

ADOPTION OF ICTs AMONG SMALL BUSINESS: VISION VERSUS REALITY

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Abstract

It is widely recognised that small businesses with less than 100 employees make a major contribution to local and national economies. The potential for economic growth is further enhanced when businesses collaborate with each other.

The aim of this paper is to present a case study of the adoption of Information and Communication Technologies (ICTs) among small businesses within a locality of Greater Manchester, England. The paper is set within the literature of ICTs adoption. It presents a description of the 6000 small businesses situated within the locality together with the vision for economic growth that could result from greater collaboration. Simple, easy to use tools were designed specifically for the purpose and a joint local government university project put in place to encourage adoption. Adoption was facilitated by business facilitators from the local government offices and technical facilitators from the university. The reality after 18 months is that 400 firms have used and adopted the technology. The paper draws on the theory to present an initial analysis of the factors affecting adoption in this case and discusses the wider implications for adoption of ICTs among small business. The paper concludes with a description of future research.

Keywords: ICT, adoption, SME, Collaborative Information technology.

1 INTRODUCTION

It is widely recognised that small and medium enterprises (SMEs) are an important driving force of economic growth and job creation to both developed countries like the UK (Dixon *et al.*, 2002; SBS, 2004), Europe (European Commission, 2003), the USA (SBA, 2005; Headd B., 2005), and developing countries such as China (China's Economy Times, 2005). The potential for economic growth is further enhanced when businesses collaborate with each other on some venture, for example, formation of a supply chain, sharing of knowledge or resources, or joint purchasing of products and services (Zeleny, 2001; MacGregor, 2004; Todeva and Knoke, 2005; O'Donnell *et al.* 2001). Despite its importance to national economies, earlier studies (Dixon *et al.* 2002; European Commission, 2002; Taylor and Murphy, 2004a, 2004b; Weiss, 2002; MacGregor and Vrazalic, 2005) show that SMEs take up rate of ICTs are still very low, and a number of barriers to adoption have been identified.

With the vision of European 2010 "digital ecosystems" and the financial well-being of the local and national economies; local government, research institute and business have been working together for

the past few years in the attempt to support SMEs in ICT development and adoption (Dini *et al.*, 2005; European Commission, 2005). A good example of this is the eTampere programme in Finland (Helsinki, 2005).

The aim of this paper is to present a case study of the adoption and use of ICTs among SMEs within a locality of Greater Manchester, England. The paper is set within the literature of ICT and collaboration technology adoption. An initial analysis of the case study and a review of the diffusion of the innovation are presented. The study then draws the factors affecting adoption and discusses the wider implications for the adoption of ICT in SMEs based on theoretical foundations.

This paper is structured as follows:

- Section 2 gives an overview of the business in the locality, presents their IT needs, and gives a brief summary of the business portal developed.
- Section 3 discusses the adoption and uses of the Tameside Business portal.
- Section 4 analyses the factors affecting the adoption and discusses wider implications.
- Section 5 draws conclusions and outlines future work.

2 CASE STUDY: SMES IN TAMESIDE AND TAMESIDE BUSINESS PORTAL

2.1 Business in Tameside

There are currently over 6000 firms and organisations registered with Tameside Metropolitan Borough Council (TMBC) in Greater Manchester, England. The business sectors of the firms are illustrated as *Figure 1*. As shown in *Figure 1*, wholesale/retail trade and manufacturing are the predominant industries within Tameside, with a total of 1780 (29.33%) and 1015 (16.8%) firms respectively.

