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A survey of critical success factors in e-Banking: an organisational perspective

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Abstract
We investigate organisational factors critical to the success of e-Banking (EB). Scholars report that a variety of factors are vital to EB success. A shortcoming in the extant EB literature is that much of the research focuses on a small subset of success factors and an overall ranking of factors is still missing. Our aim, therefore, is to synthesise and test the critical success factors (CSFs) identified in the existing literature, thus, substantiating or not the factors purported to be critical. To achieve our aim, we created a survey instrument from a synthesis of CSFs identified from existing EB and e-commerce literature. We draw upon the e-commerce body of knowledge to take in the widest set of CSFs that can affect EB. Data were collected from U.K.-based financial sector organisations that offer EB services. We found the most critical factors for success in EB are: quick responsive products/services, organisational flexibility, services expansion, systems integration and enhanced customer service. Our research shows that organisations need to manage their EB initiative at a strategic level and treat it as business critical rather than simply a technical or operational issue. They need to pay attention to internal integration, which includes channels, technology and business process integration, and improving the overall services to their customers.
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Introduction

The U.K. financial services sector has undergone significant changes over the past 30 years. Until the early 1970s, the sector was bound by restrictions imposed by government regulations (Devlin, 1995). As a consequence, organisations in the sector were severely limited in their capacity to compete both domestically and internationally. Each organisation relied on traditional branch-based networks to deliver financial services. Banks had little pressure for change, becoming bureaucratic monoliths, internally focused and customer unfriendly (Harden, 2002).

By the mid-1980s, most regulations were swept away. Concurrently, the sector experienced the emergence of faster, cheaper and smaller technology. The confluence of deregulation and information technology created a highly competitive environment, and, with this, organisations in the sector faced mounting pressure for quick changes (Cronin, 1998). Customer service, efficiency and cost effectiveness became the sources of competitive advantage. Many banks either shed or closed their branch network. The search for new, lower cost channels of service delivery led banks to consider different ways of reaching customers. An early breakthrough was 24-h telephone banking – with FirstDirect. Then, the banks

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migrated these services to online versions to exploit the growth of personal computers and online access at home. However, early online financial services failed to get widespread acceptance and were discontinued (Cronin, 1998). In the last decade, the rapid expansion of the Internet provided banks with a channel to an increasingly technology savvy customer-base. The banks renewed their interest in electronic modes of delivery and, to this extent, have mirrored the rapid growth of other types of electronic services available over the Internet (Daniel, 1999). Banks offer most financial products such as current accounts, saving accounts, and different payment services via the Internet, which collectively we refer to as e-Banking (EB).

This paper makes a number of contributions to the literature. First, it gathers from previous literature all the factors that are critical to the implementation success of EB. Second, it provides empirical evidence of the perceived impact on success and shows that different critical success factors (CSFs) are perceived to exert a varying impact on success. In particular, factors related to the usability and service level offered by the Internet site to customers are found to represent fundamental success factors. Conversely, internal organisational factors are found to have limited perceived influence on success if considered alone; whereas, their relevance as success factors results when considered together with strategic factors. With respect to previous literature, this result is interesting in that we have addressed chief information officers (CIOs) and, based on previous contributions, expected a stronger orientation towards more technical and internal organisational drivers.

Testing is based on a comprehensive survey conducted to investigate the CSFs in EB. The survey targeted the financial sector in the U.K. A number (510) of medium (<500 but >100 employees) and large ($\geqslant 500$ employees) organisations were invited to participate. A good response rate of 22.4% was achieved. The aim was to understand and examine 'what' factors were critical to establish EB services. According to Oppenheim (1992), 'what' type questions are best addressed by conducting survey-based research. The statistical analyses performed for this phase of the research are similar to those applied by Han & Noh (1999–2000).

This paper is structured in four parts. The first reviews what we know from current research. The second describes the research framework. The third part sets out the statistical analysis and discussion. The final part summarises the results, discusses the implications of the research and identifies areas for further research.

CSFs in e-Banking

Rockart (1979, pp. 86–87) defines CSFs as 'the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation'. The CSF approach represents an accepted top-down methodology for corporate strategic planning that can highlight key information requirements of top management (Rockart, 1979). In addition, where CSFs are identified, the organisation's management team can take steps to manage these and, thereby, improve potential for success (Chen, 1999). This technique has been widely used in many businesses and technology-related contexts (see Rockart, 1979) and its use over three decades is still common (see, e.g., Sung, 2006). In the context of this research, CSFs theory is used to examine areas that are critical to the setting up an EB. Drawing on the extant literature, in the following we identify factors that are critical to Internet-based services that refer specifically to EB.

Researchers have studied the EB field from different perspectives and have used a variety of research methods. One group of researchers is engaged in quantifying the current provision of electronic services by the banks, from the perspectives of innovation and marketing (Daniel, 1999; Scruggs & Nam, 2002). Liao & Cheung (2002), Sathye (1999), Southard & Siau (2004) and Yan & Paradi (1998) explore the perception of customers about EB and the adoption of the Internet as a service delivery channel. Others, such as King & Liou (2004) and Harden (2002), compared EB with other channels. Strategic issues, such as outsourcing of EB initiatives, have been discussed by Cantoni & Rossignoli (2000) and Dewan & Seidmann (2001), or competitive advantage of EB (Griffiths & Finlay, 2004). In order to structure the research, we structure the literature into three broad categories of critical factors for EB services: strategic, operational and technical. These categories are used to direct attention, to provide a degree of focus for this research and to explain our findings in terms of the nature of success factors that contribute to establishing an EB channel.

