

# National Survey of SMEs' Use of IT in Four Sectors

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**Abstract:** This paper examines the adoption and use of information and communication technology (ICT) in small and medium sized enterprises (SMEs) across four sectors in the UK. In the paper we report on a survey that explores the factors facilitating or hampering the successful adoption and use of ICT by SMEs. We find that SMEs are generally satisfied with their investments in ICT but that they are concerned about the cost of such investments and are uncertain about the business benefits. Much of the investment in ICT is directed at meeting bottom line issues of cost and productivity but little use is made of potential strategic applications. A particular case in point is the diffusion of ecommerce in which firms report increased consumer interest but there is little evidence in the survey to suggest that interest is being actively managed by SMEs. One concern that emerges from the survey is the SMEs' perceived dependency upon consultants. SMEs appear to be encountering knowledge/competency gaps related to ICT. They may be too small to be able to employ a dedicated ICT expert and lack the experience to have confidence in its reliability of consultancy advice. They often have limited experience in selecting, implementing and evaluating suggested ICT solutions. To help correct this gap in the provision of services, the government has tried to provide support with mixed success. Certainly, the UK government has had a strong interest in helping and supporting the SME sector. However, State sponsored solutions to meet this competency gap appear to be failing with little awareness or take up of such solutions by the SMEs that we surveyed. Something that remains unclear is whether this failure by SMEs to avail themselves of advice and guidance made available by the State reflects the quality of solutions offered or a more basic lack of awareness by SMEs.

**Keywords:** SMEs, ICT, technology adoption, ecommerce

## 1. Introduction

Small and medium sized enterprises (SMEs) are an important part of the UK economy. Out of the nation's 4.3 million business enterprises 99% are SMEs, accounting for well over half of employment (58.9%) and turnover (51.9%) (DBERR, 2007). At both the European Union (EU) and national level, SMEs lie at the heart of policy making with the emphasis on encouraging enterprise and promoting business growth. SMEs are an important link to boosting the levels of innovation in the national economy and fostering greater competition both domestically and increasingly, internationally.

In this context, the adoption and use of ICT is widely seen as critical for the competitiveness of SMEs in the emerging global market. Given this backdrop, how can SMEs better equip themselves to use ICT? Are SMEs in the UK making adequate use of ICT? What factors enable or inhibit the successful adoption and use of ICT by SMEs? This paper addresses these issues through a survey of SMEs in the UK. The aim was to identify the diffusion of ICT within the SME community and to build a picture as to how SMEs currently use ICT in their business

## 2. ICT adoption and use in SMEs, a brief review of the literature

We know that SMEs generally struggle with limited resources in terms of time, money and expertise (Wymer & Regan, 2005). Juggling competing demands, SMEs are often cash poor and most lack the range of internal expertise available to the large firm. It is the skill and enthusiasm of the owner-manager that typically drives the business forward and shapes the character of investment decisions. We also know that most SMEs lag behind the large firms in their use of ICT, both operationally and strategically. SMEs characteristically lack the managerial skills to conceive, plan and implement ICT and reluctantly update technology (Caldeira & Ward, 2002). Constrained by resources, hemmed in by competing demands, caution and suspicion often greet new technological opportunities. Large firms for example, have adopted ecommerce much faster than SMEs (Pool *et al.*, 2006).

Nonetheless, a number of studies have found a strong relationship between ICT use and firm size, innovation, product development and R&D in traditional sectors such as manufacturing and clothing in the UK. The implication being that in terms of ICT use, the smaller size of the SME places it at a disadvantage to the larger firm. Not all SMEs are alike; they differ regionally in a number of key characteristics including innovation rates, profitability, size and ownership structure. This affects technology adoption rates. For

example, in Yorkshire whilst 63% of SMEs were connected to the Internet, 46% had a website and 36% traded on-line, 30 % (mostly micro businesses with less than 10 employees) did not use computers at all (Pritchard, 2006). Those SMEs that do decide to opt into the digital economy often encounter further problems stemming from the complexity of their business operations when seeking to enter on -line trading or collaboration with supply chain partners (Brown *et al.*, 2005).

Much of the research on ICT adoption by SMEs finds investment driven by the operational concerns of cost and efficiency (Levy *et al.*, 2001). However, ICT decisions are not necessarily an exclusively operational agenda. ICT also offer the SME the potential to improve other dimensions of business performance such as innovation, marketing, quality and customer responsiveness. There is some, albeit limited, evidence that SMEs *can* behave strategically. In the West Midlands for example, some SMEs considered strategic intent when considering investing in e-business (Levy, Powell & Worrall, 2005). Although far more commonly, the owner-manager's attitude and lack of relevant knowledge and skills drives ineffectual strategic use of ICT (Pavic *at el.*, (2007). This tends to make UK SMEs as a group reactive to technology adoption rather than proactive.

There is certainly evidence that SMEs are reacting with caution to the possibilities of ecommerce, considering it a high-risk strategy (Al-Qirim, 2005), introducing ecommerce very slowly into their existing set of operations (Eriksson & Hultman, 2005). Often, SMEs may not view ecommerce as strategically important (Bharadwaj & Soni, 2007), although this may not be the case for all SMEs. A European report suggests that some SMEs are beginning to see ecommerce in a strategic light (E-Business Watch, 2004). The net effect however, is to suggest that all in all SMEs lag behind the pace of technological change as set by the larger companies.

