Understanding web site redesigns in Small and Medium-sized Enterprises (SMEs): a UK based study on the applicability of e-commerce Stage Models

ABSTRACT

Despite the efforts of governments and the various support programs, achievement of advanced stages of e-commerce by Small and Medium-sized Enterprises (SMEs) is still very low. There have been some attempts to study the dynamic nature of web sites, but there is still little research evidence to explain why and how SMEs evolve their web presence. This paper aims to develop a comprehensive classification of drivers for web site redesign based on interviews with various members of staff from SMEs in the UK that had had recently redesigned their web sites. A sequential mixed-methodological analysis, involving the use of qualitative and quantitative data analysis, was used to develop the classification. This enabled the development of a framework that classified seven main categories of drivers for web site redesign. The drivers identified were: changing business requirements, evolving internet strategies, addressing user needs, maintenance, changing technology, pressure from peers/competitors, and the influence of developers. However, only the first four were found to be significant in the study. The categorisation developed and the findings suggest a number of key determinants not explicitly addressed by other work. In addition, the findings presented here provide little support for the staged approach to e-commerce progression as few companies reported the implementation of sophisticated internet technology features as a main reason for their web site redesigns. The contributions of this paper are firstly, to provide an instrument to the academic and practitioner communities interested in the topic of web site evolution. Secondly, the categorisation of drivers for redesign and the individual reasons found in this study are expected to provide assistance to SME managers to justify, plan and strategise internet investments realistically and effectively.

INTRODUCTION

This paper examines the dynamics of web site evolution in UK Small and Medium-sized Enterprises (SMEs) by investigating the drivers of web site redesign(s). The assumption is that exploring the drivers behind web site redesign in a diversity of SMEs should provide insights into their actual evolving strategies and use of e-commerce over time. In the late 1990s e-commerce was hailed as a revolution and the beginning of a new era that would transform the way business was conducted, with traditional marketing and selling approaches being replaced by new business models (e.g. Kalakota and Robinson, 1999; Currie, 2000). The internet was perceived as a panacea, able to produce large benefits, such as reaching new markets more effectively, enabling global businesses, and enhancing sales (e.g. KPMG Consulting, 1999). SMEs were particularly going to benefit and it was widely suggested that e-commerce would solve many of their inherent problems, such as their relatively small size and limited resources. The internet would enable them to 'level the playing field' when competing with larger firms (e.g. Levenburg, 2005; Drew, 2003; Teo and Pian, 2003; Daniel et al., 2002) by opening up much wider markets beyond their locality, by enabling them to look and feel like much larger enterprises, and by having 24/7 operations via the internet.

However, after the bursting of the dot.com bubble in 2000, with some high-profile failures, opinions changed and the literature began to reflect a more critical view of e-commerce (Fitzgerald et al., 2005). Other authors such as Porter (2001) and Carr (2003) maintained that the internet was not as radical as previously suggested and that it was little more than an additional business channel. Despite this re-evaluation many authors continued to recognise the strategic importance of e-commerce and its powerful influence on market and industry structures (e.g. Dans, 2004). It was not necessarily a panacea for all but success depended on the organisations business, background, environment, and objectives which meant that if e-commerce was applied appropriately and in suitable circumstances it could still be of substantial benefit, including for SMEs.

The use of the internet and e-commerce adoption by SMEs has typically been studied, and adoption encouraged, by the use of Stage Models (e.g. Poon and Swatman, 1999; Chaston et al., 2001; Daniel et al., 2002; Rao et al., 2003; Burgess et al., 2005). Stage Models imply a progressive development of the use of the internet and web sites from the most basic to the most advanced level of sophistication and integration, via a series of specific stages. Companies are expected to develop over time from the most basic forms of web presence, usually just the provision of information (or brochureware) and e-mail, through more sophisticated systems allowing ordering and payments on-line, through to the final stages representing complete business transformation. Such models, and the assumptions underlying them, have been highly influential, especially on government policies. The significant economic contributions of SMEs in virtually all the world economies (measured by business turnover and employment) are widely recognised. In the UK, for example, SMEs comprised the overwhelming majority of enterprises (99.9% with only 0.1% classified as large, i.e. more than 250 employees). SMEs also contributed significantly to UK employment (58.9%) and to business turnover (51.9%) (BERR, 2007). Given such economic importance governments have been very keen to stimulate and encourage SMEs. In the UK the Department of Trade and Industry (DTI) has sought to encourage SMEs in their e-commerce adoption and have used a Stage Model, known as the 'adoption ladder', to underpin their business support policy. In fact the UK has spent more than any other country (£67 million) on a comprehensive 3-year programme from 2001 to help get UK businesses online and increase the e-business readiness of SMEs (Pavic et al., 2007). The adoption ladder has been at the heart of the UK government's understanding of the adoption of information and communication technologies (ICTs) by SMEs with the implication that business benefits derive directly from the organisational change and increasing ICT sophistication that the Internet facilitates (Taylor and Murphy, 2004).

However, there are a growing number of authors who have questioned the appropriateness of Stage Models in this context (e.g. Martin and Matlay, 2001; Dixon et al., 2002; Levy and Powell, 2003; Fillis et al, 2004; Taylor and Murphy, 2004; Zheng et al, 2004; Beckinsale and Ram, 2006; Davis and Vladica,

2006). Stage Models are thought to be too generic, fail to reflect the diverse nature and needs of SMEs, and are not borne out by empirical evidence. Martin and Matlay (2001) think that the Stage Models based approach (or 'blanket' approach as they call it) is misdirected and likely to fail and indeed the UK government's target of one million SMEs trading online by the end of 2002 was missed by more than 50 percent, which was a decline over previous years. The UK government's other objective was to have SMEs progressing along its five stage adoption ladder, but these targets were also not achieved and adoption rates of the more complex stages were too low to be reliably measured (Brown and Lockett, 2004). Thus, despite the various support initiatives that have utilised Stage Models in the UK, its success as a model is questionable with the number of SMEs achieving advanced stages of e-commerce adoption being very low and lagging significantly behind larger companies (DTI, 2003; CBI and KPMG Consulting, 2002).

The aim of this paper is to establish an enhanced understanding of the dynamics of SMEs' web site evolution over time, by investigating the drivers of web site redesigns. Although recent literature focuses on more complex e-commerce issues (e.g. Internet business models, e-business and supply chain, e-business and business value, etc), there is still a need for further research into the more basic and primary use of the Internet and the external web site used to interact with stakeholders (Meroño-Cerdan and Soto-Acosta, 2007). If Stage Models were valid we would expect to find SMEs redesigning their web sites with the intention of implementing more advanced e-commerce features. Moreover, it would be reasonable to assume that the study of a sample of web sites with a wide range of lifespans (i.e. from one to eight years) would find many SMEs advancing, or intending to advance, to higher stages. However, if Stage Models were erroneous it might be expected that there would be a whole variety of drivers, typically not featuring advances from one stage to another. Thus, this exploratory research attempts to address three broad questions:

(a) What are the major drivers for web site redesign in SMEs?

(b) Do the drivers of web site redesign imply growth in functionalities and/or technical sophistication in the way that Stage Models suggest?

