is usage - we now have plenty of infrastructure and so on but not so much usage'* (Arnott 2004). This statement is supported by a DTI (2004) sponsored survey, which indicates that the trend of *'clicking off'* by small business has continued for the third successive year. The report also identifies that the digital divide between larger and smaller businesses is widening (DTI 2004) with many SMEs failing to reap the anticipated benefits of e-business and regarding their initiatives as partial if not complete failures (Burn, Marshall and Barnett 2002, Scott and Edwards 2004 and Fillis, Johansson and Wagner 2004).

Evidence is presented from the literature that this phenomenon is attributable, to a significant degree, to a lack of strategic perspective from which clear e-business requirements can be drawn and forms the basis for this exploratory investigation. Preliminary results from three case studies are then presented. Company A is a small but well respected company based in the North East of England employing approximately 20 people. It has a national reputation and extensive experience of supplying e-business solutions: it is concerned by the degree of difficulty encountered when attempting to elicit e-business system requirements from the owners or managers of its SME clients. Company B is a light engineering manufacturing business attempting to revitalise a

failing e-business initiative. Company C has recently developed an innovative process and successfully deployed phase one of a two phase e-business strategy, which is intrinsic to the success of the business. Emergent themes are drawn regarding (i) the problems faced by Company A in determining the e-business system requirements for SMEs and (ii) how these problems have been tackled by two manufacturing companies at different stages of developing their e-business solutions. From these preliminary results the future direction for the research is then indicated.

2. Literature

Immediately after the dot.com crash of 2000 the literature offered little guidance, based on empirical research, regarding the causes of e-business initiative failure. This is to be expected given that it is a relatively recent phenomenon. However, at the time there was comment in various press articles, which attributed failure to issues such as scalability, adaptability, reliability and proprietary code (IDC 2000). However, a more serious but non technical issue was identified which contributed significantly to this phenomenon. A General Management Technologies (GMT) survey found that of the 116 executive respondents 62% regarded their e-business initiative as unsuccessful. Two of the major reasons given for failure were:

1. Managers failed to understand how to apply e-business tools in the 'new economy'.
2. 52% of the companies reporting failure regarded weak strategy as the primary cause.

(GMT 2000)

Furthermore in a survey of City Analysts it was also reported that a lack of effective management and effective business strategy contributed significantly to e-business failure (Cohn & Wolf 2000). These views are supported by several eminent authors including Porter (2001), Venkatraman (2000) and Turban et al. (2004) who contend that the prerequisite of a successful e-business initiative is the development of business strategy, characterised by a simple and clear vision of what is to be achieved. The most critical factors in achieving this being strategic thinking and vision.

Whilst the issues mentioned above could provide some useful guidance, their relevance for the smaller business could be questioned. However, there is a small body of evidence which indicates that the main cause of e-business integration failures in SMEs is attributable to the underestimation of the strategic implications of e-business (Dimitriadis et al. 2003). Pease and Rowe (2003) present evidence that this is the result of poor business management characterised by a lack of strategic direction, perspective and vision. In a series of case studies they found that in SMEs there is a propensity to focus on the operational matters at the expense of strategic direction. Further, a survey of 231 small businesses by Quayle (2003) supported these findings when it was found that 75% of the respondents did not have an e-business strategy.

There is evidence in the literature that the lack of a clear e-business strategy during the requirements elicitation process for e-business initiatives results in the creation of a

'communication gap' between client and consultant (Elsammami, Scown and Hackney 2001 and Scott and Edwards 2004). Communicating requirements to the developers was found to be extremely problematic and emotive, with respondents indicating that developers did not interpret instructions well and were prone to imposing their own view upon the solution. This can be illustrated with the words of one respondent in Scott's study (2003) who after several attempts to have significant corrections made to his web site exclaimed: '*because they are technocrats, they think they know better than us*' and '*we must be speaking Japanese when we talk to them*'. Respondents also believed that their lack of technical expertise compared to that of the developers contributed significantly to the communication gap. The respondents also felt that the developers seemed to be concerned with what they could achieve technically rather than with ensuring that the solution fulfilled the clients' requirements (Bode and Burn 2000 and Scott 2003). Under these circumstances it seems hardly surprising that SMEs are often disappointed with the effectiveness of their e-business initiatives.