### **3. Methodology**

Data for this survey was collected using a structured questionnaire administered through telephone interviews. A contact list was generated using the FAME database, with respondents selected on a random basis. The survey concentrated upon four economically significant UK sectors populated by high numbers of small and medium sized firms: food preparation, clothing, manufacturing and financial services. For manufacturing we used SIC codes 30-33 to give us a focus on high technology manufacturing (electrical, optical and communications equipment). The telephone survey was conducted by a UK based software consulting company, and ran from March to August 2007. In total, we approached 4380 firms and 519 firms gave us usable replies. Of those 519 firms, 245 replies were received from manufacturing, 110 from financial, 85 from clothing and 79 from food processing.

The typical respondent was either the owner-manager or the designated person responsible for ICT. Together they accounted for 69% of all respondents. In three out of the four sectors surveyed, the majority of firms were quite large (50+ employees) within the SME context. The exception to this is the financial sector in which a majority of firms employed 10-50 people. Our findings are thus weighted towards the small to medium firms' spectrum rather than the micro firm. Most of our respondents (80%) are firms that have successfully traded for ten years or more. Finance again proved the exception with a slightly lower preponderance (60%) of long lived firms. Generally, the firms that we report on in this paper are mature, long established businesses.

### **4. Key findings**

Here we report on the findings from the survey. For reasons of brevity we concentrate on the general results across the sectors but where important differences emerge, we will also report on individual sectors. Perhaps the first thing to note about the firms surveyed is that they are overwhelmingly in favour of ICT. A very high majority (93%) considered their investment in ICT to be good value for money. Such investment was most likely to have been less than £10k during the previous year.

#### **4.1 Types of technology implemented and application use**

Figure 1 shows the type of ICT used by the SMEs in our survey. Across all four sectors, firms reported extensive use of email, internet and company websites. Most of the firms were also large enough (10+ staff typically) to justify an internal network and many had put in place their own intranet. More surprisingly, the survey also reveals reasonably high rates of use of wireless technology. However, a much smaller proportion of surveyed SMEs use more complex technology such as an extranet or electronic data interchange (EDI).

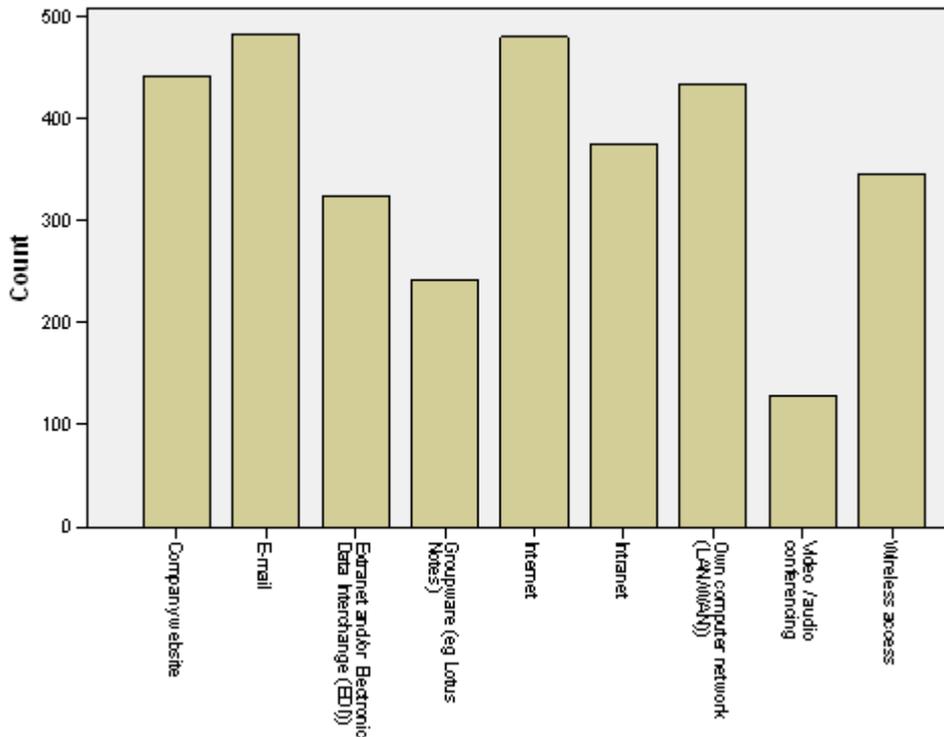


Figure 1: Type of ICT adopted

As Figure 2 shows, ICT was most popularly used to automate the recording of sales and the processing of orders received. A high proportion of the 519 firms surveyed also used ICT in general accounting and finance tasks, as well as in document management. Somewhat unexpectedly, the automation of accounting and finance tasks appears to lag behind the recording and processing of sales and orders. Computerisation levels in other tasks such as human resource management, production control and enterprise resource planning (ERP) were more modestly spread across the firms surveyed, as too in business intelligence and design.