(c) Do different kinds of SMEs (e.g. different sector, size, etc) undertake redesign for different reasons?
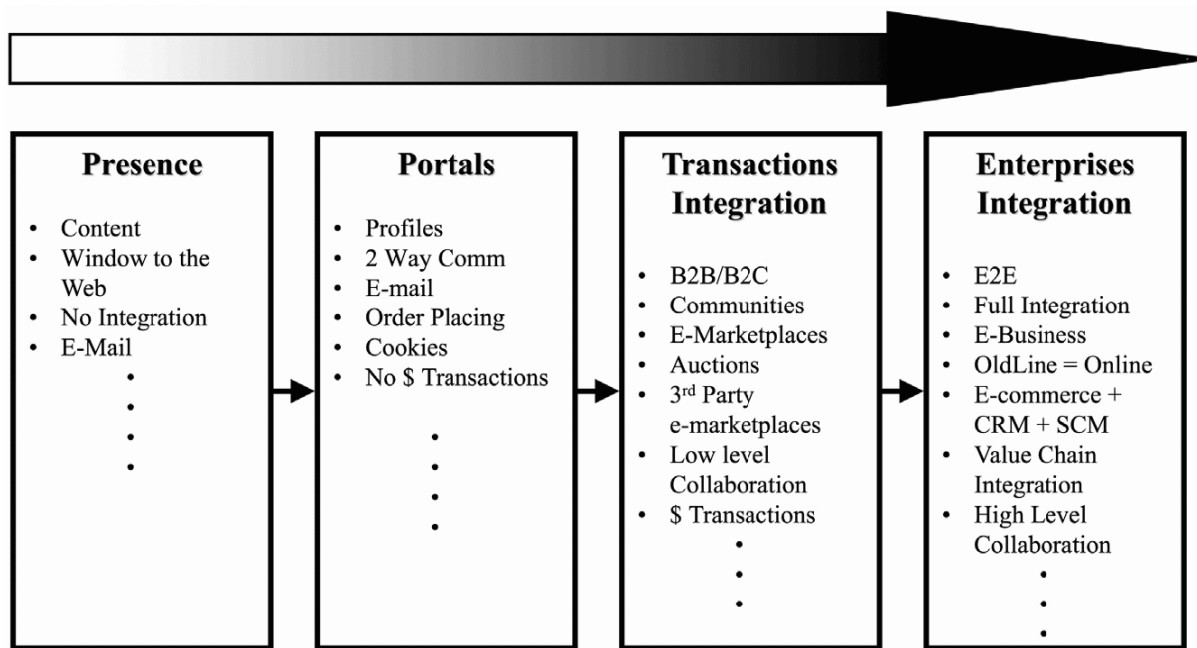
The structure of this paper is as follows: the next section discusses in more detail the concept of Stage Models and their limitations. This is followed by a discussion of web site evolution and change. Then the research methodology is introduced, followed by the results of interviews with various members of staff from SMEs that have recently redesigned their web sites. Then a new framework of categories of drivers for web site redesign is discussed, and compared with previous related work. The paper concludes with contributions and suggestions for further research.

E-COMMERCE STAGE MODELS

In the context of this paper a broad view of e-commerce is taken, i.e. that it is not just about buying and selling goods and services through the internet, but also about using internet technologies, such as email and web sites, for servicing customers, sharing business information, maintaining business relationships, and conducting business transactions, either within the organisation itself or with external stakeholders (e.g. the kind of definition adopted by Zwass, 1996; Poon and Swatman, 1999; Turban et al., 2002; Fillis et al., 2004).

A range of studies have suggested that SMEs incorporate particular web site characteristics over time in sequential stages of e-commerce sophistication (e.g. Poon and Swatman, 1999; Chaston et al., 2001; Daniel et al., 2002; Rao et al., 2003; Burgess et al., 2005). These models, known as Stage Models, suggest a development of web sites in successive iterations or redesigns, typically starting with a simple web site through to more sophisticated and complex e-commerce features, over time. Early stages are typified by a simple static informational or 'brochure' web site containing basic product and service information together with contact details, the next stages are characterised by a wider range of information related to marketing and interactive after-sales support. This is followed by e-retailing (buying and selling online),

where orders for goods and services can be placed and paid for by the customer, and even the progress of the order tracked on the web site. Finally, at the most mature stages, the business web site is fully integrated with the back office systems, such as, enterprise resource planning (ERP), customer relationship management (CRM), and integrated supply chain management (SCM) applications. It is assumed that the higher the stage that a business reaches the greater will be the benefits obtained. Figure 1 shows a typical example of a stage model for SMEs (Rao et al., 2003).

Presence	Portals	Transactions Integration	Enterprises Integration
• Content • Window to the Web • No Integration • E-Mail • • • •	• Profiles • 2 Way Comm • E-mail • Order Placing • Cookies • No $ Transactions • • • •	• B2B/B2C • Communities • E-Marketplaces • Auctions • 3rd Party e-marketplaces • Low level Collaboration • $ Transactions • • •	• E2E • Full Integration • E-Business • OldLine = Online • E-commerce + CRM + SCM • Value Chain Integration • High Level Collaboration • • •

Figure 1 - Stages of E-Commerce Development and their Characteristics (Rao et al., 2003, p.15)

In the area of information systems (IS) a stages theory first emerged in the mid 1970s with the work of Nolan (1973). His model provided a high-level view of IS strategy and implementation suggesting that the planning, organising, and controlling activities associated with managing the organisational computer resource changed in character over a period of time, and evolved in patterns roughly correlated to a number of stages. Each stage having its own distinctive applications, benefits and problems. Nolan's Stages Theory has become well known in the IS literature but also controversial, raising a series of

debates and arguments on the validity and viability of the concept (King and Kraemer 1984; Benbasat et al, 1984; Lyytinen, 1991).

Stage Models have been used extensively to illustrate and conceptualise change both in organisational research and IS research. They are premised on the idea that organisations follow a relatively stable and predictable pattern of development through a number of successive, identifiable stages (Van de Ven and Poole, 1995). Each stage is cumulative and reflects a particular level of maturity in terms of the use and management of IS to support and facilitate business activities, processes and operations. Achievement of the first stages of development allows the organisation to gain experience, which it can then use to its benefit to move on to the next stage of development, at which point it will gain further experience. In this way Stage Models offer insights into how IS and organisational strategies evolve over time and have become a popular element of IS planning approaches (Lyytinen, 1991).

Stage Models have become very influential in both academia and practice, including influencing governments and their policies (see above) and variations of these Stage Models are widely used as a way of examining the adoption and progression of a range of technological implementations in various domains. For example: Knowledge Management (Gottschalk, 2002), Intranets (Damsgaard and Scheepers, 2000), e-Marketplaces (Gengatharen et al., 2005), e-Government (Layne and Lee, 2001), ERP (Ash and Burn, 2003) and SCM systems (Folinas et al., 2004). However, some authors have regarded such Stage Models as inappropriate, incomplete and limited. For example, King and Kraemer (1984) found that they lacked empirical validation, while Mohr (1982) pointed out the lack of specification of the mechanism by which organisations moved from stage to stage, and their lack of detail concerning the sequences of events that occur within each stage. They have also been criticised for portraying only one possible sequence of events through which all organisations are expected to progress (Boudreau and Robey, 1999), and for ignoring the rapid rate of environmental and technological change (Sabherwal and Robey, 1995).

In the context of SMEs Stage Models have also been criticised (e.g. Dixon et al., 2002; Levy and Powell, 2003; Fillis et al., 2004; Taylor and Murphy, 2004; Zheng et al., 2004; Alonso-Mendo and Fitzgerald, 2005; Beckinsale and Ram, 2006; Davis and Vladica, 2006). The main criticism levelled is that they are over-prescriptive and do not reflect the actual behaviour of SMEs. They are thought to be too generic and fail to take into account the diverse nature and specific needs of SMEs. As mentioned in the Introduction the UK government's targets in this area have not been achieved, and indeed several studies have reported that SMEs, rather than progressing, as predicted by Stage Models, are actually regressing in their e-commerce stages (CBI and KPMG Consulting, 2002; DTI, 2003). Thus, despite the various support initiatives that have utilised Stage Models in the UK, its success as a model is questionable with the number of SMEs achieving advanced stages of e-commerce adoption being very low and lagging significantly behind larger companies (DTI, 2003; CBI and KPMG Consulting, 2002).

Research in Europe reveals that most SME e-commerce initiatives are still in their initial stages, and do not go much beyond the use of email and simple information-based web pages (McGregor and Vrazalic, 2005, Brown and Lockett 2004, Levy and Powell 2003). Thus, concerns have been raised and questions asked as to why government-led adoption programmes for SMEs are not more successful (Stockdale and Standing, 2004). This low engagement of SMEs could have severe consequences. Zheng et al. (2004) argue that SMEs are the backbone of sustainable, local economies and communities. Further, there is a move by the public sector to embrace e-procurement and if SMEs are not developing their e-commerce capabilities they are likely to lose out, with damaging effects on these communities. For example, in a supplier analysis pilot, involving fifteen London authorities, it was found that over 17% of local SME suppliers (that is at least 16,000 local jobs) were found to be potentially at risk due to moves to e-procurement (London Borough of Newham, 2005). Simpson and Docherty (2004) are also critical of business support mechanisms as delivered to SMEs based on Stage Models. They state that "the effectiveness of e-commerce advice and support for UK SMEs is poor and may be dangerous in that it may lead to increased numbers of business failure" (2004; p. 326). Thus, given the problems associated

with Stage Models this research attempts to obtain a better understanding of the evolution of SME web sites.

