



Quality Introduced: The Key to E-commerce Systems Success

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ABSTRACT

Predictions of the economic windfall e-commerce is expected to bring to business has lead to a reactive surge of businesses wanting to take their business online. However, businesses are only seeing the potential gains that can be made through this new business medium, not the potential loses. In the haste for businesses to get online and for developers to get businesses online, several critical issues are, for whatever reason, being ignored. This paper is based on surveys of potential e-commerce consumers and interviews with e-commerce developers. It presents an e-commerce system success lifecycle that both business and developers can apply to ensure that their e-commerce systems are a business success. It introduces the idea of information systems quality into the e-commerce development lifecycle thus providing a more holistic approach to the selection, development, and operation of an e-commerce system. The guidelines presented in this paper provide a framework that it is hoped will lead to future e-commerce systems that offer a higher quality of success to business and, as a result, become more widely accepted and used by consumers.

1. INTRODUCTION

Electronic commerce (e-commerce) can be defined in a number of ways depending on the scope of inclusion you wish to encompass. For the purpose of this paper e-commerce is defined as the use of browser-based sites created by businesses for the purpose of selling goods and services to consumers over the Internet. E-commerce provides advantages for both consumers and for businesses. Experts such as Tilson (1998) and Bolin (1998) have identified three main advantages that e-commerce will bring to consumers: the broad selection of products; better and more complete information; and, lower prices. Advantages for businesses include: lower purchasing costs; reduced and more accurate inventory; lower cycle times; improved customer service; lower sales and marketing costs; and, new sales opportunities (Bolin, 1998). These envisaged benefits have companies hastening to establish an e-commerce operation. This flood of interest is fueling extreme predictions of e-commerce growth and profitability. E-commerce growth has to date been very strong. In May 1997, global e-commerce generated \$750 million in sales; in May 1998 that figure had grown to \$2.3 billion, a 205% increase (IDC, 1998). IDC, ActiveMedia and Forester Research all estimate that global e-commerce revenue will exceed one trillion dollars by 2003 (Rohn, 1998).

However, the majority of e-commerce revenue is generated through business-to-business (B2B) e-commerce. Business-to-consumer (B2C) e-commerce growth has been slower than predicted and accounts for a very small portion of the e-commerce pie. In the United States B2C e-commerce constitutes only 0.5% of overall e-commerce business (Van Slyke, 1999b). Numerous reasons for this slower than predicted uptake of B2C e-commerce have been identified. Issues identified most often and having the greatest effect include: high Internet access costs; a lack of PC's in homes; consumers lack of trust in the Internet as a business medium; concerns about security and privacy; and, the lack of government regulation (Bolin, 1998);(Wang, Lee et al., 1998);(Ackerman, Cranor et al., 1999);(Borenstien, 1996);(Tilson, Dong et al., 1998).

This paper proposes a link between the success of e-commerce (in terms of consumer acceptance) and the systems development approach adopted by the developers. In other words, the systems development lifecycle that is being used to create B2C e-commerce offerings causes some of the problems associated with consumer acceptance of B2C e-commerce. Lynch (1987) identified similar problems with the development lifecycles used in the

development of packaged software in the 1980s. Lynch highlighted a misalignment between the users' development lifecycle and the vendors' development lifecycle as the cause of the problem. Similarly, this paper identifies a misalignment between the lifecycles of the client, the developer and the user. A change of attitude for developers and their clients is needed with regards to the development lifecycle before there is an increase in acceptance of B2C e-commerce.

The premise of this paper is that for the successful development of high-quality e-commerce systems, developers need to recognise that e-commerce system development should not be conceptualised as software development, rather as information systems development. To ensure and deliver a successful and high-quality e-commerce system there are a number of critical success factors that need to be met. These success factors can be discussed in terms of the traditional lifecycle phases. However, for the purpose of this discussion the six traditional phases of the development lifecycle have been abstracted to a higher level. These three reconceptualised phases are derived from the traditional six-phase development lifecycle and incorporate an aspect not conceptualised in the traditional six-phase development lifecycle. This aspect can be thought of as the impetus for the development of the e-commerce system: a business makes the decision to establish an e-commerce site based on the premise that this venture will be a successful one. To ensure this success the three phases of investigation, development and operation are all essential considerations when developing a successful and quality e-commerce system.

2. RESEARCH FOR THIS PAPER

Problems were identified in a research study that looked at consumers' perceptions of trust in e-commerce systems and the systems development lifecycle that e-commerce systems developers are using. Research data for this study was obtained through two mediums: surveys and interviews. Surveys completed by two hundred and sixty six potential e-commerce consumers were used to gather users' perceptions of trust in e-commerce. Interviews were conducted with eight developers of e-commerce systems to determine the systems lifecycles being used and how developers address the critical issues related to e-commerce systems success. A thorough review of available literature was used to determine the critical issues of B2C e-commerce, thereby providing focus and

direction for the issues being investigated by the study.