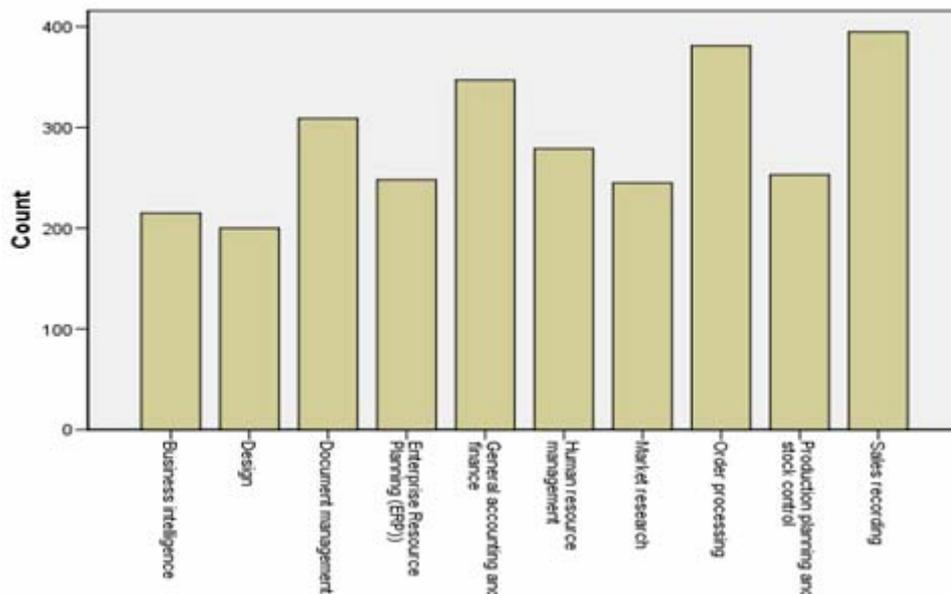
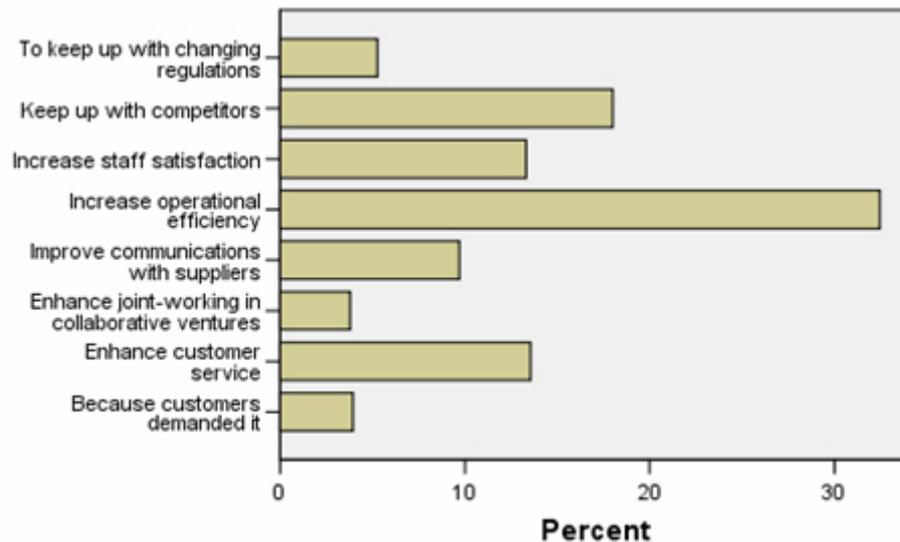


Figure 2: ICT application

#### 4.2 Motivations and barriers for ICT use

What do the SMEs in our survey hope to gain from their investment in ICT? General motivations for ICT investment are shown in Figure 3. The answer to this question for many of our SMEs (almost 40%) is to increase their operational efficiency, followed by keeping up with competitors (about 20%) and then more or

less equally to improve customer service and improve staff satisfaction (both about 13%). Very few of the SMEs surveyed invest in ICT because of external pressure, either from the authorities or from customers. When we look at the responses within each sector, some exceptions to this broad pattern emerges. First, manufacturing SMEs are more likely to invest to try to keep up with competitors than any other sector (61% of SMEs in manufacturing compared to 30% in financial and food and 40% in clothing). Second, investing in ICT to increase staff satisfaction is the second most popular reply in finance (41% of SMEs) and clothing (34%). Third, investing to keep up with changing regulations appears as a reasonably important factor for manufacturing and food (16 and 19% respectively) but is unimportant in clothing (only 5% of clothing SMEs).



**Figure 3:** General motivations for ICT investment

We also questioned SMEs as to their perceived barriers to ICT investment. Figure 4 shows the aggregate replies that we received to this question. Unsurprisingly, cost was the largest single barrier cited by firms in our survey (about 34%). More interestingly, SMEs also cited uncertainty over the benefits to their business as a factor (25%). When we asked firms whether they used any form of formal investment techniques to evaluate ICT investments, the use of such techniques varied with the sector. Perhaps most surprisingly, just 24% of all SMEs in the finance sector applied formal techniques compared to 45% of SMEs in both clothing and manufacturing and a much higher 57% of SMEs in the food.

The broad patterns identified in the preceding paragraph also hold when we look at the individual sectors. There is however one exception. Whereas the SMEs in the clothing, food and manufacturing sectors identify their three most popular barriers to be costs, uncertainty and competing priorities, SMEs in the finance sector have a slightly different ordering. Here, the third most popular barrier is concern over security (32% of SMEs in the sector). This barrier does not appear to be strong in the other sectors, with the range of replies varying from 8% (clothing) to 14% (manufacturing).