WEB SITE EVOLUTION AND CHANGE

The evolution and maintenance of web sites (whether they are SMEs or large organisations) is argued to be significantly different to the development of traditional software development (Ginige and Murugesan, 2001). Unlike most conventional software applications, which usually rely on a series of planned and chronologically spaced upgrades or releases, web sites undergo much more continuous, fine-grained evolution (Pressman, 2000). This open-ended development has been said to be analogous to a 'garden', which grows and evolve over the seasons and the years (Lang, 2001; Lowe, 1999) in an incremental fashion. They may well continue in this state for some time with only small incremental changes occurring. However, for most sites there comes a time when, for whatever reason, they transform and undergo a radical change or redesign. Such radical web site redesigns have been described by Ryan et al. (2006, p.657) as "sudden, major shifts in a web site between two points in time" that "involve more than mere alterations in appearance, such as changes in the number, nature, and organisation of pages that constitute a site". Such radical redesigns have also been described as 'discontinuous change', which is infrequent but intentional. Discontinuous change may occur in periods of divergence when external (e.g. technology change) or internal events (e.g. change in personnel) move the organisation away from its equilibrium condition (Weick and Quinn, 1999).

Albert et al. (2004) and Piccoli et al. (2004) suggest that the development of business web sites occurs mainly through these major redesigns, when new functionalities are introduced to address potential gaps between users' expectations and the delivered experience. The reason for such redesigns might be due to pressures to keep a web site 'fresh' and to encourage users to come back for something new, or to attract good search engine placements (Chikofsky, 1999). They might be motivated by a better understanding of user needs based on feedback and on new requirements, optimisation strategies, or new market directions

(Kirda et al., 2001). Machlis (1998) argues that there are occasions when major redesigns are unavoidable. For example, if the old site is not bringing in new business or no longer meeting its purpose, if it is not offering up-to-date information and not taking advantage of web technology advances or if it is necessary to address design/architecture shortcomings (Ramlet, 2001).

Thus, web sites appear to go through periods of relative stability with only minimal changes punctuated by instances of dramatic or radical changes. In order to understand web site development in SMEs it was decided to study these radical redesigns and the reasons behind them. Relatively few studies of redesigns have been undertaken and, as far as can be ascertained, none in the context of SMEs. Neither does there seem to be empirical studies of SMEs and their progression in relation to Stage Models. Of the studies concerned with drivers for web site redesigns, Ryan et al. (2006) examined changes in the context of university web sites and Benbunan-Fich and Altschuller (2005) in the context of large companies. The findings from these studies will later be compared to the authors' findings.

RESEARCH METHODOLOGY

As indicated the objective is to understand and explore the drivers of (reasons for) radical redesigns of SMEs web sites. A variety of data collection and analysis methods are potentially appropriate for such research but it was decided to adopt an interview based approach as it was felt that this would be the best way of obtaining a detailed understanding of the drivers and perceptions behind the redesigns, without imposing an artificial conceptual framework (such as an a-priori classification of drivers) on the subjects. According to Walsham (1995) interview is the method that the researcher can best access the interpretations that participants have regarding the actions and events under investigation. Interviewing as a source of evidence has the strengths of being targeted, as it focuses directly on the study topic, and being insightful, as it provides perceived causal inferences (Yin, 1994). As explained in the previous section, there have been some recent attempts to develop classifications of drivers for web site redesign. However, none of them has been widely employed and the disparity of these studies, in terms of purpose,

method, type of web sites focused on, etc., makes comparison very difficult. What is clear is that there is very little consensus on theory to inform the selection of categories and thus the researchers were reluctant to adopt a theory-driven approach that might force-fit the data obtained into pre-existing categories. Instead it was decided to utilise an inductive approach where the categories or themes emerge from the interview data itself and are not imposed prior to data collection. Miles and Huberman (1994) highlight several advantages of this kind of inductive and data-driven approach. Firstly, it shows that the researcher is more open-minded and more context-sensitive. Secondly, the data gets well 'moulded' to the categories that represent them and finally, the categories are better grounded empirically.

A sequential mixed-methodological data analysis, involving qualitative and quantitative analytic techniques, as described by Onwuegbuzie and Teddlie (2003), was adopted to analyse the interviews and develop a classification of drivers for web redesign. The rationale being that identifying patterns and allocating them to themes, categories, typologies, and the like based on the frequency with which a facet occurs (Miles and Huberman, 1994) is rigorous. Such processes of transforming qualitative data into numerical form, which can be represented statistically, has been found to be effective and to more fully interpret narrative descriptions (Sandelowski, 2001). Moreover, Huberman and Miles (1984) suggest that such a qualitative-quantitative linkage enables the identification of overall trends, new leads, and helps identify unexpected differences in a mass of answers. Although well used in a number of other domains this method of data analysis appears to be novel in the IS adoption literature.

Sampling and data collection

The sample strategy used in this study was criterion sampling, which requires all participants in the study to meet certain criteria and to have experienced the phenomena being studied (Creswell, 1998). The sampling frame was 221 UK web sites from SMEs monitored over an 18-month period. The sample was originally selected from a small business directory (www.small-business-finder.co.uk). Each of the businesses was checked to comply with the EU definition of an SME, i.e. less than 250 employees, a turnover below 50 million Euros and less than 25% owned by non-SMEs (EU Commission, 2003).

No other constraints were placed on the sample, such as industry sector or size (within the definition of an SME). Indeed it was preferred that a wide spread of business characteristics be achieved in order to ensure that the results obtained were sufficiently robust and had the widest applicability (Remenyi et al., 1998; Yin, 1994). This is in line with previous studies of e-commerce in SMEs, which often cover a wide range of industry sectors and sizes (e.g. Levenburg, 2005; Chaus, 2003; Drew, 2003; Levy and Powell, 2003; Rao et al., 2003 and Daniel et al., 2002).

In order to identify web site changes in the sample a comparison strategy was used. In October 2003, a copy of each of the web sites was made by downloading web pages using WebCopier v.3.5 (www.maximumsoft.com), an offline browser. This tool records entire web sites and stores them locally allowing them to be analysed and compared, even when they have been replaced or changed on the Internet. Another tool, Website-Watcher 3.50f (www.aignes.com), was used to identify and track changes on the sample web sites. This tool allows the automatic monitoring of web pages for updates and changes, such as new links and content. When changes in a web page are detected, Web site-Watcher saves the last two versions and highlights all changes in the page. Although Web site-Watcher can monitor complete web sites as well as single web pages, it was decided to focus on the homepages in the efforts to identify changes. According to Nielsen and Tahir (2002), the homepage is the most important page on any web site, providing the first impression and getting more page views than any other. Therefore, it is reasonable to assume that any substantial changes in the web sites would be reflected in the homepages. Web site-Watcher detects changed pages by checking their content, size and date (timestamp). It supports any kind of web page with textual content, independent of the file extension. That means that changes in both static pages (i.e.HTML) and dynamically generated or database-driven pages (e.g. ASP, PHP, etc) are detected and highlighted.

Those sites where change was detected were then downloaded again to check that they met the definition of a redesign, which in this study is a discontinuous change that involves the site's reconstitution in a new form but involve more than mere alterations in appearance, such as changes in its purpose, structure and

functionality. The criteria utilised for identifying a redesign was to meet at least three out of the four following conditions: 1) redevelopment of the web site appearance (e.g. layout and aesthetics), 2) different navigational mechanisms in the home page, 3) at least half of the hierarchical structure of the site being different (i.e. number and organisation of pages) and 4) change in the purpose of the web site. This resulted in the identification of 69 SMEs out of 221 who had radically redesigned their web sites in the period.

Following the recommendation of Dillman (2000) to help increase survey participation, a brief pre-notice letter was sent by both post and email to the 69 SMEs to notify them that in a few days they would be receiving a telephone call and that their participation would be greatly appreciated. Individuals were identified as the most appropriate person for this study given their authority and responsibility to make investment decisions for their organisation. Follow-up calls, were made to confirm that the companies had in-fact recently redesigned their web sites and to ascertain who had been responsible for the project and their willingness to participate in the research. Of these 69 SMEs, 41 (59%) agreed to participate in the interviews. A description of the sample is provided in Table 1. As can be seen, most of the responses were obtained from managing directors and owners of the companies. This is in accordance with SME literature that finds most owner/managers directly involved in all aspects of the decision-making processes relating to management and strategy. In just two cases the researchers were referred to web site managers external to the companies.

Table 1. Respondent characteristics

	Category	Frequency (N=41)	Percent (%)
Business type	Services	14	34%
	Computer/IT	13	32%
	Retail/wholesale	14	34%
			100%
Business size	Micro (1-10)	23	56%
	Small (11-50)	15	37%
	Medium (51-250)	3	7%
			100%
Web presence lifespan	Between 4 and 8 years	18	44%
	Longer than 8 years	13	32%

	Less than 4 years	10	24%
			100%
	Managing Director	18	44%
	Owner	9	22%
	General Manager	5	12%
	Business Development Manager	2	5%
Respondent position	Marketing Manager	2	5%
	Web site Manager	2	5%
	Account Manager	1	2%
	Chief Executive Officer	1	2%
	IT Manager	1	2%
			100%

Semi-structured interviews were conducted during the period of January to April 2005. The interviews were standardised, consisting of eight open-ended questions to obtain information about the reasons for the redesign, the purpose of the web presence, and other web maintenance and planning issues, such as the frequency of updates, prior redesigns, web presence lifespan, use of web analytics, and web development.