Strategic factors

The interactive nature of EB creates opportunities to gain a deeper understanding of the customers. The data gathered about customers during their interaction with a bank can be analysed using data mining techniques. This marketing decision support capability may ultimately determine the success of a bank's Internet channel (Franco & Klein, 1999). Another study (Shah & Gupta, 2005) conducted at The Woolwich bank, in the U.K. found that understanding customers' needs was a top priority for EB managers and one of the key justification planks for the initial investment in the EB channel.

The provision of EB-based services often necessitates banks having to transform their internal operations. The new type of business would consist of a finely tuned and highly integrated combination of people, technology and processes (El Sawy *et al.*, 1999). Therefore, one critical issue is the re-engineering of a bank's business and technological processes.

The development of integrated, customised financial services is becoming an active area of competition between financial sector organisations (Enos, 2001). Consumers want to navigate to a single website rather

than move from one website to another to keep track of their finances. Web-based EB services have to be more convenient, easier to use, and less expensive than alternatives to win customer loyalty (Cronin, 1998). The real-time integration of distributed resources is one of the greatest potential advantages of EB for customers and banks. EB should be integrated with other channels such as ATMs and internal systems to increase its effectiveness. Transaction processing across the various electronic and traditional channels has to be real time in order to avoid customer inconvenience. A bank should be able to report to each customer what funds he or she has available at any given moment in time or else the bank might lose customers.

Mols (1998) suggests that banks use the Internet as an additional distribution channel while keeping their traditional channels intact, that is branches and phone banking. This gives banks the opportunity for a gradual transition from a branch banking strategy to an EB strategy. This seems to be the preferred route being adopted by many of the U.K.'s traditional high street banks (Harden, 2002). Cronin (1998) draws attention to the social aspects, which must be considered in the virtual environment. He proposes that the bank's brand is a resource that is transferable across physical and social barriers to entry when attracting customers to experience a new, and possibly daunting, virtual environment. This point is reinforced by Yousafzai *et al*. (2005). The importance of the traditional 'bricks and mortar' brand is increasingly recognised. Some banks, such as Alliance and Leicester, abandoned their Internet only banking arm (called Appia) with its new brand name and successfully used their existing brand name to attract customers to their EB channel.

Turban *et al*. (2000) identifies several CSFs for e-commerce initiatives, which can also apply to EB: only simple (Internet specific) products/services should be offered online, top management support, a project team reflecting various related functional areas, a user-friendly web-interface and appropriate promotion of the project both internally and externally.

Operational factors

A critical, and perhaps almost obvious, factor cited by many in the literature is good customer service (see, e.g., Liao & Cheung, 2002; Orr, 2004). This factor has been driven primarily by competition that has increased customer choice of products and providers and also by legislation that has increased customers' rights and technology that has made comparison of differing products and services easier and cheaper. The increasing amount of information on the Internet and changes in social behaviour has reduced the propensity of customers to remain loyal. According to Jayawardhena & Foley (2000), these changes will result in the growth of users with sophisticated needs and of new channels required to serve these needs. Harden (2002) argues that e-channels erode a direct relationship with customers and stresses the need for personalisation in customer communication.

Stamoulis (2000) argues that re-drawing the Internet market map is a vital prerequisite for EB strategies because the Internet requires different marketing methods than traditional distribution channels. He suggests banks identify a niche market and focus on exploiting it. Fruhling & Digman (2000) make a similar point. Their research shows that the Internet has significant effects on market development strategies.

The Internet is forcing banks to create new products and services and to make extant products more suitable for online delivery (Jayawardhena & Foley, 2000). A study of the Australian banking industry shows that there are several CSFs for Internet banking (Riggins, 1999). These include: developing the will to innovate rapidly, aggressively marketing the bank's website address to generate first time visitors, online decision support tools for personal financial management, the creation of an online 'virtual' community for financial services and bundling of products/services.

Technical factors

Technical and system security refers primarily to the protection of consumers' personal data, secure transactions to prevent misuse and stolen identities, and is paramount for the growth of online EB (Regan & Macaluso, 2000; Turban *et al*., 2000; Enos, 2001). Security, in this context, includes secure transactions as well as secure front-end and back-up systems.

Franco & Klein (1999) stress the importance of banks upgrading their existing back office technology infrastructure, which typically depends on slow and fragmented legacy systems. They advocate that organisations should match the performance levels of their back office systems to that of the Internet. The importance of robust and dependable technology is that failure leads directly to loss of customer confidence and revenues (Storey *et al*., 2000). Shortcomings in technological infrastructure are often the biggest hurdle in implementation of an EB channel and its integration with other channels (Shah & Gupta, 2005).