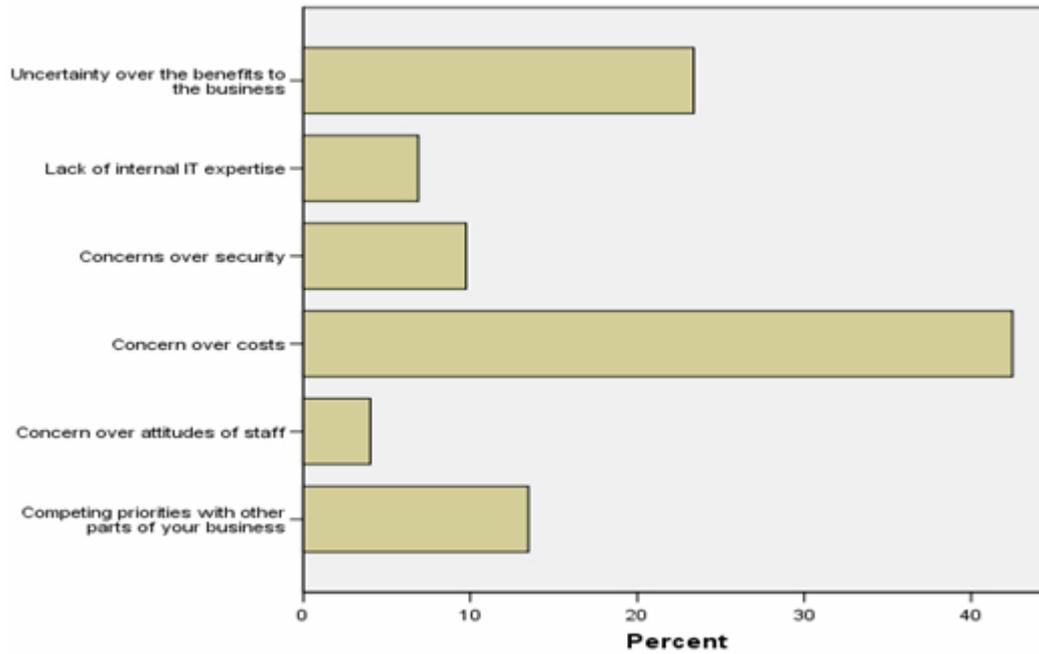
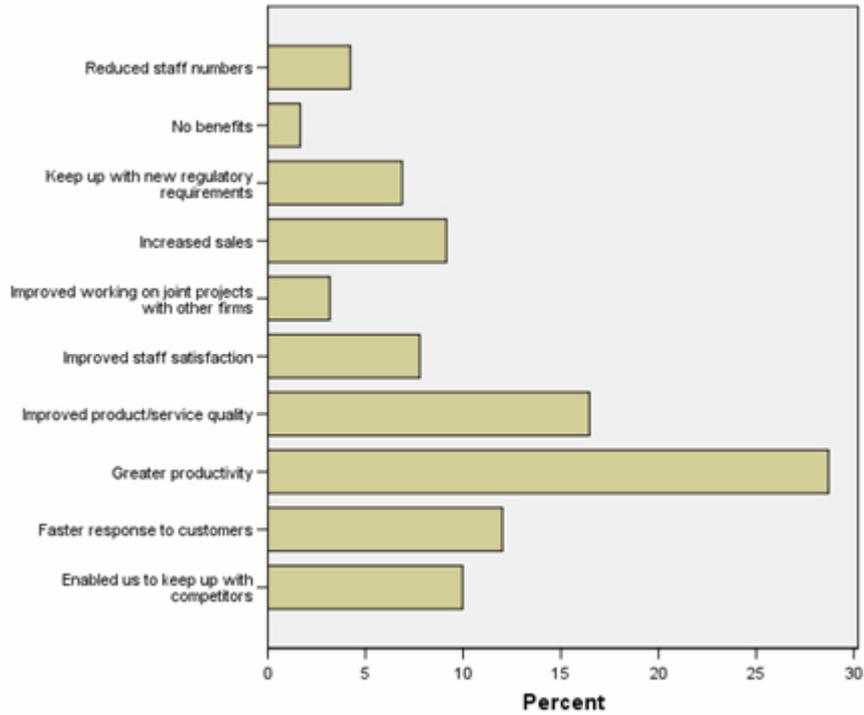