3. E-COMMERCE SYSTEMS DEVELOPMENT LIFECYCLE

Researchers such as Boynton (1994) maintain that e-commerce has the potential to improve productivity, increase cash flow, decrease inventory and enhance customer relations. However, it also has the potential to damage consumers' perceptions of an existing business (Spool, 1998). In the stampede of business to embrace e-commerce, valuable lessons that have been learned over the years about strategic information systems (IS) planning, systems development and quality management are being forgotten. Businesses are jumping on the e-commerce bandwagon without first investigating whether it is a sound strategic business decision for the business (Dutton, 2000). Developers are guilty of not using a systems development lifecycles or only partially using one in the development of e-commerce systems (Dutton, 2000). Developers are also producing systems that do not consider the factors that have been identified as critical to e-commerce systems success (Dutton, 2000). E-commerce needs to be considered a strategic information system because it enhances competitiveness through the use of computer based information systems (Cash, McFarlan et al., 1992); (Clemons, 1991); (Ives and Learmonth, 1984); (Runge and Earl, 1988). It is therefore important to understand the anticipated benefits that prompted the business to initially implement e-commerce. This research will show that e-commerce systems are being developed by short-cutting the established process of strategic IS planning. Discussion of this topic will occur in section four of this paper.

The development of an e-commerce system needs to be viewed as the development of an information system, not as a software product. Software development focuses on the process of production, whereas information systems focus on the use of the system in a context. This view directly affects the quality of system produced. Vidgen, Wood-Haper, and Wood (1993) illustrate the differences between the production view of systems quality and the use view of it by emphasising the importance of user perceptions: 'quality is contingent and resides in the user's perceptions of the product'. Further discussions regarding systems quality can be found in section four.

There are several different models for systems development, each placing emphasis on different phases and issues. It is commonly accepted by software developers that each of the development life cycles have six main activates, which include: analysis; design; implementation; testing and evaluation; installation; and maintenance. This paper views the development lifecycle at a higher level of abstraction and identifies three main phases. These phases include investigation, development and operation. It is therefore likely that the findings will be valid for an e-commerce systems development using the waterfall, spiral or prototyping models. E-commerce systems development presents problems in each of these three phases.

This paper is structured around the following sections: section four explores the investigation phase, identifying this phase as critical to the success of any e-commerce system. It focuses firstly, on the strategic information systems planning required for e-commerce system success and secondly, it considers the analysis phase of systems development and the use of information systems quality in the development of e-commerce systems. Section five focuses on the development phase. The development phase includes the design, coding and testing phases of systems development. This phase is also critical to the success of an e-commerce system.

Issues of usability, security, privacy and branding, as well as the role of information systems quality in development are discussed in this section. Section six discusses the operation phase and includes discussion on the installation and maintenance phases of systems development. This phase is just as critical to the success of an e-commerce system as the investigation and development phases. However, it is often neglected. This section discusses e-commerce marketing and e-commerce value-added services, such as customer service, online and offline operations.

4. INVESTIGATION PHASE

Within the investigation phase of e-commerce systems development two very distinct phases have been identified. The first phase is the strategic information systems planning phase. As with any strategic business effort market research needs to be conducted in order to identify if the planned strategic move will provide any benefit to the business. Possible benefits include lowering of costs, increased productivity and increased market share. The second phase is the requirements determination phase, which is the gathering of information regarding the requirements of the system.

STRATEGIC INFORMATION SYSTEM PLANNING

Successful e-commerce systems, just like other successful information systems, need to be implemented as part of a business strategy. Porter (1980) proposed 'conceptual typologies and empirical taxonomies of strategy, focusing on variables that have been show repeatedly to influence performance and that can be manipulated by managers'. These include cost leadership, differentiation and focus (Lederer, Mirchandani et al., 1996). However, many businesses are not implementing e-commerce systems as part of their business strategy as evidenced by comments made by several e-commerce systems developers interviewed in this research study (Dutton, 2000). Businesses are not identifying the benefits that they anticipate through the implementation of an e-commerce system. In determining if an e-commerce system should be implemented Lovatt (1997) states that first a business must establish the purpose and direction of the system— what the primary objective of the system is, why resources are being committed to the project, what the business expects to achieve from the development of the system and what the business expects from the system in the future. If the reasons for the e-commerce system follow the overall strategy of the business, then the business should conduct market research to determine how many existing or potential customers are likely to be Internet users (Watson and Zinkhan, 2000).