Research hypotheses

As seen in the previous sections, the literature provides a set of CSFs (summarised in Table 1) that forms the basis for further empirical investigation to determine which of these are critical to the success of EB practice. Furthermore, in order to identify the relevance and the business value of each category of factors, we now consider the contribution coming from the literature on the IT business value (Melville *et al*., 2004) research area. At the state of the art, IT business value is considered as generated by the exploitation of both IT and organisational resources and of the mediating effect of an IT organisational absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002; Malhotra *et al*., 2005) between IS integration and organisation competitive

Table 1 (a) A taxonomy of critical success factors in EB; (b) variable chosen for the research with the corresponding category of critical success factors in EB

Critical factor	*References*
(a)	
Strategic factors	
Business integration	El Sawy *et al*. (1999)
Re-engineering processes to web-enable them	El Sawy *et al*. (1999)
Cheaper than alternatives	Cronin (1998)
Integrating different channels	Franco & Klein (1999), King & Liou (2004)
Expanding existing markets	Stamoulis (2000)
Building trust on brand name	Cronin (1998), Yousafzai *et al*. (2003, 2005)
New products and services	Jayawardhena & Foley (2000)
Top management support	Turban *et al*. (2000)
Treating e-commerce as a business project (not just a technological project)	Fruhling & Digman (2000)
Project team reflecting various related functional areas	Turban *et al*. (2000)
Appropriate promotion of the project both internally and externally	Turban *et al*. (2000)
Operational factors	
Good customer service	Jayawardhena & Foley (2000), Orr (2004)
Simplifying and integrating basic services	Enos (2001)
More convenient than the competitors	Cronin (1998)
Easier to purchase than the competitors'	Cronin (1998)
Understanding customer purchase behaviour	Franco & Klein (1999)
Richness of website contents	Stamoulis (2000)
Technical factors	
Integration of technology	El Sawy *et al*. (1999)
Systems security	Enos (2001), Turban *et al*. (2000), Regan & Macaluso (2000)
Upgrading existing infrastructure	Franco & Klein (1999)
User-friendly web-interface	Turban *et al*. (2000)
Personalisation and customisation capabilities	Enos (2001)

Critical factor category	*Description of variable*
(b)	
Strategic factor	Support from top management
Strategic factor	Promotion of electronic e-commerce within organisation
Strategic factor	Fast and integrated business processes
Strategic factor	Expansion of current markets
Strategic factor	Increasing revenues
Strategic factor	Availability of resources
Strategic factor	Flexible workforce
Strategic factor	Flexible organisational structure
Strategic factor	Web-specific marketing
Operational factor	Fast responsive customer service (better than usual)
Operational factor	All time availability of services
Operational factor	Rapid delivery of services
Operational factor	Information about consumer purchasing behaviour
Operational factor	Information about customers
Operational factor	Incentives for customers
Operational factor	Multi-vendor solutions
Operational factor	Single vendor solutions
Technical factor	User-friendly website
Technical factor	Secure website and other related systems
Technical factor	IS integration
Technical factor	Personalising services

advantage. This contribution allow to consider the strategic factors as strictly related with organisational factors, having a high relevance on IT business value in general and, we argue, on success of EB services as provided through an IT infrastructure. Indeed, our hypothesis is that:

H1: *Strategic factors and the related organisational factors are most relevant for EB success than technical factors alone.*

Notwithstanding, on the basis of the literature analysis we assume that

H2: *Technical factors related to the usability and service level offered by the Internet site to customers are found to represent fundamental success factors.*

In order to verify our hypotheses, we first had considered a set of variables from the three broad categories given in Table 1a and 1b. The chosen variables and the related categories are described in Table 1b. In some cases we had specified some variable in order to obtain the same level of detail for all variables, for example 'Treating e-commerce as a business project (not just a technological project) is specified by ''Increasing revenues'''. Variables in Table 1b had been the basis for the experimental instrument used to verify our hypothesis. The following sections discuss the research method and the experimental instrument adopted.

Research methods

Data analysis proceeded along three stages, following identification of the CSFs in EB listed in Table 1b. In stage one, we developed a questionnaire (see next section). In the next stage, we conducted a survey using postal questionnaires. In stage three, we used statistical methods, descriptive statistics, factor analysis and *t*-tests, to analyse the data collected. This analysis was done using the SPSS/Win 9.0 statistical software package.

In our quest for a suitable existing questionnaire that might support our research, we searched the literature and posted an enquiry to the IS World members' email list. Failing to find any suitable instrument for our purposes, we developed a questionnaire. Each question asked about a single issue. We conducted pre-pilot and pilot studies to test the instrument. The main objective of 'validation tests' during these pilot studies was to ensure internal cohesiveness of the questionnaire. Consistency of attributes was achieved by dividing the instrument into different sections and special attention was paid to validity and linearity issues during the design and testing stages of the instrument development. Likert Scales (1–7) were used to measure the criticality of different attributes, with 1 being least critical and 7 representing maximum criticality. This scale is frequently used for measuring people's opinions (Han & Noh, 1999–2000 and Usoro, 1999), which is what this instrument set out to measure.

