ICT Adoption and Use in UK SMEs: a Failure of Initiatives?

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Abstract: In this paper, we explore some of the results from a survey of 378 small and medium sized enterprises (SMEs) based in the southeast of England. The objective of this survey was to build a snapshot of the state of play of the information and communications technology (ICT) use by SMEs in economically significant sectors in this region. The sectors chosen were as follows: food processing, transport and logistics, media and internet services. More specifically, the survey was intended to answer the following questions: what types of ICT are in use by SMEs in this region, what prevents and facilitates the adoption and use of ICT amongst these firms, and where do SMEs acquire information on ICT related issues. Our survey suggests that most SMEs in the southeast of England are in general positively inclined towards adoption and use of ICT. However, this adoption and use of ICT is mainly focused on operational matters with few extensions into potential strategic use of such technologies in their business environments. SME owner/managers perceive ICT to be often costly and complex and are wary of consultants and vendor organisations. We also discovered, somewhat surprisingly, that SMEs are largely unaware of existing policy instruments at the regional, national and European levels, designed to help them in their adoption and use of ICT.

Keywords: Information and communications technology (ICT), small and medium sized enterprises (SMEs), ICT adoption, ICT use, government policy

1. Introduction

According to the Observatory of European SMEs (2003), 92% of all European enterprises employ less than 10 people. Both EU policy and UK regional development agencies have sought to actively promote small and medium sized enterprises in the country with the aim of bolstering competitiveness and encouraging collaboration with like-minded businesses, providing the basis for innovation and accelerated growth. For instance, the Southeast England Development Agency (SEEDA) has called for a 'southeast commitment to mirror the EU's ambition of becoming the most competitive knowledge-based economy by 2010' (SEEDA 2003). An important part of this ambition is to facilitate the competitive ability of SMEs increasingly operating in the global market. SMEs can be viewed as the poor sibling of the business community compared to their larger brethren. Much of the focus on ICT is predicated and driven by the needs of large businesses often ignoring the more diverse needs of SMEs.

This paper aims to addresses some of these issues using a survey of SMEs in the southeast of England. The paper is structured as follows: the next section provides a brief overview of the key characteristics of the SME community and the literature on their adoption and use of ICT. This is followed by a discussion of our research methodology. We then present some of our main findings. The paper concludes with a discussion of the implications of these findings for both the SME community and policy providers.

2. ICT and SMEs

The most widely used definition of an SME is that of a firm with 0-250 employees (DTI 2007). SMEs have started using ICT relatively recently and they are generally characterised by inferior technology and management capabilities (Caldeira and Ward 2002). Also, as Pool *et al*. (2006) note, whilst e-commerce (i.e. the use of Internet related ICT for business) has spread rapidly throughout large firms, its growth amongst SMEs has been much less pervasive. Indeed the need to build ICT-related capabilities and competencies within European SMEs was specifically identified by a recent report from the Observatory of European SMEs (2003).

Research into SME use of ICT within the UK context has been limited to a few studies that are now dated (for instance, Thwaites and Wynarckzyk 1993; Naylor and William 1994; Levy, Powell and Yetton 2001; Martin and Matlay 2001; Simpson and Docherty 2004). Whilst, the SME sector is very heterogeneous, at least some of these studies found strong correlation between IT use and firm size, innovation, product development and R&D in traditional sectors such as textiles in the UK, implying that SMEs are at a disadvantage in terms of IT use. Strong regional differences were also found within the UK between SMEs clusters in innovation rates, profitability, size and structure of ownership. It appears that significant differences remain between SMEs. For example, a recent survey of their region by Yorkshire Forward, the

Regional Development Agency, found that whilst 63% of SMEs were connected to the Internet, 46% had a website and 36% traded on-line, 30 % (mostly microbusinesses of less than 10 employees) did not use computers at all (Pritchard 2006). Whilst opting out of the digital economy may be possible for some, Brown *et al.* (2005) point to the problems that some SMEs face whilst engaging in on-line trading or collaboration with supply chain partners. They argue that the complexity of business operations as well as company size matter in respect of ICT adoption and use in SMEs.

