



Developing a Framework for SME E-Commerce: A UK Perspective

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ABSTRACT

Whilst there has been work on e-commerce development, much of the work has been about large organisations and much has been USA-based. This research focuses on SMEs in the UK, and it considers how much of the existing published literature is applicable in this context. A prototyping approach is being developed to create a framework that will be based on benchmarks and that may be used by SMEs to assist in the creation of successful e-commerce web sites.

INTRODUCTION

SMEs are often perceived as having special needs because of their limited resources, especially in terms of personnel and finance. The introduction of e-commerce puts an extra strain on these resources. SMEs do have some advantages when considering new technology and new methods of conducting business, particularly that they tend to be more entrepreneurial, flexible, and innovative than large, more formally structured businesses.

There are several definitions of the term SME. In practice, schemes that are nominally targeted at small firms adopt a variety of working definitions depending on their particular objectives. In February 1996, the European Commission adopted a single definition of SMEs that would apply across Community programmes and proposals (Snaith and Walker, 2002). To qualify as an SME, both the employee and the independence criteria must be satisfied, and **either** the turnover or the balance sheet total criteria (see Table 1). The EC definition will be used for the purposes of this research.

The next section explains what is meant by the term 'e-commerce' in this context and why usability is an issue.

E-COMMERCE AND USABILITY

The UK Department of Trade and Industry (DTI) recommend their preferred definition of the term e-commerce for adoption within the UK to be as follows: 'Electronic commerce is the exchange of information across electronic networks at any stage in the supply chain, whether within an organisation, between businesses, between businesses and consumers, or between the public and private sectors, whether paid or unpaid'.

There are two main sub-divisions of e-commerce, business-to-business (B2B) and business-to-customer (B2C). Many SMEs move into B2C e-commerce without careful consideration of the implications this may have. The main driver seems to be fear that they will be 'left behind' if they are not seen to have the same web presence and facilities as their competitors. Whereas other projects undertaken in business will usually be preceded by favourable

feasibility studies, a significant number of companies have been found to enter into e-commerce regardless of projected returns on investment (Damanpour, 2001). Entry into the e-commerce arena may therefore be viewed as a strategic move by business owners – a calculated risk that they hope will one day pay off.

SMEs with a desire to implement e-commerce enabling customer interaction, i.e. B2C e-commerce, are shown to face more barriers than those who implement e-commerce for B2B solutions. B2C-oriented SMEs are therefore expected to grow at a smaller rate than their B2B peers (Woods, 2000). From these findings it can be deduced that SMEs considering – or in the early stages of – implementing e-commerce may require more practical assistance than B2B SMEs.

Usability refers to the extent to which a product is designed to fit users' needs, or the extent to which a product is easy to use (Rhodes, 2001). In software design it has been recognised that every \$1 spent on usability testing provides a payback of between \$10 and \$100 (Nielsen cited by Rhodes). These figures take on added significance when applied to web design; in other software developments the customer traditionally pays first and then experiences usability – whereas on the web users experience usability first and pay later.

There are many issues for consideration under the general heading of usability. At one level there are factors that affect the success rate of users in achieving particular tasks on a website; these may include page design, information design, multimedia content, navigation, and search capabilities.

When a website is implemented for the purpose of e-commerce, other issues arise. Trust, security and privacy may influence customers' decisions on whether or not to purchase online. Staff within the organisation of an SME may also have responsibilities for processes involving the e-commerce website. As end users, they may also need to be considered with regard to usability.

An e-commerce website cannot succeed without customers, therefore user-centred design ought to be the priority of e-commerce developers – in other words, website functionality should be determined by its impact on the user rather than what the developer may find easier to implement technologically. For example, a customer looking for a product on a site may choose to use a search box option. Products may be stored on more than one database according to type or function. The easier implementation option would be to provide a search box for each database – requiring the user to type the same search criterion more than once. User-centred design would consider this unnecessarily burdensome on the user; a single search box, while possibly requiring more engineering, would be the easier solution for the user (Vividence, 2000).

The following two sections of this paper provide an overview of the concerns mentioned above, while a third section discusses methods of evaluating the usability of an e-commerce website.

Design Factors

There is no way of knowing how individual customers will access websites – even assuming that most access will be via standard PCs, monitor sizes vary greatly as do modem bandwidths. There is also no guarantee that users have recent versions of browsers installed. These factors should ideally be taken into account when designing web pages. This may make life more difficult for

Table 1: EC Definition of SME

Criterion	Micro	Small	Medium
Max. no. of employees	9	49	249
Max. annual turnover	-	7m Euros	40m Euros
Max. annual balance sheet	-	5m Euros	27m Euros
Max. % owned by one, or jointly by several enterprise(s) not satisfying the same criteria	-	25%	25%

the designer, but the purpose of usability is to put the needs of the user first. It is estimated that 10% of users employ old software and low-spec hardware, and 10% of a potential customer base is a lot to risk losing (Nielsen, 2000).