In defence of developers it must be said that '*frequently the customers cannot specify exactly what they want*' (Segelod and Jordan 2004).

Against the background of SMEs failing to reap the anticipated benefits of e-business and a continuing 'clicking off' trend this paper seeks to explore the issues with a view to providing some guidance for the successful implementation of e-business initiatives and to provide a foundation for future research.

3. The Methodology

It was decided to adopt a case research strategy as it is particularly well suited to the study of and capture of knowledge, which practitioners employ (Benbasat, Goldstein and Mead 1987). The case study approach has the added advantage that it may involve single or multiple cases and it also has the capacity to allow multiple levels of analysis within each study (Leedy 1997). Three main lines of enquiry were established in order to identify and explore the initial facets of the problem using open-ended interviews and structured communications.

1. The first main line of enquiry was established with a small business of national reputation and extensive experience in the supply of e-business solutions to SMEs (identified as Company A). Company A provides an external view of the management and quality of strategy development within the SME with whom they are engaged. It illuminates an important element of the study as discussed in the previous section.
2. The second main line of enquiry has two goals and concerns a local light engineering and manufacturing SME employing over 200 people (Company B), which had embarked on a simple e-business strategy. A web site had been set up as a means of advertising the products and services of the firm, but it proved to be of little benefit to it. The firm was reappraising its e-business strategy in an effort to stimulate sales and reduce costs in the face of an increasingly competitive market. Scott was engaged in monitoring the process with the co-operation of the

- IT Manager and the Financial Director. The position of IT Manager had been a recent addition to the staff complement. Prior to this appointment the management of the IT systems had been outsourced. This case study has two focuses of investigation:
- a. To establish the events leading to the deployment of the existing web site.
 - b. To explore the motivation behind the initiation of a new e-business initiative and to examine the processes employed by the business during the planning phase of the project.
3. The third main line of enquiry also has two goals and involves an SME, which employs approximately 25 people (Company C). This firm is engaged in manufacturing and is founded upon a unique and innovative process. The Company has deployed a business to business web site and extranet, which has met the expectations of the management and fulfilled the objectives of the first phase of a two-phase deployment strategy. Phase 1 saw the development of an Intranet to enable customers to place orders and receive product quickly. The responsibility for implementing the firms Internet strategy rested with one of the partners who had extensive IT knowledge and was designated as E-Business Manager. The focuses of this case study was to:
- a. To establish the rationale for the development of an e-business solution.
 - b. To retrospectively analyse the processes engaged in by the business during the planning and implementation phases of a successful e-business initiative.

4. Preliminary Results

4.1 Company A

The main area of concern that the development team had was the difficulty in determining what the clients actually wanted. This was considered to have a detrimental effect on the client's final product and considerably influenced the productivity and profitability of the company. It was also noted that the opportunity for repeat business was dependent to some considerable degree on the quality of the solution in operation.

The development team felt that one of the major factors contributing to the clients inability to express what they wanted was that they were often unaware of the technical capability of information technology. Clients were noted to display an adept grasp of the technology relating to the tools that they use, and those that supported their administrative systems. However they often failed to grasp the fundamental difference that exists between e-business information systems and traditional business systems. As Gordijn, de Bruin and Akkermans (1999) noted this difference lies in the degree of integration which exists between the business model and business processes and the degree to which they are supported by ICT /IS. The traditional business system is seen as being supported by ICT and IS whereas in 'e-business' ICT / IS are inseparable from the business model. In essence the processing of business information and transactions has been virtualised and the systems are no longer limited to the role of business support but

become the sole means of executing those processes. The development team's view was that failure to grasp this concept could result in the client:

1. Under specifying requirements, which can lead to continually changing requirements as expertise is gained as the project progresses or dissatisfaction with the final implementation.
2. Overestimating the capability of the technology given the financial constraints for the project.
3. Being unable to articulate what the business requirements are.

These problems are not unfamiliar in the process of requirements elicitation and represent problems of scope, understanding and volatility (Christel & Kang 1992). This demonstrates the existence between the supplier and client of a fundamental and damaging 'communications gap' which must be overcome if the resource utilisation of the participating companies in an e-business project is to be optimised.