Synthesising the wide-ranging literature on e-commerce adoption and adoption models, Wymer and Regan (2005), identify 26 factors affecting ICT adoption and use in SMEs. It is possible to classify these as either technology related or business related (including external factors, internal knowledge and expertise, and finance). Their findings (from a study of US SMEs) show that, perhaps unsurprisingly, cost was the one consistent factor across all organisational types.

According to Levy, Powell and Yetton (2001), the vast majority of literature on ICT adoption by SMEs point to the operational nature of investments, driven as they often are by cost and efficiency considerations. However, the same research team has also found evidence that SMEs can also behave strategically; their empirical study of SMEs in the UK West Midlands finding that strategic intent influences decisions to invest in e-business (Levy, Powell and Worrall 2005)

Thus, there is something of a confused picture with regard to current practices within UK SMEs in relation to ICT use. Given that both markets and technologies have undergone rapid change over the last few years, the time seems ripe to revisit this issue.

3. Research methodology

The population for the survey was SMEs drawn from four economically significant sectors in one of most productive regions in the UK, the southwest London and Thames Valley region of England. The sectors chosen were: food, transport and logistics, media, and the Internet. See table 1 for a sector breakdown. The survey targeted 2800 companies chosen from the Dunn and Bradstreet list. We received a total of 378 responses.

Table 1: Breakdown of firms

Sector	Proportion of firms (%)
Food processing	24.46
Transport and logistics	26.46
Media	23.81
Internet	23.28

We used a telephone survey method with a standardised questionnaire of 66 questions organised into 6 major sections: business specific questions, current ICT use, use of Internet and e-commerce, ICT investments, staff skills and training for ICT use, and ICT advice. Most of the questions were of a “tick box” format although each question also gave the respondent the option of providing additional comments. A number of follow-up interviews were also conducted to explore issues arising from the survey findings.

The business specific questions asked for company and respondent details as well as questions on firm size, firm history, firm’s main products and services, key customers and markets. We also asked respondents questions concerning what they perceived to be their key business strengths (e.g., low cost, product quality, innovation, other specialised expertise etc), main business plans (in terms of increase in sales or market share etc), and whether the firm had any formal strategy documentation.

Questions on current ICT use focused on types of ICT used (such as email, Internet, wireless etc) and kinds of ICT applications (stock control, sales, marketing, human resources management, enterprise resource planning etc). This section also included questions on business benefits from ICT, key ICT problems faced by the company and a question on whether the firm’s ICT investment represented value for money.

The section on Internet and e-commerce usage asked a series of questions on the type of Internet connection used, whether the firm used the Internet for online sales/purchase or for information gathering and sharing, and whether the Internet had any impact on sales (for example through increased sales). We also asked a question on e-commerce challenges faced by the firm.

The section on ICT investment included questions on the firm's IT strategy, how they funded and justified their ICT investments, choice of ICT supplier, and a series of questions on ICT implementation and post-implementation evaluation. We also asked about any implementation challenges faced by the organisation.

The section on staff skills focused on existing IT skills, skills shortages, how training was provided and any barriers to the provision of such training. The final section on ICT advice sought replies on where the firm obtained ICT advice, and if they had sought help or advice from government agencies.

In this paper, we will mainly focus on the key findings from the four sectors covered in the survey.

4. Results from the survey

In this section, we present some of our main findings from the survey of the food, logistics and transport, media, and Internet sectors. We found some interesting differences between what we could characterise as 'traditional' sectors (food, transport and logistics) and 'new' sectors (media, and Internet).

4.1 Commonly used ICT applications and reasons for investing in ICT

Table 2 provides details of the commonly used ICT applications in our survey, split according to sector. As can be seen most firms in our survey concentrated primarily on operational and functional applications such as sales and marketing and document management systems. Interestingly, 'older' sectors of logistics and food processing recorded higher levels of computerisation in their human resources management function. This may be related to the higher levels of government regulation of these sectors. Compliance requirements in these sectors seemed to be driving much of the more recent investment in new ICT applications in both these sectors.