Once a workable experimental instrument was ready, we used a testing strategy based on the work of Han & Noh (1999–2000). Our instrument was tested on seven Ph.D. students within the Department of IS and Computing at a major U.K. University. The outcome of this test resulted in refinements to the questionnaire. In addition, we approached two independent EB consultants to further test the questionnaire. Our intention underpinning this step was to ensure the questionnaire was user-friendly from the perspective of practitioners. Their comments led us to make further modifications in style of questions used in the questionnaire instrument. Then, we conducted a pilot study. The questionnaire was posted to 15 organisations, one person per organisation, in the financial sector. Nine (60%) completed questionnaires were returned. This is a higher than expected response rate because some of the respondents were asked in advance to respond to the questionnaire. The respondents offered several suggestions such as merging some questions and other minor improvements, which were fully implemented. This version of the questionnaire instrument was further tested on a different set of researchers to assess its comprehension and the average completion time. They found the questions clear and the time for completion to be about 15 min, which was thought to be reasonable. Thus, the questionnaire was deemed ready for use to collect data (a copy of the questionnaire is provided in Appendix A).

The questionnaire was sent to 510 medium and large size organisations (more than 100 employees) from the financial industry listed in 'The Euromoney Bank Register (1999)'. It is important to note that this sample represents a purposive, non-probabilistic population, rather than a random one. Senior IT managers are generally considered to be the most likely people to be aware of issues related to EB from the technical perspective but also from strategic and operational perspectives, especially if the CIO is at a senior level in the overall organisational hierarchy (Johnston & Carrico, 1988; Somers & Nelson, 2001). For this reason, the questionnaire was targeted at senior IT managers. Recognising that the questionnaire may not always reach a senior IT manager or that the senior IT manager may simply not have appropriate knowledge, we requested recipients to pass the questionnaire to colleagues they considered to be most knowledgeable to answer the questions in the survey instrument. Organisations with fewer than 100 employees were classified as small and precluded from this survey. The organisational background of the respondents is summarised in Table 2.

Out of 510 questionnaires sent, a total of 114 were returned giving a 22.4% response rate. This level of response is common for similar surveys in the U.K. (see, for example, Fitzgerald (1997)). Out of 114 responses, 77 were usable (15%). Table 2 presents a breakdown of 'valid respondents' by type of organisation. 37 responses were

not usable. This unusually high number (32% of total responses) of unusable responses can be explained by Internet-based financial services organisations being new and many of the organisations surveyed are not yet offering such services.

Data analysis

This section presents statistical analyses based upon data collected from the survey. First, the factors were ranked using the mean scores (see Table 3) to determine the degree of consensus around the relative weighting of the factors. Second, a factor analysis was performed (see Tables 4 and 5) which shows likely relationships between different factors by clustering them into six different categories. Third, an independent sample *t*-test was performed to compare the data from different size organisations. Results show no significant organisation size-related differences with the exception of the 'systems and services integration' factor, which medium size organisations consider more critical than larger organisations. These types of analyses are in common with those conducted by Ang & Teo (1997) in a survey-based study to investigate the CSFs for sources of assistance and expertise in strategic IS planning.

Table 2 Respondents by the type of organisation

Organisation types	*Number*	*Percentage of total responses*
Bank	37	47.4
Building society	25	32.1
Investment bank	7	9.0
Private bank	2	2.6
Other	6	7.7
Total	77	

Descriptive statistics of CSFs in e-Banking

The analysis described in the previous section led to the descriptive statistics discussed below. The main aim of this analysis was to describe the importance of each factor in order of 'importance' ascribed to it by respondents. Results are presented in descending mean value (order of mean importance) in Table 3.

The relative ordering of adjacent factors in Table 3 is not significant but across the table as a whole there are indications of significant differences between the factors at the top and bottom of the table. This implies that factors at the top, such as user friendly website and security, are significantly more critical than the factors at the bottom of the table, such as web-specific marketing and vendor selection (confirming H2).

Factor analysis

Factor analysis was performed using principal component analysis (PCA) and Varimax with Kaiser Normalisation rotation method, until the Eigen value of each factor was greater than 1. The rotation converged in 14 iterations. PCAs are statistical techniques applied to a single set of variables where the researcher is interested in discovering which variables in a set form coherent subsets that are relatively independent of one another. Variables that are correlated with one another, but largely independent of

Table 3 Descriptive statistics for each variable in the order of importance

	Description of variable	*Mean*	*Std. deviation*
V13	User-friendly website	5.947	1.057
V14	Secure website and other related systems	5.869	1.258
V10	Support from top management	5.684	1.278
V16	Fast responsive customer service (better than usual)	5.602	1.200
V20	Promotion of electronic e-commerce within organisation	5.500	1.349
V11	All time availability of services	5.453	1.426
V6	Rapid delivery of services	5.450	1.406
V7	Fast and integrated business processes	5.419	1.506
V1	Information about consumer purchasing behaviour	5.397	1.581
V5	Expansion of current markets	5.311	1.432
V18	IS integration	5.293	1.440
V2	Increasing revenues	5.287	1.465
V8	Availability of resources	5.284	1.519
V15	Information about customers	5.260	1.337
V1	Incentives for customers	5.219	1.339
V19	Flexible workforce	5.145	1.734
V9	Personalising services	5.095	1.667
V3	Flexible organisational structure	5.082	1.598
V4	Web-specific marketing	5.080	1.412
V21	Multi-vendor solutions	4.932	1.879
V17	Single vendor solutions	4.260	1.953

V stands for variable that is followed by the number it was given in the questionnaire.