Further investigation revealed that in the development team's experience many of the problems they faced in their repertoire of projects were due to:

1. SME owners or managers failing to prepare a business plan or some other form of documentation giving clear objectives for their e-business initiative. This occurred in almost all cases
2. SMEs failing to have an IT manager or other IT competent personnel within their businesses. This occurred in all cases.
3. Unrealistic time frame for getting to the market quickly, which had a detrimental effect on the implementation. This occurred in over two thirds of cases.
4. Financial constraints compromising the solution to the extent that it did not fully match the clients initial requirements. This occurred in approximately two thirds of cases.

Operating under these constraints was considered to adversely affect the opportunity for a successful outcome to the initiative to a considerable extent. The first two factors were believed to fuel the 'communications gap' and therefore undermined the process of gathering requirements effectively. The latter two factors reflect issues that were they to remain unresolved during the project life cycle as a result of the 'communications gap', would further undermine the prospects of a successful outcome.

The problems associated with items 2,3 and 4 are not confined to the domain of e-business projects, but are common to IT / IS projects in general. The distinguishing factor between e-business projects and IT / IS projects is the requirement for a business plan or some form of documentation detailing the business's strategy. It is used to provide clear business objectives upon which outline requirements for the initiative can be based (and subsequently assessed) as illustrated in the remaining case studies. These issues reflect the observations regarding the reasons for e-business failure reported by GMT (2000),

Cohn & Wolf (2000), Dimitriadis et al. (2003) and Pease and Rowe (2003). It also illustrates the importance of the degree of integration between the technology and the business model as stated by Gordijn, de Bruin and Akkermans (1999).

4.2 Company B

In the case of Company B it was noted that the initial and relatively unsuccessful initiative to implement an e-business strategy was founded upon a marketing initiative. An external supplier developed the web site and the motivation behind the initiative had little focus other than to provide a simple online advertising presence accompanied by an enquiry form. There were no detailed objectives, performance criteria or requirements specified.

The appointment of an IT Manager coupled with deteriorating market conditions initiated a sequence of events, which has resulted in methodical approach to the problem of re-invigorating the e-business initiative. Pressure on sales and margin has provided the motivation to investigate options which would stimulate sales and reduce costs throughout the business. The IT manager supported by the Finance Director prepared an exploratory e-business report, which included recommendations to carry out the following steps:

1. Establish an E-business Initiative Team led by a manager from the highest level within the company. Its members to include leading individuals from each of the key functions in order that informed decisions may be made regarding the remaining steps.
2. Conduct an internal analysis of strengths and weaknesses of the firm. This includes an evaluation of the existing IT systems and how they, and non-IT supported business processes, interface with administration, accounting, inventory control, production, design and external stakeholders.
3. Conduct an external analysis of the opportunities and threats that face the firm with regard to its immediate environment (a) and the macro environment (b).
 - a. Its immediate environment: this includes an analysis of current customers and suppliers and competitors and a review of potential substitute products, new entrants to the market, e-business initiatives undertaken by competitors, customers and suppliers.
 - and
 - b. The macro environment: this includes a review of opportunities and threats due to technological change and the increasing momentum toward globalisation (new markets and new competitors).
4. Develop an appropriate e-business model to initially augment and eventually transform the current business.
5. Outline the e-business requirements of the business
6. Develop detailed requirements in cooperation with either:
 - a. In-house resources.
 - b. Outsourced expertise.
 - c. A combination of both.

7. Plan the implementation of the project and ensure budgetary control. This includes identifying key quantifiable objectives for the short, medium and long term.
8. Initiate project risk mitigation by:
 - a. Implementing the initiative over a number of phases regularly monitoring and reviewing progress.
 - b. Designing an extensive testing phase particularly for mission critical aspects of the system to ensure that:
 - a. It meets the need of the target audience.
 - b. All components operate successfully together.
 - c. It works under the full pressure and load of the real environment.

The key change, which Company B has undergone, is one of a change in motivation. Due to market pressures the reason for engaging in e-business has evolved from an imprecise marketing concern to one of measurable objectives. This has precipitated a formal process aimed at developing a suitable solution derived from a review of the business's strategy.

4.3 Company C

The Board of Directors considered their manufacturing process, which had been developed by the company, to be unique and innovative with substantial market potential. In order to take advantage of the competitive advantage intrinsic to the process the board set about developing an appropriate strategy. As this was a business start-up this process was not encumbered by legacy systems. Therefore the initial steps were undertaken to:

1. Identify and assess potential customers.
2. Identify and assess potential suppliers.
3. Identify and assess potential competing technologies and competitors.