However, the researcher was able to digress from the questionnaire when other interesting issues arose or to ask for elaboration of incomplete or vague responses. In addition, the formulation of questions (including terminology) had to be adapted some times to fit the educational background and technical level of the respondents. The length of the interviews ranged from 20 to 45 minutes with an average time of 30 minutes, depending on the participant's time and willingness to answer in detail. Interviews were tape-recorded (all interviewees agreed to this) and in addition notes were taken during the course of the interviews.

Some informants indicated that they would prefer to respond to the questions via email and it was decided to accept data in this way, sometimes this was so they could think about their answers or that they were currently too busy. Consequently, a number of emails were exchanged with them in order to pose and answer the main questions of the study and any further explanations needed. This form of 'e-interview' has been reported to be useful as a complementary method when it is difficult to arrange a mutually convenient time to conduct an interview on the phone with busy research subjects (Bampton and Cowton,

2002). Additionally, this method provides the advantages of giving the interviewees time to reflect and construct a considered response. After analysing the results it was found that there were no significant differences between the telephone respondents and the email respondents. Therefore, the responses received from email were added to the telephone responses and for shorthand purposes all the responses are referred to as interviews in the rest of the paper whether it was via email or not.

Data analysis

The mixed-methodological analysis involved two phases. The first phase was qualitative and consisted of a content analysis to examine the responses of the informants regarding the reasons for their redesign. This is a qualitative method in which textual sources are systematically examined by identifying themes and coding, classifying and developing categories. This is a data-driven or bottom-up method for building up categories from textual data. The purpose of the analysis was to systematically derive categories of responses that were homogenous. The unit of analysis was the sentences or paragraphs that described single reasons for the redesign. Atlas/ti (www.atlasti.com), a tool for qualitative analysis, was used to code the transcripts of the 41 interviews describing the reasons and circumstances of the redesigns. This involved an iterative interpretation process of first reading responses, then re-reading to establish meaningful codes, and finally re-reading select responses to refine the number and meaning of codes in a manner deemed most representative of the respondents' text. Double coding (Miles and Huberman, 1994) was used for categorisation verification in the form of inter-coder reliability. Two of the researchers independently coded the respondents' descriptions and determined the emergent categories. The reasons and classification categories were compared and a rate of agreement of 95% was calculated using Holsti's (1969) coefficient of reliability. These small differences were discussed and resolved.

The second phase was quantitative and involved utilising descriptive statistics (i.e. SPSS) to analyse the hierarchical structure of the emergent drivers. In particular, each driver was quantified, or 'quantitized' in Tashakkori and Teddlie's terms (1998, p. 126). This is a process in which qualitative data are converted into numerical codes that can be statistically analysed. Specifically, for each participant in the sample, a

score of '1' was given for a category if it represented at least one of the reasons cited by that individual; otherwise, a score of '0' was given for that category. This procedure led to the formation of an inter-respondent matrix (i.e. Participant x Category). Such 'quantitizing' also allowed the frequency of each category to be calculated. From these frequencies, percentages were computed to determine the prevalence rates of each driver.

It is known that SMEs are not a homogeneous group and that their particular characteristics can directly affect their needs and opportunities to engage in various aspects of e-commerce (Taylor and Murphy, 2004). For example, different length of experience operating a web site may mean that the business have more time to reflect on the effect of the web site on their business (Davidson et al., 2006). Therefore, it was considered interesting to investigate whether the drivers that motivated their redesigns varied across different business characteristics such as business category, size and length of experience with their web sites (i.e. web site lifespan). This differentiation may be important because, as was discussed earlier, one of the main shortcomings of Stage Models is that they treat all SMEs in the same manner and are generally not targeted to any specific type of business.

RESULTS

First, a simple list of reasons given was constructed as mentioned in the interviews. Many interviewees gave more than one reason. A total of 23 identifiably different reasons were found and are listed in Table 2 together with an example quote from one of the interviewees which typifies that particular reason. As can be seen the most often quoted reason for redesign was in relation to refreshing the brand image with 19 mentions through to four reasons that were only mentioned once.

Table 2. Frequency of individual reasons	
Reason	**Freq.**
Refresh brand image (new look): "We just wanted a fresh and more professional looking web site really. The first one was done a little bit on a budget and we didn't think it look that good. So we just wanted to refresh it up, use different colours and making it look better really."	19
New services/products or capabilities: "The main reasons why we changed it was actually because the services that we offer changed. We changed the focus of our business, so the redesign we did was	9

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really to reflect the changes that we made inside the business."	
Increase customer confidence: "The most important aspect was to give potential customers confidence in the legitimacy of the business and therefore to buy from you. Additional areas such as the privacy policy page have been added to increase customer buying confidence."	8
Re-branding: "We have gone through a branding change and the redesign also came into it. We re-branded the company logo, corporate image, etc. The new web site reflects this trend."	7
Improve site management/maintenance: "There were a couple of reasons why I redesigned the site, the first one being the fact that the site was made of static HTML pages, which meant updating the prices was a nightmare. I cannot remember exactly how many pages there were, a couple of hundred perhaps. I have now changed to a database driven site using PHP/MYSQL and I can update the prices on the whole site in less than two minutes."	6
Improve navigation: "The purpose of investing in redesign is quite simply to improve navigation. The web site was too technical, too difficult to navigate. We put the strategic groups around our organisation into the forefront so that people can start there and then drill down. So if we are looking at the web site, we sell software, we offer a service package, we have hardware connections, we offer manufacturing solutions, that are my areas of work, so we want to bring them to the forefront of the web site."	6
Search engine optimisation (attract traffic): "One of the main aspects of the redesign of the web site was around having improved the optimisation of the web site so it was more easily identified by the search engines in order to appear higher in the rankings with the major search engines."	6
Improve usability and user-friendliness: "One of the main facets that we were looking for was a more customer-oriented and user-friendly site. We wanted the new web site to not only be visually attractive and functional, but also to offer intuitive and successful user experiences."	5
Add/Improve e-retailing functionality: "The redesigned web site allows a more sophisticated proposition for customers. For instance, bulk order discounts are automatically calculated. A user database allows corporate customers to open accounts with us and to view all their previous orders."	5
Improve accessibility: "The redesign was strongly based upon a need to move away from Flash. Although the majority of users have the Flash player, Flash sites do not perform for users with 56k modems (as they cannot cope). We do a lot of work for small companies of which many found us from home on a 56k modem connection."	4
Site architecture/design shortcomings: "Another reason was the fact that it was the first commercial web site I have ever made and there were a lot of layout errors, which at the time of constructing I didn't know how to correct. Also, the site needed restructuring as there were a lot of pages and images and they needed sorting in a more sensible way."	3
Audience/user needs and expectations: "The web site was originally designed for our customers to use to place their orders online with us. However, we found that most of our customers either use EDI or that they have software specially designed to print out stock re-orders at any given time in CSV format. It would have been pointless for them to re-enter this information onto our web site so the decision was made to drop the member's trade area and use the web site for mail order retail requirements. Having said that, all aspects of our web site are constantly changing and metamorphosing to fit in with consumer requirements, product changes, and design ideas."	3
Provide better (products/services) information: "We improved all the information on it for our customers. We got a lot more accurate description of our services and we added a portfolio of our work as well."	3
Improve advertising: "The main purpose of the redesign was to more effectively promote service offerings and provide more of an advertising resource. It seems that more often than not it is the internet that provides the first contact between a potential customer and us as a company. So improving the usability, content and completeness of our web site will help to advertise our company better than the previous site did."	3
Improve security: "Valuable contact information from our customer database was available to the public since the old web site did not allow restricting access to members only. We needed a secure, organised way for our staff and clients to easily share information."	2
Change of audience: "Initially our web site was more directed towards business-start ups and traders. We wanted the web site also to show the increase of our audience towards media and larger businesses.	2