Nielsen also suggests that fast initial loading of a page may minimise the risk of losing customers' attention. This can be achieved by ensuring that the top of the page contains less images and more text; providing text attributes for images so users know what they are waiting for to download and can make faster decisions based on that information; and by producing several smaller, less complex tables rather than one large table. Images should preferably be used only to represent concepts not easily presented in a text format.

Where media other than text are employed (e.g. video or sound files) it should not be assumed that all users have access to the necessary playback software. If a user is required to download plug-ins to view site content, they may decide to go elsewhere. Where these media formats are employed, it is a good idea to provide an alternative text-based explanation of what they offer, thereby enabling the user to make an informed decision on whether or not it is relevant to their needs. Another issue is playback times via low-bandwidth access. Providing an indication of file size/download time also facilitates usability (Nielsen, 2000).

Users are affected by delays in Internet responsiveness, and delayed documents containing text and graphics are viewed less favourably than delayed documents containing text only (Sears, Jacko and Borello 1997, cited by Lee 1999). Where graphics are required thumbnail images can be employed, whereby a small version of an image is downloaded with the web page and the user has the option to click on a picture to enlarge it for a clearer view. Text should never be presented as an image.

Users will usually have a specific goal in mind when they alight on a web page – they need to know that they can achieve that goal within a very short time of arriving. It is good practice to present all important information at or near the top of the page to prevent the need for scrolling, although recent studies show that users are more willing to scroll now than they were in the early years of the Web (Nielsen, 1996). Web users on the whole also tend to scan web pages rather than read them word for word (Nielsen, 1997). For this reason, it is important to present information clearly and concisely – e.g. highlighting keywords enabling users to quickly determine page relevance. Bulleted lists break up blocks of text and ensure that information can be scanned and comprehended relatively quickly.

Search engines use page titles to display results, therefore it is important to name each page clearly and appropriately. This enables users to make informed decisions on whether they wish to visit a site or not and may encourage more visitors to your site.

These users will not necessarily arrive on site via the home page; many will arrive on a page that is specific to their goals (via deep linking). These users must also be accounted for when making user-centred design decisions. Including the company name or logo on each page along with a clearly recognisable link direct to the home page enhances usability by passing control of navigation to the user. It is suggested that these users may in fact be the most important visitors an e-commerce website will receive, as they have a current, specific interest in the product they have searched for (Nielsen, 2002).

The user should always have the freedom to navigate a site at will. While the company may like to ensure that all visitors see specific pages of a site, this may be at odds with the user's goals. In order to navigate successfully, the user must always know where he is within the site. Breadcrumbs are increasingly being used as navigational aids (e.g. Home > Products > Perfume). Each breadcrumb may also be used as a link to another page. Links are arguably the most important feature of the World Wide Web; they enable the user to navigate within websites and to access a wide range of information from other sources if what they want is not in their current location. To best meet the users' needs, links should be descriptive without being over-wordy (Nielsen, 2000). Many browsers offer the option of a pop-up explanation of a link when the mouse is positioned over it; this again promotes usability by enabling the user to make a decision on a link's suitability to their needs before visiting it.

Although no navigation standard exists as such, there are conventions that have become established over time. The primary navigation bar tends to be placed across the top of the page, with secondary navigation categories listed down the left side. Many users will look for this familiar layout, so deviance from this format may counteract usability. Studies of e-commerce usability show that between 27% and 40% of users experience difficulty in finding the required page/information from within a website (Nielsen, 2002,

Vividence, 2000). Increasing user success on navigational tasks can increase their likelihood to return to a site by 25% (Vividence, 2000).

Trust, Security and Privacy

Trust is of major concern for e-commerce websites – it is a critical factor not only in attracting new customers, but also when it comes to maintaining the loyalty of existing customers (Lee, J., Kim, J., and Moon, J.Y., 2000). With regard to new customers, 70% of American users in 2000 were concerned that hackers may be able to access their credit card details, and 86% worried that their personal details may be passed to other people or companies once registered with one organisation (Fox, 2000). Improving usability can go some way toward overcoming these issues of pre-purchase trust, as people tend to trust web sites that are well-presented and more usable (Rhodes, 1998). Bricks and mortar stores have a human face to present to the customer that enables a relationship of trust to be established via a two-way interaction. On the Internet, the interface is the only medium presented to the user. The interface must deliver a sense of trustworthiness.