However, many businesses are making a token effort and establishing an e-commerce system just to have an Internet presence, not as part of an overall business strategy. 'Customer's just want an Internet presence and are not usually willing to spend the money to ensure that it is a success' (Dutton, 2000). Attempting to develop an e-commerce system without strategic support will not produce a quality result (Lovatt, 1997). This can have a negative impact on the business image as well as wasting valuable resources. Development of e-commerce strategies for businesses in the current environment given the rapidly changing nature of the World Wide Web (WWW) make strategic planning and forecasting very difficult. However, businesses need to determine at the outset what they hope to benefit from their e-commerce system in order to justify its development and determine if it is successful (Lederer, Mirchandani et al., 1996).

REQUIREMENTS GATHERING

Like the requirements-gathering phase of packaged software, the requirements-gathering phase of e-commerce systems are significantly different from traditional systems development. The e-commerce systems requirements gathering problem is a significant extrapolation of what packaged software developers went through in the 80s. Lynch (1987) states that in package software development the developer must be able to define a target market as well as specifications detailed enough to allow coding of an application that meets market requirements. The same is true for developers of e-commerce systems. However, with e-commerce systems often the developer is torn between client specifications and what the developer knows will be successful (Dutton, 2000). Not only does the e-commerce developer have to gather and define requirements for a potential audience of millions, but they must also satisfy their clients' requirements. With the lack of participation of users in the requirements phase, systems are often produced that do not meet the needs or satisfy the expectations of the users.

5. DEVELOPMENT PHASE

The design and development of a successful e-commerce web site is an ongoing project that does not have a fixed completion date. This is the significant difference between successful e-commerce systems development and failed e-commerce systems development.

Within the development phase exist the sub-phases of general design, detailed design, coding and testing. E-commerce systems development present challenges in each of these sub-phases. For example, general design is usually conducted by the developers without any input from users (consumers) and testing is usually limited to the use of hypothetical data. Within the bounds of the development phase there are also a number of identified critical issues that must be considered—usability, branding, privacy and security. These issues relate to the perceived quality of the system by users. Kitchenham, (1989) states that 'quality is hard to define, impossible to measure and easy to recognise.' This is no truer than for e-commerce systems.

E-commerce systems development needs to be conceptualized more as a combination of an information system development than as a software product development. Experience gained from developments in both disciplines may aid e-commerce developers in their offerings. Experience and knowledge gained from improved software development lifecycles and the process improvement that has been gained should provide developers with the tools required to produce systems that meet the clients' requirements. Developers of e-commerce systems need to incorporate the high-level quality attributes of ISO standards for product quality: functionality, reliability, efficiency, maintainability, portability and reusability (International Standards Organisation, 1991). The experience and knowledge gained from information systems development would provide developers with the tools to develop systems that meet or exceed users' expectations.

In addition to the factors that have been identified as effecting software quality, developers must consider a number of factors that are unique to e-commerce systems.

These factors are most influential when a user determines whether or not to trust an e-commerce system and the business behind it. These factors include usability, security and privacy which are not unique to e-commerce systems, but whose effect is multiplied by the medium of the Internet as it introduces issues that only exist on the Internet, and are therefore critical to systems success. Branding, or brand development is another factor critical to e-commerce success.

USABILITY

Usability of an e-commerce site is critical to its success. The Graphic, Visualization, and Usability (GVU) Center has conducted surveys every six months since 1994 on usability (Pitkow and Kehoe, 1996). These results repeatedly indicated that usability is a critical factor in consumers' perceptions of quality and therefore likelihood of use (Lederer, Maupin et al., 1998). Usability is a vague notion, hard to define and even harder to determine. What makes one system usable to one person may make it unusable to another. For example, a website written in English is usable to a person that can read English, but unusable to a person who cannot. Therefore, it is important to determine the audience of the e-commerce site to increase usability. Usability of an e-commerce system will be defined in terms of effective, efficient and satisfying performance of the user's task (Dzida, 1996). Usability when discussed in relation to e-commerce encompasses several factors. Factors able to be discussed by developers include: interface design; information access and performance (Nielsen, 1999); (Rohn, 1998); (Lohse and Spiller, 1998), each of which will be discussed in this paper. Other factors that affect usability and are beyond the developers control and, as such, will not be discussed in this paper are: experience; training and culture (Goodwin, 1987).