So we wanted the web site to look like we also provide our services to bigger companies at this point."	
Increase conversion rates and visiting time: "At the end of the day what we tried to do is to create what we call stickiness, trying to get the visitors to stay longer in the web site and getting more involved in order to convert more of our site's casual visitors to buyers."	2
Internal company restructuring: "We underwent a fairly major company reorganisation to better server our customer base so we needed to reflect the transformation of the company in the web site."	2
New technological possibilities: "The business is run by myself from a home based office and is continually under development to take advantage of advancing technology."	2
Customer feedback/demand: "The need for a "Non-Frames" version was brought to our attention by a customer who could not access the site properly on his Mac computer. The frames page in the old web site used a JavaScript to give the main menu and this was causing him some problems."	1
Improve customer service/support: "We had a wish-list of features that would offer better quality customer service. For example, we spent a lot of time answering phone calls from our customers, often with the same support enquiries. We wanted to provide some way of answering many of these questions in the new web site and reducing the amount of time we devote to answering phone calls."	1
Fit with peers/competitors: "We used to rank quite well in Google and got quite a lot of visitors from it but Google changed its algorithm and we disappeared completely from the results. I looked at competitors sites who were still ranking good in Google to see what the differences were between their site and our site and most of them seem to have more pages and more information, generally, more text about the subject. So I redesigned the site to add more general information pages, about history and FAQs and so on".	1
Web developers influence: "The owner was impressed with the work of this designer on a web site he had visited. During talks on his own project, he was impressed by the honesty and grasp of wider issues (search engine marketing) that the designer showed. A whole set of improvements were listed by the designer regarding the implementation of new technologies (PHP, database-driven site)."	1
Total	**101**

The reasons listed in Table 2, although interesting, were too numerous to be useful as they stood, and so the researchers returned to the data to produce a set of higher level categories of reason, or drivers of redesign, as described in the Research Methodology Section. This was phase one of the mixed methodological analysis and a qualitative content analysis was undertaken in which the textual interview data was systematically examined and themes identified and coded, using Atlas/TI, to emerge significant categories. Table 3 shows the result of this analysis with the identified categories, or drivers of redesign, in the first column of the table, the associated individual reasons in column 2, and their frequency in column 3.

Table 3. Individual reasons and drivers		
Categories of drivers	**Individual reasons**	**Occurrence frequency**
Business requirements	Refresh brand image (new look)	19
	New services/products or capabilities	9
	Re-branding	7

	Company re-structuring	2
Internet strategy	Increase customer confidence	8
	Search engine optimisation (attract traffic)	6
	Add/Improve e-retailing functionality	5
	Provide better (products/services) information	3
	Improve advertising	3
	Increase conversion rates and visiting time	2
	Improve customer service/support	1
User-oriented	Improve navigation	6
	Improve usability and user-friendliness	5
	Improve accessibility	4
	Audience/user needs and expectations	3
	Change of audience	2
	Customer feedback/demand	1
Web site maintenance	Improve site management/maintenance (CMS)	6
	Site architecture/design shortcomings	3
	Improve security	2
Technology	New technological possibilities	2
Fit with peers/competitors	Fit with peers/competitors	1
Developers influence	Web developers influence	1
	Total	**101**

Table 4 shows the totals and percentages of the sample specifying reasons in these categories. Column 2 shows the absolute number of cases where a given driver was mentioned by an interviewee as being a key reason for the redesign, and column 3 provides the relative percentage (relating to the total number of cases analysed). The frequencies are different to those shown in Table 3 because, for this phase of analysis, only one answer per category, for each company, was allowed, i.e. if a company mentioned more than one reason in a particular category, e.g. Internet strategy, this was coded as just one occurrence.

Table 4. Analysis of the frequency of the main categories		
MAIN CATEGORIES OF DRIVERS	**TOTALS**	**Percentage (out of 41)**
Business requirements	31	76%
Internet strategy	18	44%
User-oriented	15	37%
Web site maintenance	8	20%
Technology	2	5%
Fit with peers/competition	1	2%
Developers influence	1	2%

In this analysis the most important drivers were Business requirements, Internet strategy, User-oriented, and Web site maintenance. In contrast, very few (only 1 or 2) of the redesigns were undertaken to take

advantage of new Technology, in response to developers' suggestions (Developers influence), or to achieve a Fit with peers/competition (note: most interviewees identified more than one driver thus column 2 does not total 41).

These drivers were further explored to investigate whether different kinds of SMEs tended to redesign their web sites because of different drivers and Table 5 shows the detail of the relative frequency of occurrence of each driver broken down into business categories. The percentages highlighted indicate which categories of businesses differ most from the sample as a whole in terms of the most relevant drivers for web site redesign. For example, it can be seen that Service businesses were more likely to have Internet Strategy drivers than were other businesses, and that Computing/IT businesses were more likely to have Business requirements drivers, and less likely to have Internet strategy drivers.

Table 5. Analysis of the frequency of drivers by business category								
Main categories of drivers	**Whole sample**		**Services**		**Computing/IT**		**Retail/Wholesale**	
	Totals	**% (out of 41)**	**Totals**	**% (out of 14)**	**Totals**	**% (out of 13)**	**Totals**	**% (out of 14)**
Business requirements	31	76%	9	64%	13	100%	9	64%
Internet strategy	18	44%	10	71%	1	8%	7	50%
User-oriented	15	37%	6	43%	4	31%	5	36%
Web site maintenance	8	20%	2	14%	2	15%	4	29%
Technology	2	5%	0	0%	0	0%	2	14%
Fit with peers/competition	1	2%	0	0%	0	0%	1	7%
Developers influence	1	2%	0	0%	0	0%	1	7%

Table 6 shows the detail of the relative frequency of occurrence of each driver broken down into business sizes. As can be seen the percentages for Medium sized businesses were most different. However, there were only three cases in this category and thus, these observations are not significant.

Table 6. Analysis of the frequency of drivers by business size								
Main categories of drivers	**Whole sample**		**Micro**		**Small**		**Medium**	
	Totals	**% (out of 41)**	**Totals**	**% (out of 23)**	**Totals**	**% (out of 15)**	**Totals**	**% (out of 3)**
Business requirements	31	76%	17	74%	11	73%	3	100%
Internet strategy	18	44%	12	52%	6	40%	0	0%
User-oriented	15	37%	10	43%	4	27%	1	33%
Web site maintenance	8	20%	6	26%	2	13%	0	0%
Technology	2	5%	2	9%	0	0%	0	0%
Fit with peers/competition	1	2%	1	4%	0	0%	0	0%
Developers influence	1	2%	1	4%	0	0%	0	0%

Table 7 shows the detail of the relative frequency of occurrence of each driver broken down into categories of web site lifespan. Although their frequencies are quite similar to the sample as a whole, it can be seen that the proportion of businesses citing Web site maintenance drivers seems to decrease the longer the web site lifespan.

Table 7. Analysis of the frequency of drivers by web site lifespan								
Main categories of drivers	**Whole sample**		**Short (1-3 years)**		**Middle (4-7 years)**		**Long (8-10 years)**	
	Totals	**% (out of 41)**	**Totals**	**% (out of 10)**	**Totals**	**% (out of 18)**	**Totals**	**% (out of 13)**
Business requirements	31	76%	7	70%	14	78%	10	77%
Internet strategy	18	44%	5	50%	9	50%	4	31%
User-oriented	15	37%	4	40%	8	44%	3	23%
Web site maintenance	8	20%	4	40%	3	17%	1	8%
Technology	2	5%	1	10%	1	6%	0	0%
Fit with peers/competition	1	2%	0	0%	1	6%	0	0%
Developers influence	1	2%	1	10%	0	0%	0	0%

DISCUSSION

This section describes the main categories of drivers developed in this study and discusses the results in the light of other research. Given that no research appears to have been devoted to understanding web site redesign drivers in the context of SMEs it was decided to compare the results of the present study with other redesign studies in different contexts. Specifically redesign categories identified by Benbunan-Fich and Altschuller (2005) in the context of large companies and Ryan et al. (2006) in the context of university web sites.

Business requirements drivers

It was not obvious in advance that the Business requirements category would dominate the others. The wisdom in IS research and practice is generally that justifications for systems development projects usually have to do with improving functionality and ease of use (Ryan et al., 2006). However, the results of this study suggest that the majority of companies in the sample evolved their web sites not to add e-retailing features or other advanced e-commerce facilities, as suggested by e-commerce Stage Models (e.g. Daniel et al., 2002; Rao et al., 2003). Rather, it seems that most of these companies were refining their web presence to reflect fundamental internal business changes, such as changing focus, combining/dissolving divisions, applying a new business model, going through a re-branding process (sometimes described as creating, or refreshing, a new image), acquiring new capabilities or otherwise altering products and services. This category also includes the notion of better reflecting how an organisation has changed or evolved over time. As Ryan et al. (2006) suggest it might be that organisations are in competition for the attention of web users and may believe that their users will cease to find their web sites interesting if they go unchanged for too long. Indeed, it appears that commercial web sites are perceived to influence potential customers' impressions of a firms' legitimacy, innovation and caring (Winter et al., 2003) and can make a company appear more reliable and trustworthy (McLean and Blackie, 2004). Thus, customers may obtain a negative impression from an old, or unchanging web site.