It was determined that whilst there were competing technologies Company C was confident that their process was more economic and produced better quality product. It was also clear that the customers interested in the product were geographically diverse and had well-established e-business capabilities. This was also found to be true of the suppliers who were identified as preferred trading partners.

The Board subsequently decided that an 'Internet strategy' was of crucial importance to the company's future. In outline the strategy included:

1. Adding value to the customers experience by providing a facility for customers to access to a master catalogue of a full range of products, and the ability to create new designs in a secure location of the company's server.
2. The capacity to integrate with customer systems for the purposes of ordering, order monitoring, account settlement and fulfillment.
3. The capability to integrate with retailers and wholesalers.
4. The ability to build to order, achieve fast turnaround and integrate with the customers supply chain.

5. The capacity to integrate with downstream suppliers for procurement and account settlement.
6. The solution is to be fully scaleable and adaptable.

This high-level design brief was then used as a framework to prepare a Project Definition Document. The responsibility for this was allocated to the E-business Manager and support during its preparation was provided by an external consultant identified after discussions with a number of third party solution providers. The document gave detailed consideration to:

1. The objectives of the project.
2. Project strategy the decision to:
 - a. Recruit and build in-house.
 - b. Outsource the project.
 - c. A combination of both. (This was the solution selected).
3. Selection of the project team and responsibilities.
4. Key milestones.
5. Site design proposals.
6. Test phase.
7. Final site layout.
8. Security requirements.
9. Web site reliability.
10. Identification and selection of ISPs
11. Data protection considerations.
12. Marketing, both traditional and web based.
13. Site deployment and post implementation assessment
14. Future development plans.

The Project Definition Document then formed the framework for the Requirements Definition Document Version 1, which was prepared by the Project Team. By this stage it had been determined that the development would be outsourced and with internal staff providing maintenance.

Version 1 of the Requirements Definition Document was then used as a framework to develop a detailed Requirements Definition for the complete project in co-operation with the third party solutions provider. Both parties placed considerable emphasis upon developing and understanding the requirements and 25% of the development time utilized in Phase 1 was dedicated to the process.

During the remainder of the Phase 1 development life cycle the requirements were subject to formal regular reviews and updated accordingly. Phase 1 was consequently delivered on time, within budget and after two months of operation was very well received by customers.

In this case the business strategy and the 'Internet strategy' are inextricably linked. The high-level design brief has been developed directly from the strategic objectives of the organization by the board and the E-business Manager. By drawing in further expertise

the high-level design brief was transformed over a number of stages into the detailed Requirements Definition. This in turn resulted in the implementation of a system, which satisfied both the management of Company C and its customers.

5. Emergent Themes

Investigations conducted with Company A, a third party e-business solution provider, identified the existence of a fundamental and damaging 'communications gap' between themselves and SME clients. The 'communications gap' was demonstrated by observation that clients were often unable to specify their requirement or at best, over-specified or under-specified them. This was due to clients failing to appreciate the degree of integration which exists between the business model and ICT / IS technology as the means of executing business processes. The requirements elicitation problem is exacerbated by the failure of clients to evaluate the motivation sustaining their need for an e-business solution and failing to provide a business plan from which clear and measurable objectives can be drawn for the project. In almost all cases this coincided with the absence of an IT Manager or other IT literate person within the SME's business. In the experience of the supplier, these factors contributed significantly to overly optimistic and unrealistic expectations regarding implementation time frames and costs and finally results in the failure to realize the benefits of e-business.

Company B had suffered a lack of clear focus for their e-business strategy, which had been resolved by a combination of market pressures and the appointment of an e-business aware IT Manager and Finance Director. This had resulted in a structured and formal approach to developing an e-business strategy with clear business objectives in line with the reviewed strategic needs of the company.

The case study involving Company C demonstrated that the process advocated by Company B could result in the implementation of a successful e-business solution. This was dependent upon developing a high-level e-business design brief founded upon a thorough appreciation of the company's strategic goals. Using the high-level design brief as a framework, considerable emphasis was placed upon developing requirements in increasing levels of detail with each iteration of the process. This was continued during the remaining stages of the project life cycle for that Phase until a final version had been agreed.