USER INTERFACE DESIGN

E-businesses have to deal with the limitations that a virtual environment places upon them. These include the physical limits of the interface. The web browser is one of the richest electronic interfaces developed. It allows for full spectrum colour images, video and stereophonic sound. However, it has serious physical limitations. One obvious problem with all electronic communication media is that an e-consumer cannot touch and feel a product over the web (Rose, Khoo et al., 1999). Intangibility is a problem with direct marketing of all kinds, electronic or otherwise (Reick, 1998). E-commerce also lacks a mechanism to transmit smell or taste. Both of these senses have been shown empirically to directly impact consumer buying behaviour (Johnson, Sommer et al., 1985); (Miller, 1991); (Wilkie, 1995). Therefore, e-commerce faces a number of hurdles if it is to become a widely accepted medium over which transactions are conducted.

From the beginning, hypermedia application design has been driven by technological innovation and constrained by technical feasibility. However, for the last few years, usability methods and results from human factor research have been gaining influence (Nielsen, 1993). Despite this trend hypermedia development has still very few documented development processes or methods (Lowe, Bucknell et al., 1999). It is commonly agreed that in order to increase usability there must be an increased emphasis on the use of standards in the development process. Standards such as ISO Standard 13407 – *Human-centered design process for interactive systems* and ISO Standard 9241-11 – *Ergonomic requirements for office work with visual display terminals (VDTs)* – Guidance on Usability go part of the way in ensuring that quality e-commerce systems are developed. Development of hypermedia standards, hypermedia design models and the use of ISO Standards such as 9126 – *Software Product Evaluation - Quality Characteristics for Their Use* will provide guidelines and tools for developers to design and develop quality hypermedia applications. However, even with guidelines and tools to aid developers, because the web is a cross-platform environment, it will continue to present new user interface challenges. Issues currently challenging developers are how to display systems on screen sizes ranging from 480x640 to 1600x1200, colour spectrums ranging from 1bit to 32bit colours as well as bandwidth ranging from 9,600bps to T3 connections. Wire-

less Application Protocol (WAP) will provide designers with user interface design issues well into the future.

INFORMATION ACCESS

The term information access deals with usability factors such as navigation, content and content presentation. Each of these factors has been identified as critical to e-commerce site success. Nielsen (1999) states that it is necessary to have a strong sense of structure and navigation support in a site so users know where they are, where they have been and where they can go. Rohn (1998) also identifies that clear navigation and a flat hierarchical structure are important. She reinforces the three-mouse-click navigation rule, the three-click navigation rule states that a user should be able to access all information within three mouse clicks. E-commerce systems navigation should be obvious with clear options to move between areas, such as product catalogues, the shopping cart, shipping information and the purchase area. Site navigation should be complimented by the use of a search mechanism that provides the user with options other than Boolean searches. Nielsen (1999) states that twenty years of hypertext research also suggests that the use of site maps is useful in giving users an overview of the navigation space.

Nielsen's (1999) statement that 'Content is king', indicates that content and its presentation is vital to systems success. Writing for the Internet is completely different to other traditional forms of writing and written expression. Users of the Internet wish to gain as much valuable information as quickly as possible without having to wade through pages of text or images. Nielsen (1999) states that it has been repeatedly found that users do not read online. Instead, they scan the text picking out highlights and hyperlinks and read only select paragraphs. It is therefore important to write content for the Internet in ways that are optimised for the way users access information online. Writing should be concise, easy to scan and objective (Morkes and Nielsen, 1998), with little to no animation as animation often hinders information processing (Nielsen, 1996). Rohn (1998) advises that e-commerce systems should not contain marketing hype as customers can be turned off by this. Instead straightforward information, giveaways and discounts should be used to entice customers. Dynamic content enables e-businesses to provide a unique experience for users each time they visit ensuring that customers do not get bored with the web site and that they also receive a constant stream of information increasing their likelihood of purchase.

PERFORMANCE

Nielsen (1999) maintains that download speed is the single-most important design criterion on the web. Shneiderman (1998) puts a value to its importance claiming that download delays cause frustration to users: waiting more than half a minute is considered intolerable. Rose (1999) identifies download delay as a major problem, second only to security. According to Van Slyke (1999), consumers' perceptions of trust are influenced by the technological competence of e-businesses. Therefore, poor performance will have a negative impact of consumers' perceptions of system usability. Developers must ensure that data files including text, images and other multimedia files are optimised for the web. The use of high performance technical equipment such as high end servers and large bandwidth also helps in increasing consumers' perceptions of system usability.

SECURITY AND PRIVACY

Trust

Hart maintains that trust is a fundamental principle that underpins every business relationship (1997). He suggests that trust has a changing and evolving dynamic—the introduction of technology challenges the current trust relationship causing it to be redefined or renegotiated. Ganesan (1994) builds on this notion of trust assigning it a causal function: trust is responsible for creating consumer activity. Security and privacy are two issues that are very often identified as having a negative impact on consumers' perceptions of trust in e-commerce systems, and therefore impact on the use by consumers of e-commerce systems.