The analysis by business category also revealed that respondents who tended to cite Business requirements tended to belong to the Computing/IT business sector. This may indicate that this type of company, at least in the sample, was particularly dynamic, with constant challenges and business changes, characteristic of the evolving and fast-moving IT sector. The importance of the Business requirement driver in this study is interesting because it was not expressly identified in the Benbunan-Fich and Altschuller (2005) classification nor in the Ryan et al. (2006) study, although it might be argued that it could include the Marketing and Political drivers that they found to be second and third in their order of relevance.

Internet strategy drivers

Shifts in Internet strategy were found to be second in importance. In order to better accomplish the organisation's strategic objectives or even to reflect new ones, a firm might shift the focus of its online operations strategy to align with this (Ryan et al., 2006). Thus, the redesign of the web presence can be explained in terms of a modification in the organisation's purpose with the web site (Benbunan-Fich and Altschuller, 2005). For example, the organisation may decide to focus on the efficiency of internal processes, expanding or facilitating access to information content, supporting marketing promotions, incorporating online sales, providing better customer relations or support, etc. All of these changes may prompt a web site redesign in order to keep the firm's web presence in line with organisational strategic goals.

The analysis by business category indicates that informants who tended to cite Internet strategy were more likely to belong to the Service and not to the Computing/IT category. Especially relevant in this category was the desire to use the web site to increase customer confidence, and to attract new customers by improving the rankings in search engines. The improvement or addition of e-retailing functionality was only found in five of the cases. This was the category that Ryan et al. (2006) found as most relevant (termed 'rational change'). It was also included in Benbunan-Fich and Altschuller's study (2005) but there was no explicit indication of how relevant it was.

User-oriented drivers

The third driver in terms of importance was User-oriented (user-oriented issues), this is when the company aims to produce a better fit between the site and its audience (i.e. users or customers) by creating a better online experience and/or by responding to user feedback/demand. Sometimes redesigns are driven by an expanding user base or the fact that the current site no longer addresses appropriately the different and changing needs of users. This kind of redesign can take several forms. For example, taking into account user characteristics and preferences to improve overall usability of the site and make it better aligned with the way in which users wish to complete their goals. This might mean building more intuitive web site navigation and allowing users to get to the information they seek through different paths

(e.g. navigation menus, search boxes, etc) or by making the web site more user friendly, so that users can easily complete their tasks (e.g. order multiple products). In addition, over time, a web site may attract different user audiences and the information content offered through the web site may need to be developed or rearranged based on these audiences. In this way, web sites are modified to reflect a deeper understanding of user segments and their specific needs.

These drivers usually result in improvements to navigability, usability, ease of use and accessibility of the site. This kind of driver was not identified by Ryan et al. (2006) but it was included by Benbunan-Fich and Altschuller's (2005). In their content analysis of press releases concerning web site redesigns they found that the majority of companies redesigned their web presence to expand information, change navigation protocols, and improve the usability of their web sites, while very few added e-retailing features (e.g. online ordering). Piccoli et al. (2004) found a similar tendency for web sites to focus on information convenience, site navigation and customer confidence. The reported emphasis was on design, interface and usability issues to simplify customer's interactions with the web sites. Greater interactivity and personalisation to enhance customer loyalty were not the main issues found in the Piccoli et al. (2004) study. Instead, the trend was to provide exhaustive information, ease of use and efficient interfaces.

Web site maintenance drivers
Web site maintenance drivers were fourth in terms of importance. The evolution and uncontrolled growth of the content of a web site may lead to a number of maintenance problems (e.g. web site architecture erosion, outdated information, broken links, etc) that may well prompt a redesign of the web site in order to facilitate its management and maintenance. Frequently, this involves the implementation of a content management system (CMS) to make content maintenance easier. Such a system, allows the regular update of the content of a web site in-house, with no HTML or programming experience needed. In addition, a redesign of this kind also introduces more consistency through the use of templates, new or updated web publishing policies, procedures, and standards. Addressing other shortcomings of the web site design to

keep it running smoothly may also prompt a redesign of this nature. For example, providing enough server power to cope with increasing traffic and/or making the site download faster.

In our sample, these reasons were related mainly to improving the management and maintenance of the web site by implementing a CMS and improving the architecture of the web site. This category was not expressly identified as a category in the other studies. The analysis by category of web site lifespan also revealed that respondents who tended to cite web site maintenance were more likely to be found in the businesses with younger web sites (i.e. shorter lifespan). It seems that after a number of years of experience they are less likely to have issues with their maintenance, as might be expected.

The next three drivers were cited by only one or two interviewees and thus are only of minor significance and should be treated with appropriate caution. They are included here simply as indicating possible or potential drivers, for comprehensiveness, and are only briefly discussed. We could have ignored them or subsumed them into other categories but we chose not to do this so that they do not get lost. They thus have the potential to be included in future research studies to be substantiated or not.

Technology drivers

Technology drivers were cited by only two companies, however, although they were not mentioned by Ryan et al. (2006) they were identified by Benbunan-Fich and Altschuller (2005) as a category, with firms redesigning their web sites to take advantage of advances in internet-related technologies, such as evolving back-end databases, web presentation technology and formats (e.g. HTML extensions, Flash, and other audio/video media plug-ins), server side platforms, security services, etc. However, as most of the interviewees were managing directors or owners and very few (only three) were IT or web site managers it is possible that there is a bias towards the consideration of business requirements rather than technology issues.

Fit with peers/competitors drivers

This driver implies that businesses attempt to achieve a better fit between their web site and the web sites of other businesses to which they compare themselves. This driver is related with Institutional theory,

which rejects the organisational actors' rationality and claims that the structure and behaviour of an organisation is shaped by the characteristics of the environment in which it operates (Scott, 2001). Thus, businesses within a particular industry tend to look like each other over time, as competitive and customer pressures motivate them to copy each other's practices regardless of efficacy (DiMaggio and Powell, 1991). In this way, when peers and/or competitors incorporate particular functionalities or designs into their web sites then the business might decide to change in the same way. Thus, the business redesigns its web presence to achieve consistency and legitimacy and appear as expected, providing the same functionalities of its peer group. Despite there being only one citation for this driver in this study, Ryan et al. (2006) identify it as an important category and describe it as "keeping up with competitors". A possible explanation for the little relevance of this driver in this study could be that the respondents did not want to acknowledge that their decisions were not entirely rational but were just copying their competitors.

Developers influence drivers

This driver is the influence that internet consultants or web developers have on an organisation to redesign in some way. In the one case it was due to the skills of an outside developer and their suggestions for improvements. This driver was only cited once and it has not previously been identified in the other redesign studies so it might be concluded that this is not an important driver. However, other literature, for example, Frøkjær and Hornbæk (2004) have suggested that developers might have a special interest in minimising redesigns in order to meet time and cost-constraints and thus influence how problems on a web site are addressed.

Figure 2 summarises the discussion above in relation to web site redesign drivers compared to the other redesign classifications from the literature. It can be seen that there is some degree of overlap, as would be expected, given that all three studies are about web site redesign. However, it also shows that of the significant drivers, Web site maintenance is new, and Business requirements, very significant in this

study, overlaps only partly with Ryan et al. (2006) and not at all with Benbunan-Fich and Altschuller (2005).

Ryan et al., 2006 (Universities)	Present study (SMEs)	Benbunan-Fich and Altschuller, 2005 (Large companies)
	User-oriented	Accommodate the user
	Technology*	Technology available
Rational	Internet strategy	eMarketing strategy
Institutional	Fit with peers/competitors*	
Marketing	Business requirements	
Political		
	Website maintenance	
	Developers influence*	

* Possible driver

Figure 2 – Comparison of developed categorisation with the studies of Ryan et al. (2006) and Benbunan-Fich and Altschuller (2005)

These drivers are not mutually exclusive and often several of them work together to induce a web site redesign. Indeed, almost half the redesigns studied (20) corresponded to two or more drivers. Equally, a particular feature implemented in a web site may be seen as addressing more than one of these issues. For example, the implementation of an extranet or members-only area on a web site may have an Internet strategy aspect (i.e. trying to enhance the relationship with customers), a Business requirements aspect (i.e. providing new services to the registered users) and a User-oriented aspect (i.e. customising information content based on user type).