Table 4 Results of factor analysis (Rotated component matrix)

Variables	*Component*					
	1	*2*	*3*	*4*	*5*	*6*
V1	−0.159	0.194	0.183	**0.640**	−0.315	0.266
V2	**0.495**	−3.294E−02	−3.968E−02	0.454	−0.108	−4.115E−02
V3	0.231	**0.583**	0.196	0.314	−0.218	−0.147
V4	0.237	0.149	0.152	**0.732**	0.206	0.112
V5	**0.698**	0.293	0.260	−4.187E−02	1.126E−02	0.105
V6	0.191	0.289	−0.104	0.475	**0.450**	−0.331
V7	0.242	0.249	0.258	**0.397**	0.247	−0.274
V8	0.229	**0.505**	0.227	0.307	0.287	−0.182
V9	0.321	0.142	0.405	**0.409**	0.287	−7.357E−03
V10	**0.635**	0.144	−0.202	0.191	0.235	−1.712E−02
V11	**0.544**	0.236	0.371	0.259	−1.466E−02	2.835E−02
V12	0.156	8.601E−02	−3.324E−02	0.114	0.105	**0.848**
V13	**0.739**	7.029E−02	0.165	5.090E−02	9.751E−02	5.263E−02
V14	0.254	−8.519E−02	4.355E−03	6.098E−02	**0.781**	5.625E−02
V15	4.575E−02	5.166E−02	**0.592**	0.426	9.828E−02	2.358E−02
V16	−0.159	0.241	0.223	−2.285E−02	**0.702**	9.441E−02
V17	−6.047E−02	0.327	**0.758**	4.731E−03	−5.583E−02	9.093E−02
V18	0.316	3.668E−02	**0.755**	7.333E−02	0.159	−0.177
V19	0.144	**0.658**	0.263	8.799E−02	0.102	0.107
V20	0.394	**0.724**	−1.357E−02	5.595E−03	−4.554E−02	−0.109
V21	−9.284E−02	**0.731**	5.627E−02	0.120	0.211	0.247

Table 5 Cronbach's α for each critical factor in EB, in order of importance

Factors	*Number of variables*	*Cronbach's α score*	*Success factors and their variables*
1	5	0.78	*Fast and responsive products/services* Web-specific marketing Rapid delivery of services (quicker than usual) Fast responsive and integrated business processes Availability of human/financial resources Personalised products/services/advertisements
2	4	0.72	*Organisational flexibility* Changeable (flexible) organisational structure Selecting best of breed software products Promoting e-commerce culture within an organisation Flexible workforce ready to adapt to changes
3	5	0.69	*Expansion of services* Increasing revenues from electronic channels Expansion of current markets 24 × 365 days availability of service User-friendly and attractive website
4	3	0.65	*Systems and services integration* Gathering information about customers' online purchasing behaviour Selecting software systems from a single vendor Integration of IS
5	2	0.52	*Enhanced customer service* Secure website and other related systems Fast responsive customer service (better than usual)
6	2	0.20	Eliminated from analysis because of too low score

Table 6 Results of *t*-test comparing large and medium size organisations for CSFs in e-banking

Factors	*Size of organisation*	*Number*	*Mean value*	*Degrees of freedom*	*t-value*	*Significance (2-tail)*
Organisational flexibility	Large	22	5.0169	73	−0.713	N/S
	Medium	53	5.2381	28.123		
Quick responsive products/services	Large	22	5.1490	73	−0.628	N/S
	Medium	53	5.3257	44.126		
Expansion of services	Large	22	5.6878	73	−0.416	N/S
	Medium	53	5.5898	36.799		
Systems and services integration	Large	22	4.4508	73	−2.037	$P<0.05$
	Medium	53	5.1026	46.943		

other subsets of variables, are combined into factors. Factors are thought to reflect underlying processes that have created the correlations among variables. The exploratory nature of this study led to the selection of PCA to make the findings more meaningful.

Rotation is usually used after factor extraction to maximise the potential high correlations and minimise low correlations. There are many methods of rotation such as Quartimax and Direct Oblimin but Varimax is most commonly used (Tabachnick & Fidell, 1996). The goal of a Varimax rotation is to maximise the variance of factor loadings by making a high loading higher and low ones lower for each factor. The results of the factor analysis appear in Table 4, which shows that variables are grouped into six factors, with the highest score of each variable given in the bold typeface highlighting the membership of each variable within six factors.

The results of factor analysis are presented in Table 4. Factors were tested using reliability analyses to calculate their Cronbach's alpha, results of which are given in Table 5. The factors are derived from the combination of their variables. For example, the second factor (shown in bold) in Table 5 has four variables as its members, based upon by the factor analysis process, including: changeable organisational structures, selecting best of breed software products, promoting e-commerce culture in the organisation and a flexible workforce ready to adapt to changes. We interpreted this to indicate that these variables point towards the need for organisational flexibility. These interpretations were validated by showing them to three other distinguished academics and modified the language used, slightly according to their feedback.