Privacy

The lack of public confidence is a serious impediment to the up-take rate of B2C e-commerce. The concerns are not merely about security of value, but something much more significant: trust in the Information Society (Clarke, 1999a). Information privacy is 'the interest an individual has in controlling or at least significantly influencing the handling of data about themselves' (Clarke, 1999b). The public's lack of trust in the Internet as a business medium is clearly evidenced by the following surveys. A 1998 survey by privacy expert Alan Westin found that 81 percent of Internet users worry about the online invasion of privacy (Harris and Westin, 1998). A May 1999 survey by IBM also identified privacy on the Internet as an important issue. The results of the survey show that 72 percent of Internet users worried about Internet privacy. The study also found that only 21 percent of consumers trust Internet companies. Furthermore, 71 per cent agreed 'it is impossible to protect consumer privacy in the computer age,' with 80 percent agreeing that 'consumers have lost all control over how personal information is collected and used by companies' (IBM, 1999).

Developers must address privacy in a real and visible way. Through the use of privacy statements and disclaimers developers can provide consumers with information regarding information collect and use. The World Wide Web Consortium (W3C) is very much in favour of this form of privacy self-regulation. The Platform for Privacy Preference (P3P) is the W3C's software solution to privacy on the Internet. P3P is claimed to enable the user to manage their privacy. P3P is an Internet technology designed to develop greater levels of user trust in e-commerce web sites by presenting users with meaningful information and choices about website privacy practices (Cranor, Reagle et al., 1999). The 1997 GVU 7th WWW User survey cited in Hoffman, et al, (1998) found that 72 per cent of web users agree said they would give web sites their demographic information if the web sites would provide a statement regarding how the information collected was intended to be used. Clarke (1999a) however, advocates that Internet privacy protection demands a 'multitier approach involving individuals, organizations, industry associations and government, operating within a legislative framework'.

SECURITY

Most researchers such as Van Slyke (1999) agree that security and privacy are the main issues raised when considering that Internet as a means to conduct business. Security threats exist for both e-consumers and e-business in the form of stolen transaction information and misuse of personal information. However, these security issues are common to most businesses and are not exclusively associated with businesses conducting e-commerce. There

are two major security threats to e-commerce: transaction security and storage security. Security threats exist both with transactions between e-consumer and e-business, and with the storage of customer and transaction information by the e-business. Industry maintains that there is sufficient technology for secure B2C e-commerce transactions on the networks between server and client. Technological impediments exist in the security technologies that prevent hackers from attacking the client and server sites themselves (Rose, Khoo et al., 1999). Jeon (1997) notes that much anxiety over Internet security is either unfounded or not a result of actual technological flaws. Security concerns exist because not only do users not understand security technology but also the media perpetuates the uncertainty regarding security threats. Primarily, weaknesses in Internet security are a result of the failure to use existing security features of the Internet such as authentication (Elledge, 1997) and encryption (Radcliff, 1997)

Electronic transaction encryption technologies include Secure Socket Layer (SSL) and Secure Electronic Transaction (SET) that encrypt credit card numbers and other electronic data making them useless to unauthorized interceptors. Using these technologies, transactions across the Internet can be more secure than many manual traditional transaction processes, such as written transactions or transactions conducted over the telephone. However, the majority of consumers do not know about or understand security technologies such as SSL. Developers need to incorporate these technologies into their e-commerce systems as well as being seen to be incorporating them. Developers need to stipulate specifically to the users that they are using these technologies and provide an understandable description of what the security technologies involve.

Oliveira (1999) suggests that security has been and remains the number one issue for the future advancement of e-commerce. It is apparent that there is a parallel linear relationship between security and privacy and online proficiency. Negative perceptions regarding security and privacy increase as the level of online proficiency increases (Hoffman, Novak et al., 1998). The more experience a user acquires online the more comfortable they become with aspects of e-commerce, yet the greater their concerns over the security of personal information.

BRANDING

Companies spend millions of dollars every year on branding with the goal of associating a product or logo with a positive emotional experience, thereby creating customer demand and loyalty (Rohn, 1998). Unlike passive forms of advertising such as print or television advertising, web sites depend on their usability to create a positive experience. A negative experience at an e-commerce site, such as not being able to find a product or navigate through the site is associated with the company or brand (Spool, 1998). No amount of marketing can overcome a negative experience: a positive experience is essential in e-commerce sites. Branding also has a significant impact on the level of trust a consumer has in an e-commerce site and, consequently, their willingness to purchase. Transference is a phenomenon where consumer trust in an unknown target is influenced by trust in associated targets (Stewart, 1999). For example, an unknown merchant that displays their association with VISA™ and MASTER CARD is more likely to be trusted than a merchant that does not. There is a transference of trust between VISA™ and MASTER CARD™ and the unknown merchant. The same effect can occur between organisations as well as products and experiences.