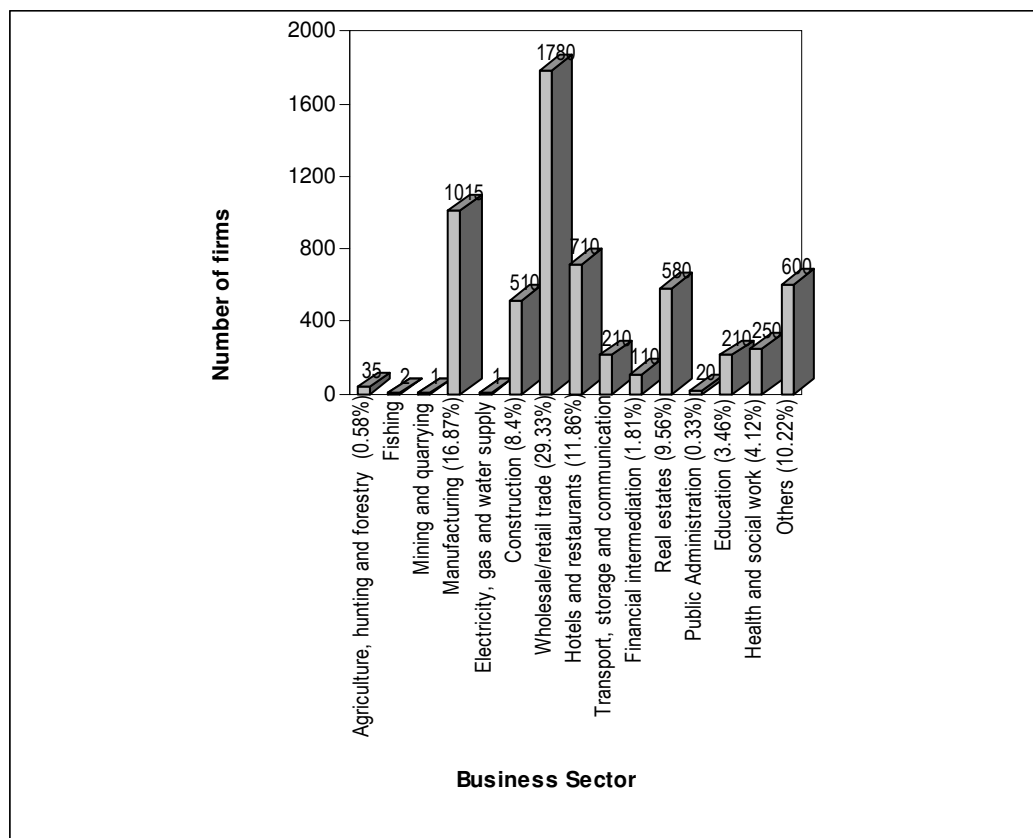


Figure 1. Tameside SMEs business sectors (source: TMBC, 2003)

The size of the SMEs in terms of number of employees is illustrated in *Figure 2*, which confirms that a significant number (60%) of the SMEs in Tameside are micro enterprises, employing fewer than 10 people.

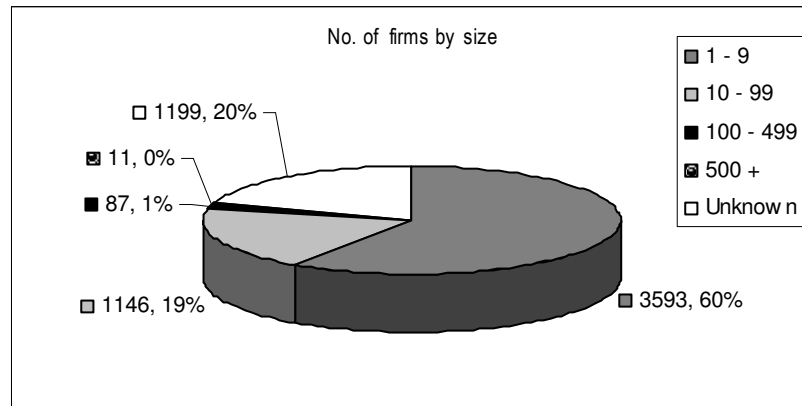


Figure 2. Size of the firms in Tameside (source: TMBC, 2003)

2.2 SME needs survey and consultation exercises

To assist with the development of Tameside Business portal, a telephone questionnaire survey¹ to assess the generic needs of firms in Tameside was carried out in the year 2002/03 by the local council. The results revealed that nearly 70% of businesses did not have a website and 80% did not have a broadband Internet connection. It was also interesting to know that over 65% showed little interest in and lack of enthusiasm for the adoption of the technology.

A qualitative individual face-to-face consultation exercise of 20 businesses in the locality was also carried out by a business facilitator from the local government in mid 2003. The survey covered more in-depth questions such as portal features and special network groups that SME thought would be useful or beneficial to them. The survey showed that different businesses have different kinds of business needs, but the majority of them thought a joint product catalogue, which offered a collective of product or service information that produced by different vendors, would be useful to them. Little interest was shown in forming SME network groups, for example, to organise a joint local/national event or to jointly bid for a much larger contract. But many of them believed that the opportunity to collaborate with other firms to share knowledge and information (e.g. EU directives or trade information) would be useful. In addition, during the consultation, businesses also expressed their concern that there was no easy way for them to find local suppliers or potential business partners if they wanted to. In the next section, the Tameside Business portal will be presented.