By mapping the plans of Company B against the actions of Company C a number of common steps are identified in Table 1.

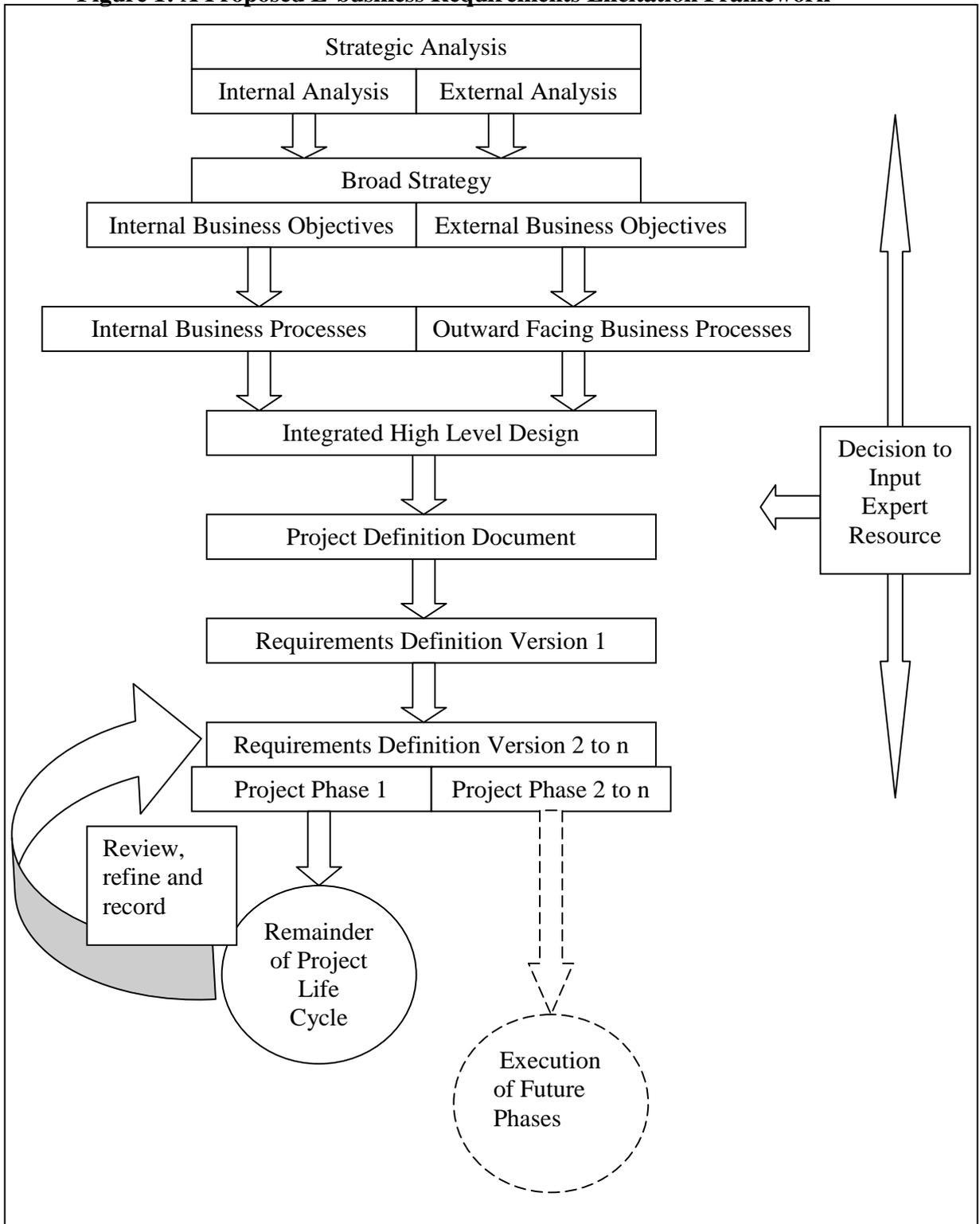
Table 1: Comparative Analysis of Emergent Themes in Company B and C