Figure 4: Barriers hampering ICT investment

### 4.3 Experience of ICT

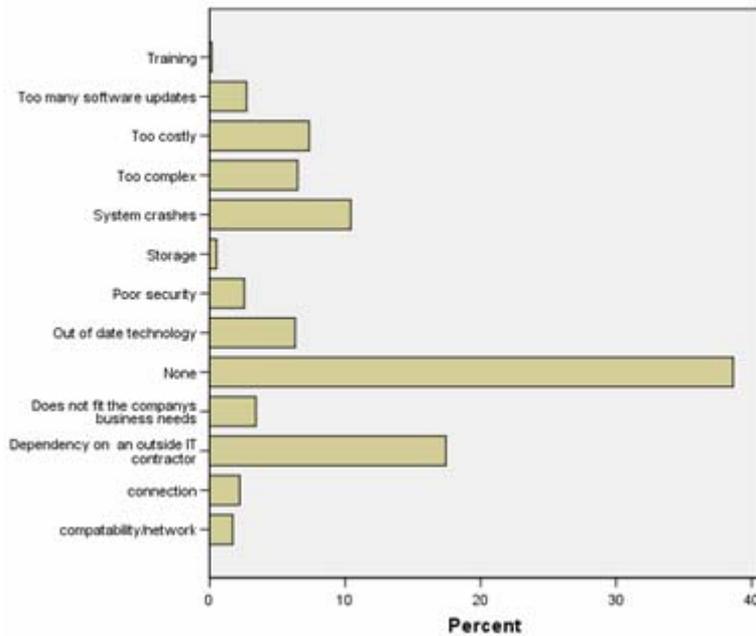
Here we report on the actual benefits and problems encountered with their ICT investments by our respondents. Mindful of the high levels of satisfaction over value for money (93%) reported previously, the flip side to this statement is the very low proportion of SMEs reporting no business benefits arising from ICT adoption (less than 3%). As our next figure shows (Figure 5), the most popular benefit experienced as a result of ICT adoption is greater productivity. Close to 30% of all replies highlighted productivity as a benefit. The second most experienced benefit is improved quality of service or product and then related to this, a faster response time to customers. More surprisingly given the supplier and sub contract nature of much of the SME sector, the firms in our survey did not typically report improved collaborative working with other firms as a benefit of ICT adoption. Similarly, given the tight resource constraints that SME generally work under, ICT does not appear as a popular vehicle to reduce staff numbers. At least, if that is an intention of ICT adoption, it does not appear to be realised once adopted.

Again, if we turn to the sectors themselves, the broad pattern outlined above holds with some exceptions. First, it is striking that the SMEs in the clothing sector are far less likely to report improved collaboration (1%) than the other sectors (between 10-11%). Second, both clothing and manufacturing SMEs report in proportionately larger numbers (13-15%) that ICT has enabled them to reduce staff numbers than SMEs in finance and food (about 10%). Finally, SMEs in the clothing and food sectors are less likely to report that their ICT has yielded no business benefits (less than 3%) than SMEs in manufacturing and finance (about 6%).



**Figure 5:** Benefits gained from ICT

Given the high levels of satisfaction, it is perhaps unsurprising that the single largest group of SMEs in our survey report no problems with their existing ICT systems. As Figure 6 shows, almost 40% of all the firms that we surveyed report no problems. Of the problems reported, the most pressing difficulty is dependency on an outside ICT consultant (almost 20% of all replies), followed by system crashes (about 12%). Less problematic appears to be cost and technical complexity issues. Cost is particularly interesting here because in the previous section, respondents highlighted cost as a barrier to potential investment in ICT. However, according to the experience reported on here, managers are possibly over exaggerating cost as a barrier. The more technical problems of storage, security, connection and network compatibility are not issues highlighted in our survey.

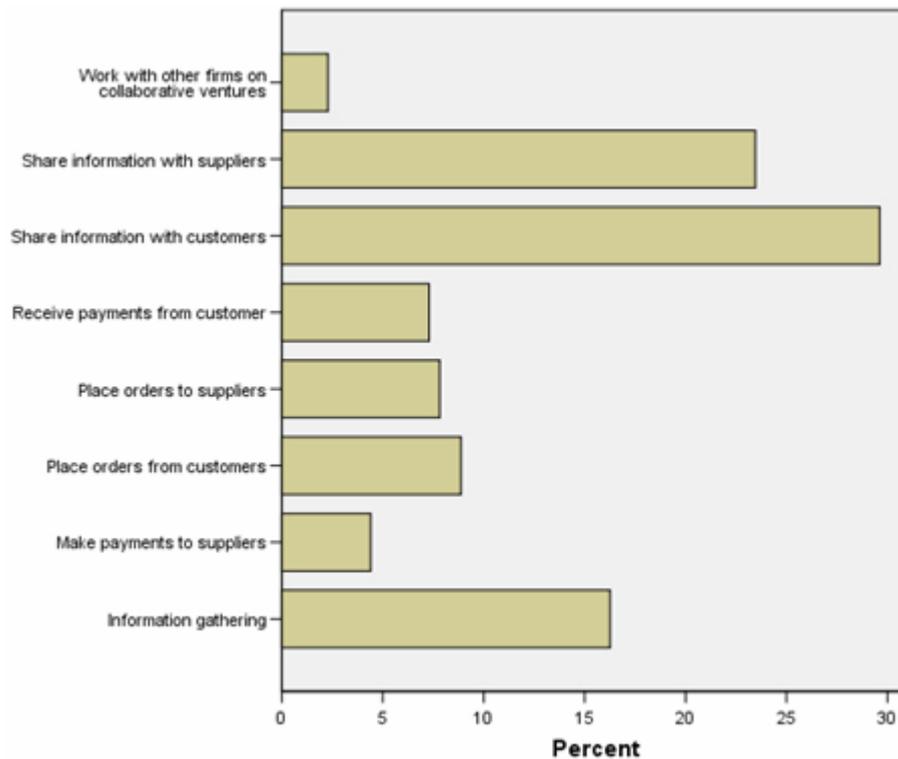


**Figure 6:** Reported problems with existing systems

#### 4.4 Ecommerce and use of the internet

In our survey, 78% of all SMEs used the Internet in their business either to attract customers or to help communicate with suppliers or other firms. Manufacturing recorded the highest percentage of use with 82% of all SMEs in that sector using the internet and clothing the least with 71%. Generally, across all four sectors, SMEs use the internet by a very high majority. Of the SMEs that are not using the internet in their business, very few (less than 5%) have plans to introduce the internet in the next three years.