CONCLUSIONS

This study is based on interviews with various members of staff from SMEs that have recently undertaken web site redesigns. An analysis of the drivers behind the redesigns of a sample of 41 SMEs was undertaken and provided detailed reasons for their redesigns. Seven categories of drivers were identified: changing business requirements, evolving internet strategies, addressing user needs, maintenance,

changing technology, pressure from peers/competitors, and the influence of developers. However, only the first four were found to be significant in the study. The findings presented here provide little support for the staged approach to e-commerce progression as few SMEs reported the implementation of sophisticated e-commerce technology features as a main reason for their web site redesigns, nor did there seem to be a progression of redesigns as Stage Models would imply. Rather, combinations of Business requirements, Internet strategy, User-oriented considerations and Web site maintenance issues seem to be behind the redesigns. Thus, this research contributes to the debate on the applicability of Stage Models in IS and SME e-commerce in particular. Further, it would appear to support Martin and Matlay's (2001) view that government initiatives that take a holistic, rather than discriminant approach, and promote 'one size fits all' models of e-commerce, are likely to be misleading and will probably fail. We would argue that to be effective, models that are developed to assist with web site evolution and investment should be more specific to the individual needs and characteristics of SMEs.

The categorisation developed and the findings point to some key determinants not explicitly addressed by other work. This further justifies the selection of a 'data-driven' approach to the data analysis that allowed the researchers to be open to what the participants had to say, rather than force-fitting the data into predefined categories drawn from previous studies, which is common in much of the IS adoption literature. Furthermore, this is the first study undertaken on drivers for web site redesign in the context of SMEs. However, this novel approach could be applied to study investment decisions in other technology related areas.

Following the principles of Walsham (1993) and Klein and Myers (1999) for generalisation from interpretive research, this study can claim to offer generalisation to theory, as it has developed a comprehensive categorisation of drivers that can guide future studies in similar research areas. More specifically, the categorisation can be used by researchers as a guide in the examination of the evolution of other types of web sites, such as e-learning or e-Government, areas where Stage Models have also been applied.

In addition, the results present interesting implications for understanding the dynamics of web site transformations, especially in SMEs. This empirically based classification of drivers of change provides a means by which the changes made to SME web sites can be studied without the necessity of assuming a staged implementation. This will help researchers to undertake further case studies and subsequent non-quantitative analyses in a more insightful way. For example, this research is part of a wider longitudinal study investigating the evolution of the web presence of SMEs in the UK.

The findings of this study also have implications for managers and those who are involved in managing and maintaining web sites in organisations. Although it has been argued by some that web site redesign can dramatically increase sales it is clear that not all firms are obtaining such results (Winter et al., 2003). The categorisation of drivers for redesign, developed here, and the individual reasons found in this study are expected to provide assistance to SME managers to justify, plan and strategise internet investments realistically and effectively. This study points to specific situations when it may be necessary for an SME to undertake a redesign. Investments in internet technologies typically form a significant part of the limited resources and skills of SMEs and therefore, it is of particular importance that these investments are carefully planned to minimise the risks and ensure the desired benefits, and it is argued that the findings from this study will help them to achieve this.

REFERENCES

ALBERT TC, GOES PB and GUPTA A (2004) GIST: A Model for Design and Management of Content and Interactivity of Customer-Centric Web Sites. *MIS Quarterly* 28(2), 161-182.

ALONSO-MENDO F and FITZGERALD G (2005) Theoretical approaches to study SMEs eBusiness progression. *Journal of Computing and Information Technology* 13(2), 123-136.

ASH C and BURN J (2003) Assessing the Benefits from E-Business Transformation Through Effective Enterprise Management. *European Journal of Information Systems* 12(4), 297-308.

BAMPTON R and COWTON C (2002) The E-Interview. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research [On-line Journal]* 3(2). Available at: http://www.qualitative-research.net/fqs/fqs-eng.htm.

BECKINSALE M and RAM M (2006) Delivering ICT to ethnic minority businesses: an action-research approach. *Environment and Planning C: Government and Policy* 24, 847-867.

BENBASAT I, DEXTER AS, DRURY DH and GOLDSTEIN RC (1984) A Critique of Stage Hypothesis: Theory and Empirical Evidence. *Communications of the ACM* 27(5), 476-485.

BENBUNAN-FICH R and ALTSCHULLER S (2005) Web presence transformations in the 1990s: An analysis of press releases. *IEEE Transactions on Professional Communication* 48(2), 131-146.

BERR (Department for Business, Enterprise and Regulatory Reform) (2007) *Small and Medium-sized Enterprise (SME) Statistics for the UK 2006 Press Release, 22 August*. Available from http://stats.berr.gov.uk/ed/sme/smestats2006-ukspr.pdf. Accessed 30 September 2007.

BOUDREAU MC and ROBEY D (1999) Organisational Transition to Enterprise Resource Planning Systems: Theoretical Choices for Process Research. In *Proceedings of the 20th International Conference on Information Systems*, Charlotte, NC.

BROWN DH and LOCKETT N (2004) Potential of critical e-applications for engaging SMEs in e-business: a provider perspective. *European Journal of Information Systems* 13(1), 21-34.

BURGESS S, SELLITTO C. and WENN A. (2005). Maturity in the websites of Australian wineries: a study of varying website content. *International Journal of Electronic Business* 3(5), 473-490.

CARR M (2003) IT doesn't matter. *Harvard Business Review* 81(5), 41-49.

CBI and KPMG CONSULTING (2002) *Reality bites - The second annual report on e-business in the UK*. London, UK.

CHAU S (2003) The use of e-commerce amongst thirty-four Australian SMEs: an experiment or a strategic business tool? *Journal of Systems and Information Technology* 7(1), 49-66.

CHASTON I, BADGER B, MANGLES T and SADLER-SMITH E (2001) The internet and e-commerce: An opportunity to examine organisational learning in progress in small manufacturing firms? I*nternational Small Business Journal* 19(2), 13-30.

CHIKOFSKY EJ (1999) Aspects to consider for understanding web site evolution. In *Proceedings of the 1st International Workshop on Web Site Evolution (WSE)*, Atlanta, GA.

CRESWELL J (1998) *Qualitative Inquiry and Research Design; Choosing Among Five Traditions*. Sage Publications, Thousand Oaks, California.

CURRIE W (2000) *The global information society*, Wiley, Chichester.

DAMSGAARD J and SCHEEPERS R (2000) Managing the crises in intranet implementation: a stage model. *Information Systems Journal* 10(2), 131-150.

DANIEL E, WILSON H and MYERS A (2002) Adoption of E-Commerce by SMEs in the UK: Towards a stage model. *International Small Business Journal* 20(3), 253-270.

DANS E (2004) IT does matter. *European Business Forum (EBF)* 16.

DAVIDSON AP, BURGESS S and SELLITTO C (2006) An Investigation of SMTE Web Site Usage in Australia: Implications for E-Commerce Adoption and Planning Processes. In *Global Electronic Business Research: Opportunities and Directions*. AL-QIRIM NAY (Ed.), Idea Group Publishing, Hershey, PA, USA, 88-113.

DAVIS CH and VLADICA F (2006) The value of internet technologies and e-business solutions to microenterprises in Atlantic Canada. In *E-Commerce and V-Business: Digital Enterprise in the Twenty-First Century*, 2nd Edition. BARNES SJ (Ed.), Butterworth Heinemann, Oxford.

DILLMAN DA (2000) *Mail and internet surveys: The tailored design method*. John Wiley & Sons, New York.

DIMAGGIO PJ and POWELL WW (1991) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality. In *The New Institutionalism in Organisational Analysis*, POWELL WW and DIMAGGIO PJ (Eds.), University of Chicago Press, Chicago, 63-83.

DIXON T, THOMPSON B and MCALLISTER P (2002) The Value of ICT for SMEs in the UK: A Critical Review of Literature, *Report for the Small Business Service Research Programme*, The College of Estate Management, Reading.

DREW S (2003) Strategic Uses of Ecommerce by SMEs in The East of England. *European Management Journal* 21(1), 79-88.

DTI (DEPARTMENT OF TRADE AND INDUSTRY) (2003) *Business in the Information Age - International Benchmarking Study*. London, UK.

EU COMMISSION (2003) Commission Recommendation of 6 May 2003 concerning the definition of small and medium-sized enterprises. *Official Journal of the European Union* (L 124/36).

FILLIS I, JOHANSSON U and WAGNER B (2004) A qualitative investigation of smaller firm e-business development. *Journal of Small Business and Enterprise Development* 11(3), 349-361.

FITZGERALD G, PAPAZAFEIROPOULOU A, PIRIS L and SERRANO A (2005) Organizational Perceptions of e-Commerce: Re-assessing the Benefits. *Electronic Markets* 15(3), 225-234.