As we would expect, there was near universal adoption of email and Internet facilities. However, there was a very low take up of allied adoptions of a more strategic nature such as enterprise resource planning (ERP) systems. As table 2 highlights, the sectors displaying the highest levels of ERP adoption were the 'new' sectors of media and Internet services. By contrast, there was a very low level of adoption of such technologies in the 'older' logistics and transport and food processing sectors.

Table 2: Commonly used ICT applications

	Computerised Systems Used (*number of replies*)							
	stock control	sales or marketing	design	market research	document management	production planning & control systems	HRM	ERP
Media	35	61	69	36	70	56	39	28
Logistics	29	67	17	28	91	44	54	21
Internet services	17	80	77	56	79	47	48	35
Food processing	77	74	41	40	94	57	56	19

The lack of strategic intent in the adoption of ICT is shown more clearly in table 3. Here, we detail the SMEs' responses and motivations for investing in ICT. Once again, we can highlight the mostly operational nature of these ICT investments, driven as they are by the need to increase operational efficiency. This is not surprising given the often highly competitive, low margin, business environment in which many SMEs operate and the consequent need to continually bear down on costs.

Having said this, it is again worth emphasising that some of the more sophisticated use of technology was found in the 'older' sectors of food processing and logistics and transport. In subsequent follow-up interviews, a motivation for this more sophisticated use was attributed to the need for compliance with government and European legislation in both sectors. More specifically, in food processing sector, new regulations require SMEs to be able to demonstrate the traceability of their food products in terms of the supply of ingredients used in their products. In the case of the logistics and transport sector, new European directives required firms to be able to log transportation drivers' total driving time on a daily basis so as not to exceed legislated maximum driving time.

Table 3: Reasons for investing in ICT

Main Reasons For ICT Investments Made Recently *(%)*						
increase operational efficiency	improve communications with suppliers	improve enhance customer service	keep up with competitors	enhance joint working in collaborative ventures	increase staff satisfaction	because customers demanded it
83	25	45	34	23	33	19

4.2 Barriers to ICT adoption

The majority of the SMEs surveyed identified costs as the single biggest factor threatening future investment in ICT. This perception can be explained with reference to the funding sources open to the SMEs in our survey. We found that most SMEs sourced their ICT capital expenditure through retained profits. In very few cases were alternative sources of funding such as venture capital and commercial loans used by SMEs. This can be explained by the very cautious approach that SME owner/managers often adopt with respect to ICT investments, particularly when they have difficulty quantifying or envisaging the business benefits that might arise from such investments.

We found that owner/managers by and large were not ICT trained or skilled and were often reliant on the advice of external consultants or vendor organisations. This tended to affect the confidence with which they approach investment decisions concerning ICT. Part of this cautious attitude to ICT can also be explained by the lack of internal ICT expertise in these firms. We also found that while staff in many SMEs were often keen to train in ICT, the lack of resources and uncertainty over business benefits from the perspective of the owner/manager hampered the development of internal capabilities in this area.

Interestingly, we found that barriers to ICT adoption were mostly related to costs and skills rather than to do with problems with the technology per se. Only a minority (about 25%) of firms reported technical problems sufficient to act as a barrier to future investments.

4.3 Perceived benefits from ICT

Most of the SMEs surveyed were generally satisfied with their ICT investments. In fact over 90% of the firms in all four sectors surveyed perceived their ICT investments as offering good value for money. In the case of the Internet services firms, this figure rose to almost 98%. How then does ICT affect these SMEs?

Table 4 highlights some of the key perceived benefits from ICT adoption. As can be seen, most of the benefits relate to operational matters. In particular, all four sectors see ICT as helpful in improving the response time to customers. In three out of four sectors, ICT was also helpful in improving productivity. The exception to this was the logistics and transport sector, which reported lower levels of perceived benefit in this respect. All four sectors also perceived ICT as important and helpful in keeping up with their competitors. In this sense ICT could be deemed to be having a strategic impact. However, when seen in the context of the overall survey results, we were unable to find clear evidence of strategic impacts. For example, in the development of electronic commerce, firms in our survey restricted themselves to providing information portals rather than using ICT to extend their business environment into the electronic domain.