What are the firms we surveyed doing with the internet? Figure 7 shows that in general, the SMEs in our survey are using the internet to share information with both customers and suppliers but particularly customers. They are also using the internet to gather information on the activities of their competitors, their sector and their markets. However, what is also evident is that the SMEs are not using the internet in high numbers to make or receive either orders or payments. Across all four sectors, there is a poor diffusion of automated ordering or payments using the internet. Figure 7 shows that SMEs in aggregate are using the internet in slightly higher proportions on the customer side and less so with suppliers but in both cases, the numbers involved are proportionately low.

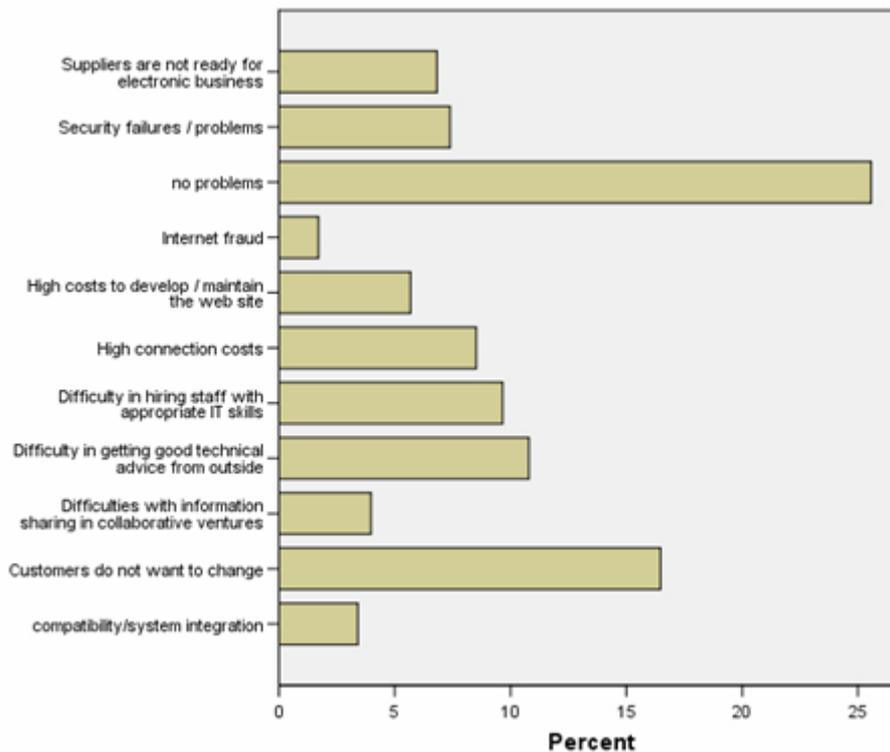


**Figure 7:** Reasons given for using the internet

Turning to the individual sectors, again the broad pattern holds with some exceptions. Across the sectors, all report high rates of using the internet to share information with customers (at least 80% of firms in the sector). The highest rate of use is in food where 95% of SMEs surveyed use the internet to provide information to customers. Food also makes the highest use of the internet to share information with suppliers (82% compared to 66% of all SMEs in manufacturing). In contrast, manufacturing firms make the highest use of the internet to place orders from customers (30% of all manufacturing SMEs). Consistent with this, manufacturing SMEs also report greater use of the internet to receive payments from customers (26%). Finally, SMEs in the financial sector are most likely to use the internet to gather information (63%); whereas manufacturing SMEs are least likely (43%).

What have been the problems and challenges that the SMEs in our survey have found in implementing ecommerce? When looking at the aggregate responses in Figure 8, perhaps the first point to note is that more than 25% of the firms in our survey encountered no problems. The biggest barrier to putting ecommerce in place appears to be persuading customers to change. Interestingly suppliers appear as a lower barrier to customers. Following customers, expertise and skills appear as a set of issues whether expressed as the difficulty of getting good technical advice from outside or the problem of lack of appropriate

internal staff. In contrast, connection costs and security failures appear less inhibiting as a barrier to ecommerce for most of the SMEs surveyed.



**Figure 8:** Challenges in Ecommerce implementation

We find that this broad pattern just discussed fragments more readily when examining the responses of SMEs within individual sectors. Looking across the sectors, each sector displays a varying pattern of responses. Clothing SMEs for instance, identified difficulties in hiring appropriate staff as the single most popular barrier to ecommerce implementation (33%) and failed to identify customers as a barrier at all. Similarly, finance SMEs found it more difficult to hire in good technical advice from outside (25%) compared to customers resistance (17%). SMEs in the finance sector also cite high connection costs as the second most popular barrier to ecommerce use. In contrast, 38% of all SMEs in the food sector and 27% of manufacturing SMEs identified customers as the single largest barrier.

The results from our survey suggest that the effect of the internet appears focused on attracting new customers rather than boosting sales from existing customers. Almost 50% of the SMEs who used the internet found that it had attracted sales from within the UK. Just over 25% found that the internet had attracted new customers from outside of the UK. All four sectors identify attracting new UK customers as the most popular effect of the internet on sales. The food sector produces the most pronounced trend in this respect, in which 74% of all SMEs here cited increased UK customers. By contrast, 52% of SMEs in manufacturing cite an increase in UK customers as an effect of the internet.