FOLINAS D, MANTHOU V, SIGALA M and VLACHOPOULOU M (2004) E-volution of a supply chain: cases and best practices. *Internet Research* 14(4), 274-283.

FRØKJÆR E and HORNBÆK K (2004) Usability Inspection by Metaphors of Human Thinking Compared to Heuristic Evaluation. *International Journal of Human-Computer Interaction* 17(3), 357-374.

GENGATHAREN D, STANDING C and BURN J (2005) Government-supported Community Portal Regional e-marketplaces for SMEs: Evidence to Support a Staged Approach. *Electronic Markets* 15(4), 405-417.

GINIGE A and MURUGESAN S (2001) Guest Editors' Introduction: Web Engineering - An Introduction. *IEEE Multimedia* 1(8), 14-18.

GOTTSCHALK, P (2002) Toward a model of growth stages for knowledge management technology in law firms. *Informing Science* 5(2), 79-93.

HOLSTI O (1969) *Content analysis for the social sciences and humanities*. Addison-Wesley Publishing Company, Don Mills.

HUBERMAN M and MILES MB (1984) *Innovation up close: How school improvement works*. Plenum Press, New York.

KALAKOTA R and ROBINSON M (1999) *E-Business: roadmap for success*. Addison-Wesley, Reading, Mass., Harlow.

KING JL and KRAEMER KL (1984) Evolution and organisational information systems: an assessment of Nolan's stage model. *Communications of the ACM* 27(5), 466-475.

KIRDA E, JAZAYERI M, KERER C and SCHRANZ M (2001) Experiences in Engineering Flexible Web Services. *IEEE Multimedia* 8(1), 58-65.

KLEIN H K and MYERS M D (1999) A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly* 23(1), 67-94.

KPMG Consulting (1999) *Electronic Commerce Research Report*. London, UK.

LANG M (2001) A Study of Practice in Hypermedia Systems Design. In *Proceedings of the 9th European Conference on Information Systems (ECIS)*, Bled, Slovenia.

LAYNE K and LEE J (2001) Developing fully functional E-government: A four stage model. *Government Information Quarterly* 18, 122–136.

LEVENBURG NM (2005) Does Size Matter? Small Firms' Use of E-Business Tools in the Supply Chain. *Electronic Markets* 15(2), 94-105.

LEVY M and POWELL P (2003) Exploring SME Internet Adoption: towards a contingent model. *Electronic Markets* 13(2), 173-181.

LONDON BOROUGH OF NEWHAM (2005) *London SMEs and Local Authority e-Procurement: Risk or Opportunity?* - Newham KickStart Project Director's report. London, UK. Available at http://www.imaginist.co.uk/documents/13SeptKickStartReport.pdf.

LOWE D (1999) Web Engineering or Web Gardening. *WebNet Journal* 1(1).

LYYTINEN K (1991) Penetration of information technology in organizations. *Scandinavian Journal of Information Systems* 3, 87-109.

MACHLIS S (1998) Site redesigns keep it simple … and don't do it too often. *Computerworld* 32(11), 43-44.

MARTIN LM and MATLAY H (2001) 'Blanket' approaches to promoting ICT in small firms: some lessons from the DTI ladder adoption model in the UK. *Internet Research: Electronic Networking Applications and Policy* 11(5), 399-410.

MACGREGOR RC and VRAZALIC L (2005) A basic model of electronic commerce adoption barriers. *Journal of Small Business and Enterprise Development* 12(4), 510-527.

MCLEAN R AND BLACKIE NM (2004) Customer and Company Voices in eCommerce: A Qualitative Analysis. *Qualitative Market Research: An International Journal* 7(4), 243-249.

MEROÑO-CERDAN AL and SOTO-ACOSTA P (2007) External Web content and its influence on organizational performance. *European Journal of Information Systems* 16(1), 66-80.

MILES M B and HUBERMAN AM (1994) *Qualitative Data Analysis,* Thousand Oaks, CA, Sage.

MOHR M (1982) *Explaining organisational behavior*. Jossey-Bass, San Francisco.

NIELSEN J and TAHIR M. (2002) *Homepage usability: 50 websites deconstructed*. New Riders, Indianapolis.

NOLAN RL (1973) Managing the computer resource: a stage hypothesis. *Communications of the ACM* 16(7), 399-405.

ONWUEGBUZIE A J and TEDDLIE C (2003) A framework for analyzing data in mixed methods research. In *Handbook of mixed methods in social and behavioral research* (TASHAKKORI A and TEDDLIE C, Eds), pp 351–383, Sage, Thousand Oaks, California.

PAVIC S, KOH SCL, SIMPSON M and PADMORE J (2007) Could e-business create a competitive advantage in UK SMEs? *Benchmarking: An International Journal* 14(3), 320-351.

PICCOLI G, BROHMAN MK, WATSON RT and PARASURAMAN A (2004) Net-Based Customer Service Systems: Evolution and Revolution in Web Site Functionalities. *Decisions Sciences* 35(3), 423-455.

POON S and SWATMAN PMC (1999) An exploratory study of small business internet commerce issues. *Information & Management* 35(1), 9-18.

PORTER ME (2001) Strategy and the internet. *Harvard Business Review* 79(3), 62-80.

PRESSMAN R S (2000) What a Tangled Web We Weave. *IEEE Software* 17(1), 18-21.

RAMLET S (2001) Know When It's Time to Overhaul. *Law Practice Management* 27(6).

RAO SS, METTS G and MORA MONGE CA (2003) Electronic commerce development in small and medium sized enterprises: a stage model and its implications. *Business Process Management* 9(1), 11-32.

REMENYI D, WILLIAMS B, MONEY A. and SWARTZ E. (1998) *Doing Research in Business and Management: An Introduction to Process and Method*. Sage, London.

RYAN T, FIELD RHG and OLFMAN L (2006) Discontinuous Change in University Web Sites: The Relative Importance of Reasons for Change. *Journal of Information, Information Technology, and Organizations* 1, 43-57.

SABHERWAL R and ROBEY D (1995) Reconciling variance and Process Strategies for Studying Information Systems Development. *Information Systems Research* 6(4), 303-327.

SANDELOWSKI M (2001) Real qualitative researchers do not count: The use of numbers in qualitative research. *Research in Nursing & Health* 24, 230-240.

SCOTT WR (2001) *Institutions and Organisations*. Sage Publications, Thousand Oaks, California.

SIMPSON M and DOCHERTY A (2004) E-commerce adoption support and advice for UK SMEs. *Journal of Small Business and Enterprise Development* 11(3), 315-328.

STOCKDALE R and STANDING C (2004) Benefits and barriers of electronic marketplace participation: an SME perspective. *Journal of Enterprise Information Management* 17(4), 301-311.

TASHAKKORI A and TEDDLIE C (1998) Mixed methodology: Combining qualitative and quantitative approaches. *Applied Social Research Methods Series* (Vol. 46). Sage, Thousand Oaks, California.

TAYLOR M and MURPHY A (2004) SMEs and e-business. *Journal of Small Business and Enterprise Development* 11(3), 280-289.

TEO TSH and PIAN Y (2003) A contingency perspective on internet adoption and competitive advantage. *European Journal of Information Systems* 12(2), 78-92.

TURBAN E, KING D, LEE J, WARKENTIN M and CHUNG HM (2002) *Electronic commerce: A Managerial Perspective*, Prentice Hall, New Jersey.

VAN DE VEN AH and POOLE MS (1995) Explaining development and change in organizations. *The Academy of Management Review* 20(3), 510-540.

WALSHAM G (1993) Interpreting information systems in organizations. John Wiley & sons, Chichester.

WALSHAM G (1995) Interpretive Case Studies in IS Research: Nature and Method. *European Journal of Information Systems* 4(2), 74-81.

WEICK K E and QUINN R E (1999) Organizational Change and Development. *Annual Review of Psychology* 50, 361-388.

WINTER SJ, SAUNDERS C and HART P (2003) Electronic window dressing: Impression management with Web sites. *European Journal of Information Systems* 12(4), 309-322.

YIN R (1994) *Case study research: Design and methods* (2nd ed.) Sage Publishing, Beverly Hills, CALIFORNIA.

ZHENG J, CALDWELL N, HARLAND C, POWELL P, WOERNDL M and XU S (2004) Small Firms and e-Business: Cautiousness, Contingency, and Cost-Benefit. *Journal of Purchasing and Supply Chain Management* 10, 27-39.

ZWASS V (1996) Electronic Commerce: Structures and Issues. *International Journal of Electronic Commerce* 1(1), 3-23.