	COMPANY B - PLAN	COMPANY C - ACTION
1	Establish E-business Strategy Team	Board of Directors
2	Strategic Analysis of internal and external environmental factors	Strategic Analysis of internal and external environmental factors
3	Develop broad strategy	Develop broad strategy
4	Identify key internal and external business objectives	Identify key internal and external business objectives
5	Develop high level model with key internal and external processes	Develop high level design brief with key internal and external processes
6	Outline requirements	Project definition document
7		Initiate project team
8	Determine project development strategy	Determine project development strategy and identify third party solutions provider
9	Develop detailed requirements	Project team establishes Requirements Definition Version 1
10	Project planning and risk mitigation	Project Team reps and solutions provider develop Requirements Definition V2 to n Allocating tasks to Phase 1 to Phase n of Project.
11		Review, refine and record changed to Requirements Definition during remainder of project life cycle until final version of the requirements definition

The case of Company C demonstrates that a business strategy and a successfully implemented e-business solution that were inextricably linked and interdependent. By drawing upon the emergent themes in Table 1 a more general structure can be proposed (Figure 1), which may help to alleviate some of the problems associated the 'communications gap' experienced by Company A, thereby improving the process of requirement elicitation and subsequently reducing the degree of 'realization disparity'.

The framework illustrated in Figure 1 places the emphasis upon the client to develop the strategic analysis as far as their competence will allow since their intimate knowledge of the business domain cannot be easily simulated by a third party. The risks and rewards associated with the decision to introduce expert assistance at an appropriate point in the framework must lie with the client.

Figure 1: A Proposed E-business Requirements Elicitation Framework



A comparison between the typical Systems Engineering hierarchy (Pressman 2000) and the above framework reveals a significant difference. Information Strategy Planning (ISP) 'views the entire business as an entity and isolates the domains of the business (e.g. engineering, manufacturing, marketing, finance and sales) that are important to the overall enterprise (Pressman 2000). However, this is an almost entirely internal focus, whilst the framework above requires the identification of internal and in particular external processes in order to develop an effective e-business solution. It is this crucial difference, which must be addressed as developers struggle to gain insight into the problem domain. A soundly motivated and well articulated business strategy with clear objectives provides the opportunity to establish a foundation for good communications. This in turn provides the foundation upon which a requirements definition can be mapped and assessed against the strategic need of the business.

It is acknowledged that drawing general conclusions from observations made in these preliminary case studies would be unwise. However, the observations do provide some illumination on this relatively unexplored area and provide the basis for future research.

6. Conclusion

Five years after the dot.com crash and the subsequent recovery SMEs are still failing to reap the anticipated benefits from e-business. The literature indicates that a significant contributory factor is the failure of SME owners and managers to generate a strategic vision and clear objectives for their e-business initiatives. This often leads to a 'communications gap' between the client and the developer, which undermines the development of appropriate requirements for the project. Thus it is not surprising that the 'clicking off' trend continues and the digital divide between larger and smaller business continues to grow. Therefore the purpose of this paper was to report exploratory investigations into the difficulties encountered by an e-business solution provider to SMEs and the experiences of two SMEs engaged in e-business initiatives in order to develop an understanding of how these problems could be overcome.

The emergent themes from the first case study (Company A) confirmed the existence of a fundamental and damaging 'communications gap' between the developer and the SME clients. Clients were often unable to specify their requirement or they would over-specified or under-specified them. This was due to clients' failure to appreciate the degree of integration, which exists between the business model and ICT / IS technology as the means of executing business processes. The requirements elicitation problem was exacerbated by the failure of clients to evaluate their need for an e-business solution and failure to provide a business plan from which clear and measurable objectives could be drawn.

The case studies involving Company B and C revealed a series of steps which were taken by both of these companies to circumvent the problem. The plans of Company B were mapped to the actions of Company C, which resulted in the synthesis of a preliminary framework for the elicitation of e-business requirements. The framework places the emphasis upon the SME management or owner to initiate the strategic analysis in order to

exploit their intimate knowledge of the business domain, which cannot be easily reproduced. The emphasis again is placed upon the SME to introduce expert assistance when such need is established. However, this framework, whilst capable of providing general direction, only illuminates a rather unexplored area and provides the basis for future research. The future direction of this research will be to explore the processes and relationships which develop between third party e-business solution provider and their clients. By engaging in the technique of 'process benchmarking' it is anticipated that in depth analysis will reveal best practice, which will ultimately benefit SMEs engaging in e-business and increase their chances of success.

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