Four of these factors had a score of more than 0.6 in the Cronbach's α reliability test (see Table 5), which is acceptable in similar theory building studies (Hair *et al.*, 2006). The fifth factor, 'customer service', was included although its Cronbach's α is 0.52 because prior research suggests that this is an important aspect of EB (Jayawardhena & Foley, 2000 and Orr, 2004). However, we suggest that, since the internal consistency of this factor is weak, care must be taken in interpreting its inclusion. The Cronbach's α value of factor 4 is not large enough to indicate whether or not this factor is reliable. The sixth factor was eliminated because of its very low Cronbach's α value of just 0.2.

Independent sample Student *t*-test

This test was conducted to analyse whether large organisations and medium size organisations differed in respect of their success factors. Respondent organisations were divided into two groups according to the number of employees: large organisations are those with more than or equal to 500 employees and medium size organisations are those with fewer than 500 but more that 100 employees. The study assumes that the two groups are different in respect of how they perceive different factors to be critical to them because of the differences in their size, financial resources and market penetration. An independent sample Student *t*-test was used to test this assumption and results are presented in Table 6. We noted that we were unable to verify reliably the size of two respondent organisations out of 77 usable responses. Therefore, those two were excluded from this the independent sample Student *t*-test.

Table 6 shows that large and medium size organisations did not differ in respect of three success factors. Only the first four factors in Table 6 were used in this test as factor 5 was not included because of its very low score in Reliability Analysis. The *t*-test results indicate that the 'systems integration' factor was the one on which the two groups significantly differed. Medium size organisations consider this factor to be more critical than larger organisations. This may be due to the limited resources medium size organisations have to invest in the integration of their back-end systems with their front-end systems.

Discussion of results

Four groups of variables emerged from the analysis presented above and the results are discussed below in order of their importance. Each of these groups of variables represent a strategic-level factor, involving one or more of the three CSFs categories discussed in Table 1.

Fast and responsive products/services ($\alpha=0.78$)

This strategic-level factor comprises variables (see factor 1 in Table 5) which involve web-specific marketing, rapid delivery of products/services, personalised marketing, fast responsive and integrated business processes. This factor includes having sufficient human/financial resources to accomplish the factors. Effective web-specific marketing

and personalising products to individual needs requires customer data to be gathered. These data need to be used to build longer-term customer relationships. Integrated business processes and systems create opportunities to track transactions by customer. Aggregating transactions across customers can yield historical information about consumer preferences, which each organisation can use to influence and cater to current preferences, combine preferences and create new expectations. The analysis of customer transaction history can highlight that market segments can be satisfied by new products and services (Kalakota & Frei, 1998).

As mentioned in the literature review section, customers' place high demands on e-channels and they expect services to be delivered significantly faster than conventional channels. To deliver services quickly, other factors such as integration of business processes as well as systems are also required. This suggests that although each of these factors is critical for success, managing one or a few of these well is insufficient to achieve true customer fulfilment. Instead, our results show that organisations need to take a holistic view of these factors.

Organisational flexibility ($\alpha = 0.72$)

The items constituting this factor (see factor 2 in Table 5) suggests the underpinning need for flexibility in different aspects of an organisation. The first element is structural flexibility, which refers to integrating different functions of an organisation around business processes, rather than traditional hierarchical structures. The intention is that structural changes be made according to changes in internal and external business environments (Kalakota & Robinson, 1999). This is a strategic-level factor because senior management have necessary control over resources and formal power to build structural flexibility in an organisation.

Having a policy of selecting best of breed products and an ability to integrate them, adds a further dimension to the organisation's ability to respond quickly. This enables it to choose the system's components according to its business requirements, rather than building the business around its system's capabilities. The proactive support for and promotion of e-commerce by senior managers within an organisation increases an organisation's ability to change itself quickly. El Sawy *et al*. argue that resistance to change can be lowered and cooperation between employees increased when senior !managers are committed to implementing change (El Sawy *et al*., 1999).

Expansion of services ($\alpha = 0.69$)

In e-commerce, expansion of services starts from development of an interactive and user-friendly website. The website along with associated functions or services has to be available 24 h every day of the year. Some financial sector organisations, such as the Alliance and Leicester bank (www.alliance-leicester.co.uk/services) are offering extra services such as car and house sales on their website, through their partner organisations. Not only does this result in extra revenue from new services, it often results in increased sales of existing products. For example, when a customer buys a car through the Alliance and Leicester website, their first choice for finance is the same bank. This ability to offer a wider range of products can be taken further by packaging together different products. This operational-level factor, combined with other factors discussed in this section, can increase an organisation's ability to expand in new markets and create new revenue streams.

Systems and services integration ($\alpha = 0.65$)

Integration is necessary to save processing costs, to develop the ability to gather/analyse customer related data for marketing purposes and to deliver integrated products in real time across channels. It involves the elimination of redundant systems and combining legacy and new systems so that they work like a single system. This level of integration requires substantial investment and technical capabilities. Businesses with limited technical or financial resources to ensure total integration can consider single vendor solutions because systems integration is usually easier this way and the vendor's support is available for this purpose.

Enhanced customer service ($\alpha = 0.52$)

This operational-level factor is mainly concerned with improving customer service to accommodate ever increasing expectations and to address customers' concerns about the security of their personal data and transactions. The often cited time-squeeze that customers face from long commutes, heavy workloads, family obligations, and household management problems pushes them towards integrated services that speed up their personal financial management. Customers are more likely to gravitate towards services that are integrated and secure, once they become aware of such services (Kalakota & Frei, 1998).