Because of the jurisdictional and legal difficulties that the Internet imposes, governments have been forced to encourage self-regulation. Self-regulation on the Internet currently takes the form of Seal Agents. Seal Agents provide consumers with assurances up front that the policy of a web site accurately reflects their practices (Cranor, 1998). This assurance is an attempt to transfer trust between the seal agent and the organisation carrying the seal. Surveys cited in Cranor, et al (1999) have found that consumers are more likely to trust a site that is endorsed by a privacy seal such as TRUSTe or BBB Online. However, these same surveys also revealed that privacy seals are one of the least important criterions adopted by users for determining whether or not to provide information to web sites (Cranor, Reagle et al., 1999).

As information systems quality is determined by the users' perceptions of quality, it is of vital importance in the development phase of an e-commerce system to incorporate and consider the issues consumers perceive to be important, rather than by strict adherence to processes or standards.

6. OPERATIONS PHASE

The operations phase of e-commerce systems development is the phase where the developed e-commerce system is implemented and control returned to the business that contracted the development. Because many e-commerce systems are not developed as part of a strategic business decision, they are not well supported in their operation and, as such, the success that they achieve is often less than predicted or expected (Dutton, 2000). For e-commerce systems to achieve their predicted success each of the systems development phases need to be more closely aligned to users' expectations. The operations phase is just as critical as the investigation or the development phase. E-commerce systems need to be supported in order to produce the desired results. Factors that have been identified as critical in the operation of e-commerce systems include marketing, maintenance and value-added services such as customer service (Lohse and Spiller, 1998).

SYSTEMMARKETING

Marketing of any new strategic business effort is paramount to its success. For example, what is the use of a well investigated, well developed system that no one knows about and therefore no one uses? Marketing of an e-commerce system must be undertaken in order for it to be a success. Watson et al (2000) identify that a marketing strategy that applies to the Internet is vital for e-commerce systems success. When seeking information on the Internet consumers generally stop looking for the e-business they desire after a limited time. As such, they then may pursue alternative e-businesses. However, consumers have a limited search threshold. Frustration at failure to locate an e-business may cause the consumer to abort the search altogether after putting a relatively limited amount of effort into searching for each alternative (Capon and Burke, 1980). Therefore, marketing of e-commerce systems need to include both marketing on the Internet as well as in traditional media, at least until the Internet is a more widely accepted and used form of information and commercial exchange.

VALUE-ADDED SERVICES

The Internet as a medium for economic transaction has both advantages and disadvantages. Face-to-face purchases have been the norm for centuries, Ba (1999) correctly maintains that physical body language such as eye contact, a handshake and informal conversation help develop trust between business and consumers. It is this lack of human contact that makes service on the Internet less

real to consumers. However, Internet technology also allows business to personalise each consumers shopping experience. "Service is key to a truly successful e-commerce system" (Dutton, 2000). Von Hellens (1997) indicates that systems use quality depends on intangible service elements and is heavily influenced by the users' perceptions about the system and its benefits. The term value-added service describes services that add value to a consumers shopping experience. In face-to-face transactions it may be a friendly smile or that little extra service. In e-commerce systems it is the whole range of customer services, such as personalising the experience, contact information both online and offline, as well as providing details of shipping charges, times and dates and incentives to return. Value-added services should be used to increase the consumers' perceptions of their shopping experience. A positive experience will increase the likelihood of repeat business while a negative experience will almost guarantee that the consumer will not purchase again.

7. CONCLUSION / DISCUSSION

This paper has considered the development lifecycle used in the development of e-commerce systems. It has been identified that for the successful development of high quality e-commerce systems, developers need to recognise that e-commerce system development should not be conceptualised as software, rather as an information systems development. Greater emphasis needs to be placed on the abstracted phases of investigation and operation than is current practice. Current emphasis is primarily placed on the development phase. Businesses thinking of developing and implementing an e-commerce system need to identify their reasons behind the development as well as investigating if the system will bring benefit to the business. E-businesses need also to support their e-commerce systems, just as they would with any other strategic business effort. Developers and their clients need a change of attitude before consumers' levels of acceptance of e-commerce systems increase. This change of attitude will enable developers to develop systems of a higher quality that are widely accepted.