Table 4: Perceived benefits from ICT

	Perceived ICT Benefits *(number of replies)*					
	improved productivity	improved product/ service quality	faster response to customers	improved customer satisfaction	improved working on joint projects with other firms	keep up with competitors
Media	77	75	79	71	54	81
Logistics	56	77	75	62	34	72
Internet services	78	79	79	76	66	77
Food processing	71	60	78	67	45	83

Having said this, the impact of online sales, where evident, differed between the old and new sectors. In the media and Internet services sectors, we found comparatively greater use of online sales than in the 'older' logistics and food processing sectors. In the 'older' sectors, the vast majority of SMEs made very little or no

use of online sales than in the 'newer' sectors. Unsurprisingly, the highest impact of online sales was felt in the Internet services sector with just under 50% of the firms reporting that half or more of their sales stem from online sources.

4.4 Information sources on ICT use

The single most important information source for SME owner/managers in our survey was ICT consultants. Almost 50% of firms irrespective of the sector used external consultants in ICT matters. The second most important source of ICT advice and support was friends and family (37% of firms surveyed), followed by ICT vendors (35% of firms). Professional independent sources such as trade associations (8% of firms) or government agencies (4% of firms) seemed to have very little influence on our SMEs. Indeed the media had more of an impact as a source of advice (10% of firms) for our SMEs than these other independent sources.

This finding surprised us given the range of policy mechanisms aimed at SMEs as shown in table 5. Most of the SMEs surveyed had very little or no knowledge of these mechanisms designed to help them. Indeed, those that had used some of these mechanisms did not report a happy experience. In follow-up interviews, respondents pointed to the often bureaucratic and cumbersome processes that they had to engage in order to receive advice that was often not tailored to their business environment.

Table 5: Awareness of government policy mechanisms

Government Agencies Used (*number of replies*)						
business link	e skills into Business (sector development agency ESIB)	central government DTI trade partners UK	regional development agencies (SEEDA)	local government agencies borough or county council	learn direct IT courses	None used
73	1	11	7	5	4	268

5. Discussion and conclusions

From the survey, we identified a number of other key problems faced by SMEs with regard to ICT adoption and use. These can be grouped into two categories: technology related and business related.

In terms of technology, the most important concern was a fear of technology obsolescence requiring frequent updates. In the cash-poor, highly competitive context in which SMEs operate, the need to find funding for updates was a real concern. Firms also frequently encountered operational problems with their ICT exacerbating their dependence on external consultants or vendors. This dependency on consultants and vendors was often cited as a major problem by SME owner/managers who are more focused on making the best use of limited resources in terms of time and money. ICT often competes with more pressing business concerns. Owner/managers typically do not view ICT as offering them long term solutions to business sustainability.

Turning to business issues, our survey suggests that SMEs are often driven by the pressures of cost and efficiency. There is a need to retain competitiveness by driving down costs rather than increasing value-added. The SMEs in our survey had very little strategic flexibility and their ICT investments reflected this narrow perspective. Where sophisticated ICT applications were found, these were often driven by the need to comply with government regulations rather than through any considered attempt at using ICT strategically. We found this effect was most prevalent in the 'older' sectors of transport and logistics and food processing as opposed to the 'newer' media and Internet services sectors.

As often highlighted in the literature on SMEs, owner/managers often determined the nature and extent of ICT investments. Indeed in most cases owner/managers did not have a strong ICT background or the skills necessary to judge the potential of ICT investments. Many of them are also uninformed about the variety of support mechanisms available through regional and national agencies targeting SMEs. This information and capability gap is further entrenched by the lack of internal ICT champions in SMEs themselves.

In summary, our survey findings suggest that SMEs need to think more strategically in relation to the use of ICT. In this respect, SMEs are falling behind best practices adopted by their larger counterparts in the global economy. Agencies charged with the development of SME capabilities also need to reorient their delivery mechanisms to address the ICT capability and information gaps identified in this survey.

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