The factors discussed above appear to place strategic-level factors as more important than either operational or technical factors (summarised in Table 1). This demonstrates that EB is a strategic-level business issue rather than just an operational or technical issue, and the higher relevance of strategic factors as CSFs (confirming H1). EB requires changes in the way organisations conduct business and this can trigger major investments for EB to succeed. Both change and investment require an organisation's top management to be committed fully to this way of delivering services.

The results from the *t*-test also show that there are similarities, between medium and large size organisations, in terms of factors critical to EB success. These similarities could be due to the notion that success factors remain similar regardless of an organisation's size. Results of factor analysis support the findings of our literature review which suggest that EB is a strategic-level issue for both medium and large size organisations.

Summary and conclusions

EB is a key issue for many large and medium organisations in the financial services industry. This study addresses this issue by synthesising the current literature and exploring the factors that are critical to the success using a survey. The process and results of this study so far, are summarised in Figure 1.

In this paper, two major types of statistical analyses were conducted: descriptive statistical analyses and factor analysis. Based on the descriptive analysis, the factors (or variables) were ranked in order of their mean score, the highest score being the most important and so on. The top six factors in order of importance were: user-friendly website, 24-7 availability and rapid delivery of services, support from top management, fast responsive customer service, promotion of electronic commerce within organisation, and systems security (confirming H2).

Factor analysis enabled us to group together related variables to uncover 'factors' critical for the success in EB. Strategic-level issues related to organisational flexibility and speed of services delivery were found to be most important (indeed, results confirm H1). Flexibility refers to an organisation's ability to re-organise or re-invent itself in response to the external changes. From an EB perspective, this can include: re-structuring the organisation to speed up decision-making, re-engineering processes by web-enabling them, or simply making proactive changes to the website to attract greater numbers of potential customers or to increase its appeal with existing customers when transacting business. The factor, quick responsive products/services, is related to flexibility and speed in service delivery. This implies that an organisation should be able to deliver its products via electronic channels much faster than other channels and it should be able to make quicker changes in services, if necessary, in response to the changes in the market place. This finding is supported by research conducted by Owens & Robertson (2000).

Service expansion is related to marketing products to new customer segments as well as offering extra services to utilise EB capabilities. Business processes, systems integration and enhanced customer services were next in the list of importance. The findings of the survey are in line with theoretical predictions from general EB literature reviewed earlier in the paper. The contribution of this research is to bring together and validate empirically a diverse range of critical factors. The resulting list of CSFs is by no means exhaustive or final; although it does place the array of factors in the current literature to an empirical foundation. Managers will find this work useful when planning the strategic implementation of EB and channelling resources towards more critical aspects of EB management.

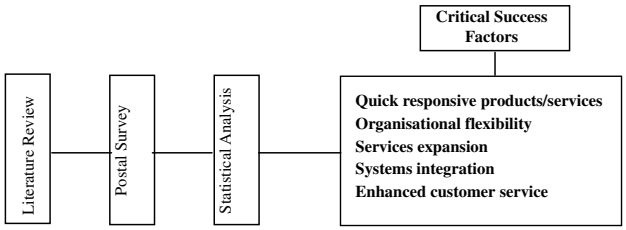

Figure 1 The process and results of postal survey research.

This paper makes a theoretical contribution in the form of its conceptual framework that is based on CSFs. We found CSF theory to be useful in demonstrating the presence of critical factors in the EB environment and their positive relationship with the success of such services. We argue that CSF theory, in general, and the CSFs found by this research, in particular, is applicable to retail EB.

We found that the research method, postal surveys, has a number of strengths. In the context of this research, one of the main strengths of the survey approach was the ability to collect information from a large sample of medium and large organisations in the U.K. financial services sector. The second strength is that it lends itself to future replication by other researchers because the questions and sampling were tightly controlled. However, we also note two limitations. One, a relatively low response rate weakens the reliability of the results presented. Two, the survey used senior IT managers as the sample group and would have benefited from involving IT directors and e-commerce directors to provide an even greater strategic perspective. Nonetheless, the study provides a base from which to repeat this survey in two years to assess the degree of change over time.

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Appendix A

Questionnaire used for the survey

A survey on organisational success factors of online financial services This survey explores the organisational critical success factors of online financial services. It is intended for organisations offering services online. It has three main objectives:

- To capture data/information about the extent to which financial sector organisations are offering their services online;
- To determine the organisational factors most critical to the success of online financial services and
- To identify the reasons which may lead to the failure of online financial services.

All the data/information you give will be treated in the **Strictest Confidence** (personal information e.g. respondent name or company details will not appear in any publicly available publication) and will only be used for research purposes. It will not be passed to any third party organisation or individual outside Brunel University.

To help us to classify your answers and to make our statistical analysis, please fill in the following table. (Leaving blank any field which you prefer not to be known to us)

Name of Company
Full Address
Your name
Your job title
Telephone Number
E-mail address
Web Address of the firm
Type of business (e.g. a bank)
Approx. number of employees
When did you start offering online services (year)?