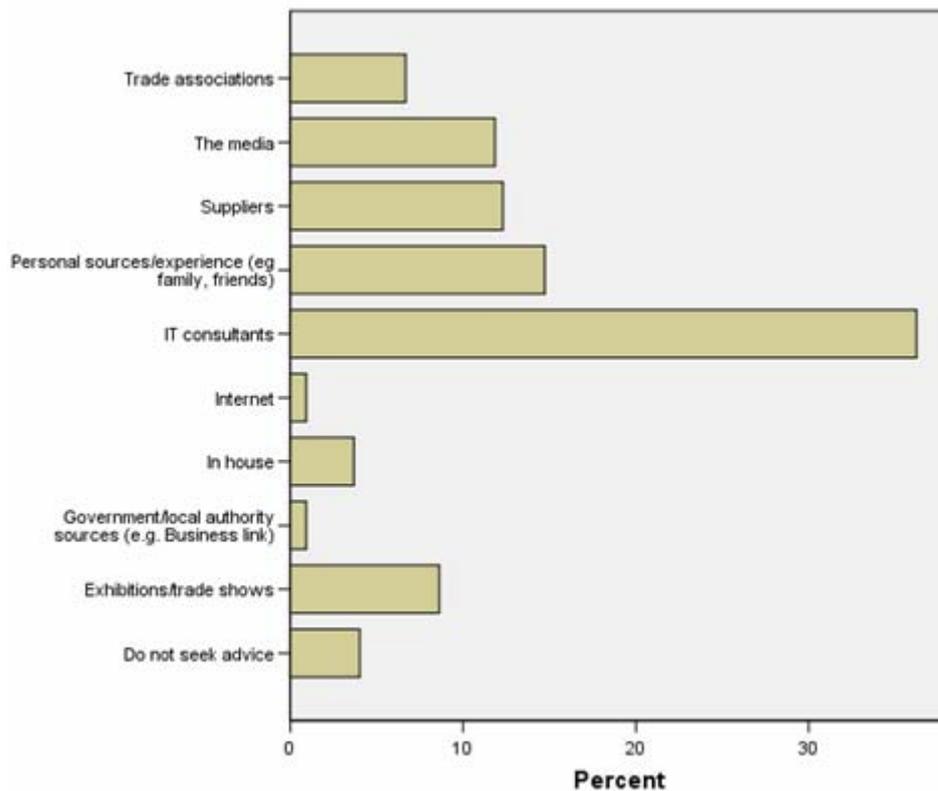
Although we could generally conclude that the effect of the internet on sales is broadly positive, what degree of impact is the internet having? The answer to this question is more disappointing. Our survey suggests that the aggregate effect in terms of the proportion of sales arising from on-line orders is quite small. At present, on-line orders as a proportion of total sales is likely to be 5% or less. Further, the number of firms in our survey enjoying this degree of on-line ordering is a minority of the total firms surveyed (about 18% of the total survey). The pattern is similar for supplies ordered on-line. Although the overall numbers of firms ordering their supplies on-line is slightly higher (20%), the data suggest that the majority of firms in our survey make very little or no use of on-line ordering in terms of their supplies.

#### 4.5 ICT advice source and choice of supplier

In this last section, we examine where the firms get advice about ICT, together with the factors affecting their choice of supplier. From Figure 9, we can see in aggregate terms that the single most popular source of advice is ICT consultants (about 38%). After that, personal sources, suppliers and the media are also

sources that the SME turn to for advice on ICT. It is also apparent that very few of our SMEs have internal sources of expertise ready to give advice (less than 5%). Given the use made of the internet to gather business intelligence discussed earlier, it is intriguing that the SMEs in our survey made such poor use of the internet as a source of information. Also, note that the trade associations appear to play a minor role as information providers in this area.

We find a similar pattern in the individual sectors although manufacturing SMEs are less likely to use personal sources for ICT advice. Instead, the media and suppliers are more likely sources of advice (27% and 26% of manufacturing SMEs respectively) than personal sources (21%). However, manufacturing and finance SMEs are proportionately more likely to have access to internal sources of expertise (8%) than SMEs in clothing and food (4%). Interestingly SMEs in the food sector are proportionately most likely to have used “official” government or local authority advice than the other sectors (5% compared to 3% in clothing and 1% in manufacturing).



**Figure 9:** Reported sources of ICT advice

Finally, having sought advice on ICT, what dictates the choice of supplier? Figure 10 shows the aggregate range of responses. Two factors appear most important, previous experience (28% of all SMEs in the survey) and cost (26%). Following this, the technical features of the product and the use of personal recommendations are also factors influencing the choice of ICT supplier. The availability of after sales service appears to be less important to our SMEs. This is intriguing given that most of the SMEs in our survey lack internal expertise.