B2C e-commerce is developing in such a unique environment that it is difficult to predict which of the identified issues discussed will continue to maintain their importance or if some will fade in importance, only to be replaced by others (Rose, Khoo et al., 1999). Certainly, each of the identified issues provides a foundation for future B2C e-commerce development. Incorporation of these issues into the system development lifecycle is an area that academics, developers and managers alike, need to consider for future e-commerce developments and innovations.

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9. REFERENCES

- Ackerman, M. S., L. F. Cranor and J. Reagle (1999). Privacy in E-Commerce: Examining User Scenarios and Privacy Preferences. E-COMMERCE 99, Denver Colorado, ACM.
- Ba, S., A. B. Whinston and H. Zhang (1999). Building Trust In The Electronic Market Through An Economic Incentive Mechanism. ICIS, Charlotte North Carolina.
- Bolin, S. (1998). "E-Commerce: A Market Analysis and Prognostication." Standard View 6(3): 97 - 105.
- Borenstien, N. S. (1996). "Perils and Pitfalls of Practical Cyber Commerce." Communications of the ACM 39(6): 36 - 44.
- Boynton, A. G. (1994). Electronic Commerce 'Focusing on Success'. Chain Store Age Executive. January: 126.
- Capon, N. and M. Burke (1980). "Individual, Product Class, and Task-Related Factors in Consumer Information Processing." Journal of Consumer Research 7: 314-326.
- Cash, J. I., F. W. McFarlan, J. L. McKinney and L. M. Applegate (1992). Corporate Information Systems Management. Homewood IL, Richard D Irwin.
- Clarke, R. (1999a). "Internet Privacy Concerns Confirm the Case for Intervention." Communications of the ACM 42(2): 60 - 67.
- Clarke, R. (1999b). Introduction to Dataveillance and Information Privacy, and Definitions of Terms, 15/03/2000 2000, Internet, <http://www.anu.edu.au/people/Roger.Clarke/DV/Intro.html>
- Clemons, E. (1991). "Evaluation of Strategic Investment in Information Technology." Communications of the ACM 34(1): 22 - 36.
- Cranor, L. F. (1998). "Internet Privacy: A Public Concern." netWorker: The Craft of Network Computing 2(3): 13 - 18.
- Cranor, L. F., J. Reagle and M. S. Ackerman (1999). Beyond Concern: Understanding Net Users' Attitudes About Online Privacy, 15/03/2000 2000, Internet, <http://www.research.att.com/library/trs/TRs/99/99.4/>
- Dutton, P. (2000). Trust: Issues in the Design and Development of Electronic Commerce Systems an Australian Perspective. CIT. Brisbane, Griffith University.
- Dzida, W. (1996). "International Usability Standards." ACM Computing Surveys 28(1): 173 - 175.
- Elledge, D. (1997). "Keeping Out Prying Eyes." Information Week 629: 102-110.
- Ganesan, S. (1994). "Determinants of Long-Term Orientation In Buyer-Seller Relationships." Journal of Marketing 58(2): 1-19.
- Goodwin, N. C. (1987). "Functionality and Usability." Communications of the ACM 30(3): 229 - 233.
- Harris, L. and A. Westin (1998). E-commerce and privacy: What net users want. Hackensack, NJ, Privacy and American Business.
- Harrison, A. (1999). Fraud Doesn't Faze E-Customers, 20/5/1999 1999, Internet, <http://www.computerworld.com/home/news.nsf/all/9905204fraud>
- Hart, P. and C. Saunders (1997). "Power and Trust: Critical Factors in the Adoption and Use of Electronic Data Interchange." Organizational Science 8(1): 23-42.
- Hoffman, D. L., T. P. Novak and M. Peralta (1998). "Building Consumer Trust in Online Environments: The Case for Information Privacy." Communications of the ACM.
- IBM, G. S. (1999). IBM Multi-national consumer privacy survey, 15/03/2000 2000, Internet, http://www.ibm.com/services/files/privacy_survey_oct991.pdf
- IDC (1998). IDC Internet Market Commerce Model. The Industry Standard.
- International Standards Organisation (1988). Ergonomic requirements for office work with visual display terminals (VDTs) - Guidance on Usability ISO 9241-11, International Standards Organisation: 22.
- International Standards Organisation (1991). Software Product Evaluation - Quality Characteristics for Their Use ISO-9126,

International Standards Organisation.

International Standards Organisation (1999). Human-centered design process for interactive systems ISO-13407, International Standards Organisation: 26.

Ives, B. and G. Learmonth (1984). "The Information System as a Competitive Weapon." Communications of the ACM 27(12): 1193 - 1201.

Jeon, I. (1997). "The Information Dirt Road: Have you Smoothed Out the Bumps in Your Site?" LIMRA's Market Facts 16(4): 18-21.