Q 1. Do you offer financial services online? (see notes on Q1)
Yes [ ] **No** [ ]

Q 2. Which financial services do you offer **online** now, or are planned for the future? Please evaluate these services, (see notes on Q2). Please answer all questions.

	Successful	*Not successful*	*Not offered*	*Planned for future*
Information only	[ ]	[ ]	[ ]	[ ]
Retail financial services	[ ]	[ ]	[ ]	[ ]
Insurance	[ ]	[ ]	[ ]	[ ]
Mortgages	[ ]	[ ]	[ ]	[ ]
Business services	[ ]	[ ]	[ ]	[ ]
Brokerage	[ ]	[ ]	[ ]	[ ]
Others (please specify): ……	[ ]	[ ]	[ ]	[ ]

Note: If you have not offered any online services in the past or not offering any at present, please ignore the rest of the questions and return

Q 3. Which factors do you think are the most critical to the success of online services in your organisation? (See notes on Q3) Please answer all questions and put only one tick for each question.

	Criticality							
	[High]			*[Medium]*			*[Low]*	
	7	*6*	*5*	*4*	*3*	*2*	*1*	*N/A*
1. Gathering information about customers' online purchasing behaviour								
2. Increasing revenues from electronic channels								
3. Changeable (flexible) organisational structure								
4. Web-specific marketing								
5. Expansion of current markets								
6. Rapid delivery of products/ services (quicker than usual)								
7. Fast responsive and integrated business processes								

Continued

	Criticality							
	[High]			[Medium]			[Low]	
	7	6	5	4	3	2	1	N/A
8. Availability of human/financial resources								
9. Personalising products/services/ advertisements								
10. Support for e-commerce from top management								
11. 24 × 365 days availability of service								
12. Offering incentives to customers to conduct business on Internet								
13. User-friendly and attractive web site								
14. Secure web site and other related systems								
15. Gathering useful information about customers								
16. Fast responsive customer service (better that usual)								
17. Selecting software systems from a single vendor								
18. Integration of information systems								
19. Flexible workforce ready to adapt to new business models								
20. Promotion of electronic commerce culture in the organisation								
21. Selecting and mixing best software products from different vendors								
Other factors (please specify):								

N/A – Not applicable.

Q 4. Which factors are most critical to the **failure** of any of the online services within your organisation? *Please ignore this question if* ***all*** *of yourInternet base-dservices have been successful*. (See notes on Q4) Please answer all questions and put only one tick for each question.

	Criticality							
	[High]			[Medium]			[Low]	
	7	6	5	4	3	2	1	N/A
1. Lack of support from top management								
2. Lack of fast responsive business processes								
3. Difficulties in personalising products/services/on the web								
4. Lack of incentives to customers to conduct business on the web								
5. Project management failure								

Continued

	Criticality							
	[High]			[Medium]			[Low]	
	7	6	5	4	3	2	1	N/A
6. Existing information systems unable to support e-commerce								
7. Difficulties in integration of information systems								
8. Security problems								
9. Difficulties in promoting E-commerce culture in the organisation								
10. Difficulties in educating and training people								
11. Resistance from employees and partners								
12. Lack of customer's interest								
Other Factors (please specify):								

N/A – not applicable.

Q 5. Is there anything else relevant to management of online financial services not covered in this questionnaire? If yes, please describe it below and continue on a separate sheet if necessary. (See notes on Q5)

……
……
……
……

Q 6. Would you like to receive a summary of the findings from this research? (See notes on Q6)
Yes [ ] **No** [ ]

Q 7. Would you like to discuss further issues related to this questionnaire? I am willing to visit you by appointment on a strictly confidential base. The interview will last for approximately 45 min. (see notes on Q7)
Yes [ ] **No** [ ]

Notes related to questionnaire

Q 1. If you offer any of the services listed in question two, on the Internet or via another electronic channel, please tick yes.

Q 2. These are typical online financial services offered by many financial services organisations. Please choose which of these you offer or intend to offer in the near future?

Information Only: Details of information about products/services offered by the organisation and/or online checking of account information (i.e. current balance or recent transactions).

Retail banking services: Electronic payment, money transfer between accounts, loan arrangements, credit card issuing etc,

Insurance: Quotations and sales online.

Mortgages: Online sales of mortgages.

Business Services: Business account management services (similar to those of retail services) digital certificates, smart cards etc.

Brokerage: Facilities for online purchase and sales of shares.

Q 3. Please evaluate the factors (given in the table) which were/are critical in the success of e-commerce in your organisation. Critical Success Factors (CSFs) may be defined as 'a limited number of areas in which, satisfactory performance is crucial to the success of an initiative, i.e. the offering of financial services on the Internet'.

Q 4. Please evaluate in terms of criticality the factors, which led to the failure or less than satisfactory performance of any Internet base service in your organisation.

Q 5. Please use this space to cover the issues which you think have not been provided for elsewhere in the questionnaire.

Q 6. If you wish to receive a synopsis of the results from the questionnaire, please make sure that you have given at least your email address in the personal details table.

Thank you very much for filling in this questionnaire which will be used in strict confidence. Please send the completed questionnaire or any queries to: Contact Details of Researchers

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