First impressions count, and good content with a simple design and few grammatical errors are factors that encourage the onset of trust from the user – findings that were confirmed by a survey of Internet users (Rhodes, 1998). The survey also concluded that users were more likely to trust sites that provided information with regard to when the content was last updated, sites that were easy to access, and sites that were easy to search. Users do not approve of promotional writing style with boastful claims (e.g. "best ever"): they prefer plain facts. Trust has been shown to suffer when the site exaggerates (Nielsen, 1997).

For established companies venturing into e-commerce, a prominent logo and/or slogan may assist the pre-purchase user to invest a level of trust in the website. This transference of trust can be extended by ensuring that the appearance of the website (e.g. colour schemes) matches up to that presented by the company in other media – sales literature, etc. A professional looking website can convey the impression that a company has invested considerably in the website and is therefore less likely to take opportunistic advantage of the user. Another factor of professionalism that may favourably influence the trust of the user is to have a domain name for the website that is consistent with the company name (Egger, 2001).

When trust has been established to the degree that the user feels comfortable enough to make an online purchase, the e-commerce website must maintain that trust in order to maintain customer loyalty. Feedback at all stages of the transaction provides reassurance to the user and improves the usability of any interface. An effective after sales service which makes it easy for users to return products and obtain refunds if necessary helps to build the environment of trust further.

Security of transaction was cited as a concern of 70% of American users in 2000 (above). To overcome this concern, clear information must be provided within the website on measures that are taken to ensure the integrity of data transfers. External links to organisations who provide hardware or software enabling secure transactions are another element of trust-building. Prominent links to security policies that address issues of liability in case of fraud and redress mechanisms can be used to complement textual reassurances that the page currently displayed is a secure page (Egger, 2001).

Not all users may differentiate between security and privacy. Providing links between security policies and privacy policies, or presenting them on the same page, may prevent some users from leaving a site when they are unable to find answers to their concerns (Snyder, 2001).

86% of American users questioned (above) were worried that their personal details may be passed to other people or companies once registered with one organisation. Privacy policies that state how personal information will be stored and utilised establish an environment of trust for the user. Good usability would also require that all personal information asked for is justified, can be easily amended and modified, and is requested at a relevant point in the transaction (Egger, 2001).

A usable website is more likely to inspire trust than one with poor usability, as ease-of-use may be interpreted by the user that a company understands its customers and cares for their needs (Egger, 2001).

Methods of Evaluating Usability

Methodologies for evaluating usability can either incorporate actual users or be carried out by the website developer/usability personnel. Each meth-

odology has its own costs dependent on resources needed, and may be implemented at various stages of the development cycle.

Methodologies include the following.

- Task analysis – evaluates how people actually accomplish things with software. Interviews and observations with users enable user goals to be established; tasks that support these goals are then determined and prioritised according to importance of goal and frequency of performance. Usability experts may then suggest ways to make the task more efficient from the perspective of the end-user.
- Cognitive walkthroughs – whereby users' goals are broken down to individual tasks to determine level of complexity. This methodology attempts to emulate the thought processes of a novice user to determine usability, and may be carried out on a prototype or working interface.
- Focus groups – enable an interface to be evaluated by more than one user at a time. Evaluating with more than one focus group provides a measure of integrity, with each focus group having a leader responsible for writing up comments and recommendations for improvement.
- Usability inspections – the review of a system based on a set of usability guidelines, carried out by usability experts. Issues such as consistency, navigation and error minimisation are analysed. When problems are discovered, the experts recommend solutions (usabilityfirst.com).

Testing with actual users identifies specific areas of poor usability within websites; the users chosen for testing should always be representative of the target audience. Evaluating usability need not be particularly costly; it has been shown that testing with five users provides the most reliable results (Nielsen and Landauer 1993). The first user observed will reveal a third of all usability problems with the design; the second user will repeat some of the first users actions and add some of his own. Each new user reveals less new data, therefore usability budgets are best spent on more tests with less users. More users may need to be tested when there are distinct user types for a system – e.g. e-commerce consumers and staff within an SME who have responsibility for processes involving the site.

CONCLUSIONS

SMEs are an important part of the UK economy and e-commerce is a growing area that cannot be ignored if SMEs want to be competitive. There are a number of barriers to successful B2C e-commerce, and these appear to remain unresolved. These barriers include design factors, trust, security, and privacy. This research involves the development of an approach for SMEs to develop e-commerce and these factors will be incorporated within the prototypes. The methodology outlined indicates that hands-on testing of sites will be combined with concepts and principles to establish a sensible framework that SMEs can use in e-commerce development.

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