Johnson, S., R. Sommer and V. Martino (1985). "Consumer Behaviour at Bulk Food Bins." Journal of Consumer Research 12(1): 114-117.

Kitchenham, B. and J. Walker (1989). "A Quantitative Approach to Monitoring Software Development." Software Engineering Journal.

Lederer, A. L., D. J. Maupin, M. P. Sena and Y. Zhuang (1998). The Role of Ease of Use, Usefulness and Attitude In the Prediction of World Wide Web Usage. CPR 98, Boston MA.

Lederer, A. L., D. A. Mirchandani and K. Sims (1996). Electronic Commerce: A Strategic Application? SIGCPR / SIGMIS, Denver, Colorado, ACM.

Lohse, G. L. and P. Spiller (1998). "Electronic Shopping." Communications of the ACM 41(7): 81 - 88.

Lovatt, M. (1997). Herding Cats: A Case Study on the Development of Internet & Intranet Strategies within an Engineering Organization. SIGCPR 97, San Francisco, CA.

Lowe, D. B., A. J. Bucknell and R. G. Webby (1999). Improving Hypermedia Development: A Reference Model-Based Process Assessment Method.

Hypertext 99, Darmstadt Germany, ACM.

Lynch, R. K. (1987). "The Impact of Packaged Software on User / Vendor Life Cycle Concepts." Journal of Information Systems Management Spring: 34 - 40.

Miller, C. (1991). "Research Reveals How Marketers Can Win by a Nose." Marketing News 25(3): 1-2.

Morkes, J. and J. Nielsen (1998). Applying Writing Guidelines to Web Pages, 23rd August 2000, Internet, www.useit.com

Nielsen, J. (1993). Usability Engineering. Boston, Academic Press.

Nielsen, J. (1996). Top Ten Mistakes in Web Design, 23rd August 2000, Internet, www.useit.com/alertbox/9605.html

Nielsen, J. (1999). "User Interface Directions for the Web." Communications of the ACM 42(1): 65 - 72.

Oliveira, L., P. Amorim and C. Vilao (1999). "Electronic

Commerce." International Financial Law Review: 37-42.

Pitkow, J. E. and C. M. Kehoe (1996). "Emerging Trends in the WWW User Population." Communication of the ACM 39(6): 106 - 108.

Porter, M. (1980). Competitive Strategy: Techniques for Analyzing Industries and Companies. New York, Free Press.

Radcliff, D. (1997). E-commerce Gets Set. Software Magazine. 17: 86-90.

Reick, D. (1998). "How to Trigger the "Yes" Response: Part Five: The Rule of Authority, 'Do it because I said So'." Direct Marketing 60(12): 48-51.

Rohn, J. A. (1998). "Creating Usable E-Commerce Sites." Standard View 6(3): 110 - 115.

Rose, G., H. Khoo and D. W. Struab (1999). "Current Technological Impediments to Business-To-Consumer Electronic Commerce." Communications of the Association of Information Systems 1(Article 16): 1-74.

Runge, D. and M. Earl (1988). Gaining Competitive Advantage from Telecommunications. Oxford, Oxford University Press.

Shneiderman, B. (1998). Designing the User Interface: Strategies for Effective Human-Computer Interaction. Massachusetts, Addison-Wesley.

Spool, J. (1998). Designing for Branding, 23rd August 2000, Internet, www.uie.com

Stewart, K. J. (1999). Transference as a Means of Building Trust in World Wide Web Sites. ICIS, Charlotte North Carolina.

Tilson, R., J. Dong, S. Martin and E. Kieke (1998). A Comparison of Two Current E-commerce Sites. Austin Texas, IBM Easy of Use. User Involvement Team: 87 - 92.

Van Slyke, C. (1999b). "Adopting Business to Consumer Electronic Commerce: The Impacts of Trust and Perceived Innovation Characteristics." .

Vidgen, R., A. T. Wood-Haper and R. Wood (1993). "A soft systems approach to information systems quality." Scandinavian Journal of Information Systems 5: 97 - 112.

Von Hellens, L. (1997). "Information Systems Quality Versus Software Quality

A Discussion from a Managerial, an Organisational and an Engineering Viewpoint." Information and Software Technology 39(12): 801-808.

Wang, H., M. K. O. Lee and C. Wang (1998). "Consumer Privacy Concerns about Internet Marketing." Communications of the ACM 41(3): 63 - 70.

Watson, R. T. and G. M. Zinkhan (2000). "Integrated Internet Marketing." Communications of the ACM 43(6): 97 - 102.

Wilkie, M. (1995). "Scent of a Market." American Demographics 17(8): 40-47.

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