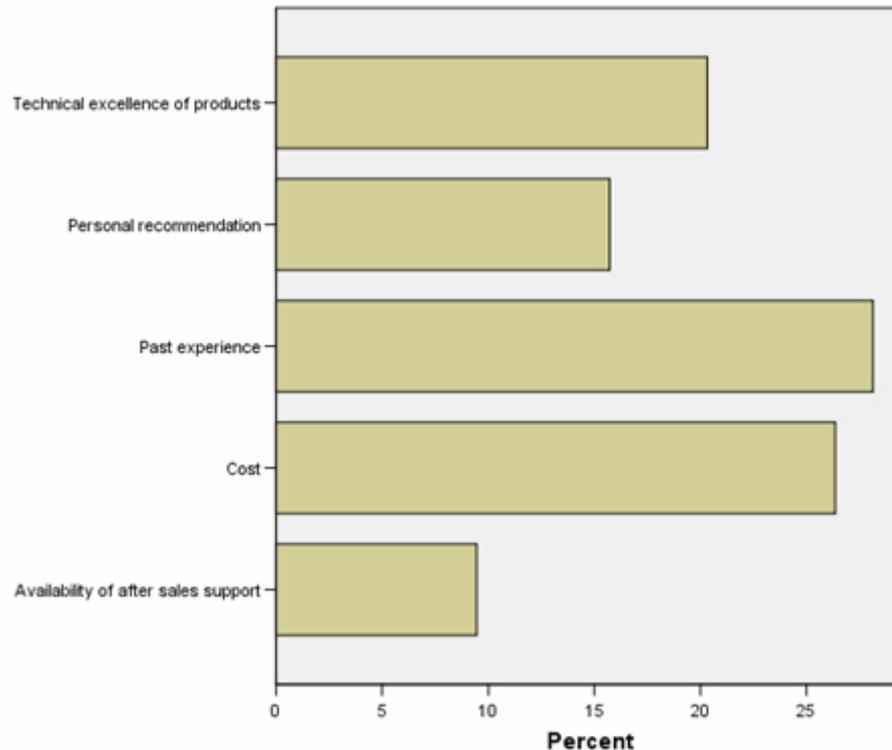


Figure 10: Reasons given for choice of ICT supplier

## 5. Discussion

There is a general reluctance by firms to engage fully with the possibilities that ICT could offer their business. SMEs in our survey remain uncertain over the business benefits that further investment in ICT could yield. Competing resource demands and a general lack of formal investment skills exacerbates this uncertainty. For many of our SMEs, basic investment appraisal techniques are either missing within the firm or are not used. SMEs in general fear losing control of their ICT spend and are distrustful of the aspirations of ICT consultants. ICT consultants are commonly perceived as part of the problem rather than as part of the solution.

Nonetheless, the overall picture that SMEs report is overwhelmingly positive. Almost all the SMEs surveyed thought that their ICT investments offered good value for money. The SMEs in our survey had experienced increased productivity and improved quality of service or product. Most of the SMEs have a website and many find that such a presence has brought in additional UK customers to their existing sales base. There is widespread computerisation of simple general tasks such as sales recording, document management and accounting operations. In general, the attitude of staff to ICT is encouraging and not perceived as a problem, and in some cases, SMEs use ICT to enhance staff satisfaction.

However, given these positive factors, contradictions exist. Most of the SMEs in our survey want to expand in some way, chiefly in increased sales; about 40% of all replies that we received indicated this as a business goal. Second most popular reply that we received indicated a desire to reduce costs – about 25% of total replies indicated this. Therefore, perhaps unsurprisingly, the most pressing plans of the firms that we surveyed focused on the bottom line issues of sales and cost. When it comes to the next most popular business plan there is then a divergence according to the sector. Both food and clothing favour expanding the number of business locations but financial and manufacture prefer increasing collaboration with trading partners and growing the number of markets that they trade in respectively. Very few firms in our survey want to retain the status quo of their existence. Few firms though have embraced the potential of the internet wholeheartedly. Most firms do not use the internet to receive customers' orders or to order on line themselves. Those that do, typically only use the internet for a small fraction of their total sales or supplies. Equally, the typical SME is likely to be a small clog in a much broader supply chain. Very few of the SMEs surveyed though are using ICT for collaboration. This may represent a lost opportunity to pool resources and increase effectiveness.

Perhaps the biggest contradiction is over the use of ICT consultants. While SMEs may view consultants as a potential problem, they are also most likely to use consultants as a source of advice. This reflects the constraints on resources that hinder the development of internal sources of expertise. Externally, the SMEs have access to the internet and use the web to gather business intelligence but this is unlikely to extend to ICT advice. More generally, SMEs in our survey are very unlikely to use "official" external sources of expertise, particularly the government, local authorities and trade associations. What is unclear is whether this reflects a lack of visibility on the part of official bodies or is an indication of the quality of advice offered.

## 6. Conclusion

Our survey suggests that SMEs have yet to grasp the full potential of information technology. There is a widespread diffusion of relatively straightforward technologies such as emails, internet access and websites but the spread of more complex technologies such as electronic data interchange is more restrained. Much of the focus of application is on securing productivity gains through the back office automation of recording and retrieval of information. Our survey has produced very little data to indicate that SMEs are also deploying ICT to enable strategic gains. Information on product and services for example is provided over the internet but very few firms actively manage consumer interest by building customer databases or offer on line ordering and payment.

SMEs are important to the UK economy, providing over 33% of GDP and over 50% of employment. They are also the source of future growth and innovation. The advent of the digital economy has made the adoption and use of ICT, including e-business, a significant issue for most SMEs. Yet, our survey suggests that many SMEs find themselves in a difficult situation. The general lack of resources means that while there may be an aggregate demand for IT service and advice, individually, the varying nature of that demand makes it uneconomical for other firms to provide a service meeting that demand. To help correct this gap in the provision of services, the government has tried to provide support with mixed success. Certainly, successive UK governments have had a strong interest in helping and supporting the SME sector. Nonetheless, successive governments and sometimes many different initiatives within the lifetime of a single government, have failed to build a common view as to the appropriate instruments and mechanisms of support for the SME community.

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