2.3 Tameside Business Portal²

The Tameside Business portal was set up with the vision of regional economic growth and to support SMEs in the context of ICT development and adoption. It aims to bring all business services provided by the council and other external partners into one convenient location and to provide a collaboration platform for the businesses. The initial goal was to get 10% of the SMEs registered and used the

¹ The number of SMEs involved in this survey were 5324, of which, 3770 were contacted (71%) and 1554 were unobtainable (29%). From those who were contacted, 1574 (42%) refused to participate and 2196 (58%) agreed to participate [source: www.tameside.gov.uk/etameside/survey/surveyresults.html]

² A European Regional Development Project – The portal (www.tamesidebusiness.co.uk) was developed in the School of Informatics at the University of Manchester for Tameside Metropolitan Borough Council.

portal. The portal was developed by the university based team since mid 2002 and launched on September, 2004. It was build by taking into account of findings from section 2.2. It has basic portal features such as a searchable Business Directory (contains over 6000 business information), Bulletin Boards, and advanced features such as mini-websites (firms can create their own set of pages from a choice of pre-defined pages name such as products, special offers, with full content management) and web-based collaboration tools. In the next section, the adoption and use of the business portal will be presented.

3 ADOPTION AND USE OF TAMESIDE BUSINESS PORTAL

3.1 Methods

Adoption of the business portal is facilitated by business facilitators from the local Council and technical facilitators from the university. A number of events were arranged, starting with two launch seminars in October 2004. The launch of the business portal was advertised in a local newspaper as well as newsletters sent to businesses. In addition, two seminars focussing on the collaborative tool (including a practical demonstration) were organised. The in-depth analysis of the case study was carried out through collecting data about every transaction on the portal from September 2004 to February 2006. The data is stored in a relational database to enable analysis by category and queries using Structured Query Language (SQL). The results of the adoption are described in the next section.

3.2 Results

As a result of this effort to encourage the adoption by the local council, there are currently over 400 SMEs (7%) registered and using the portal. *Figure 3* shows the trends and number of the adoption for each month since it was first launched. However, feedback is mixed as shown in *Figure 4*.

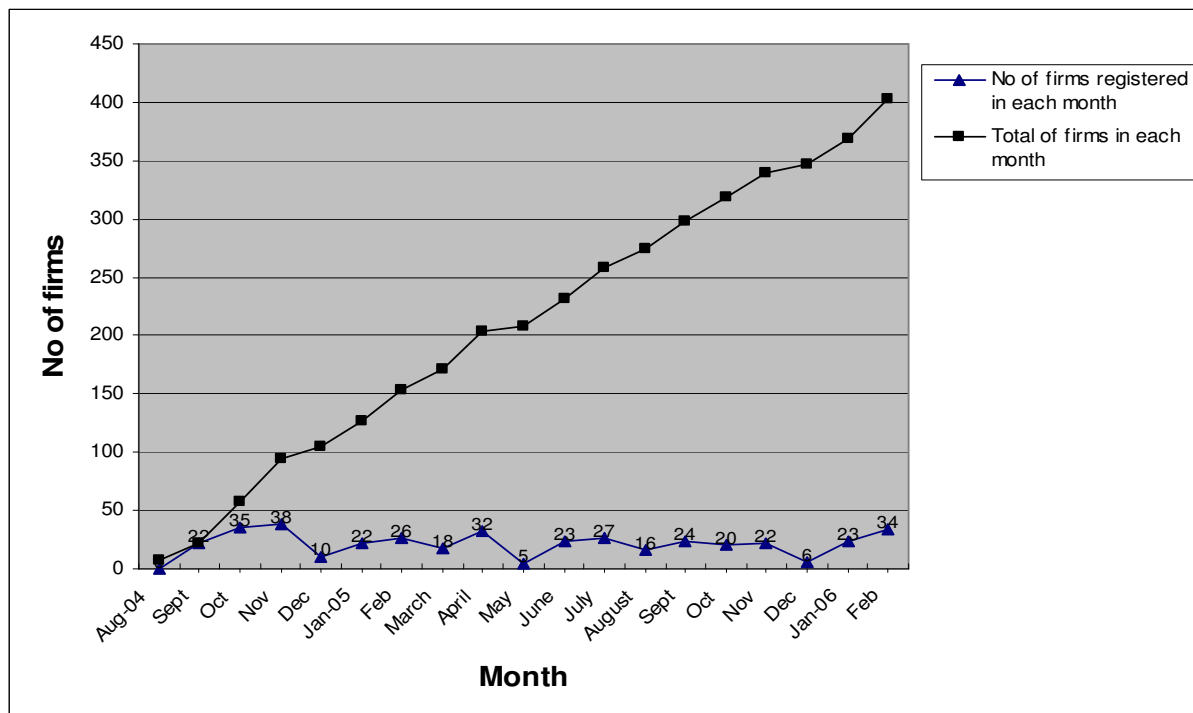
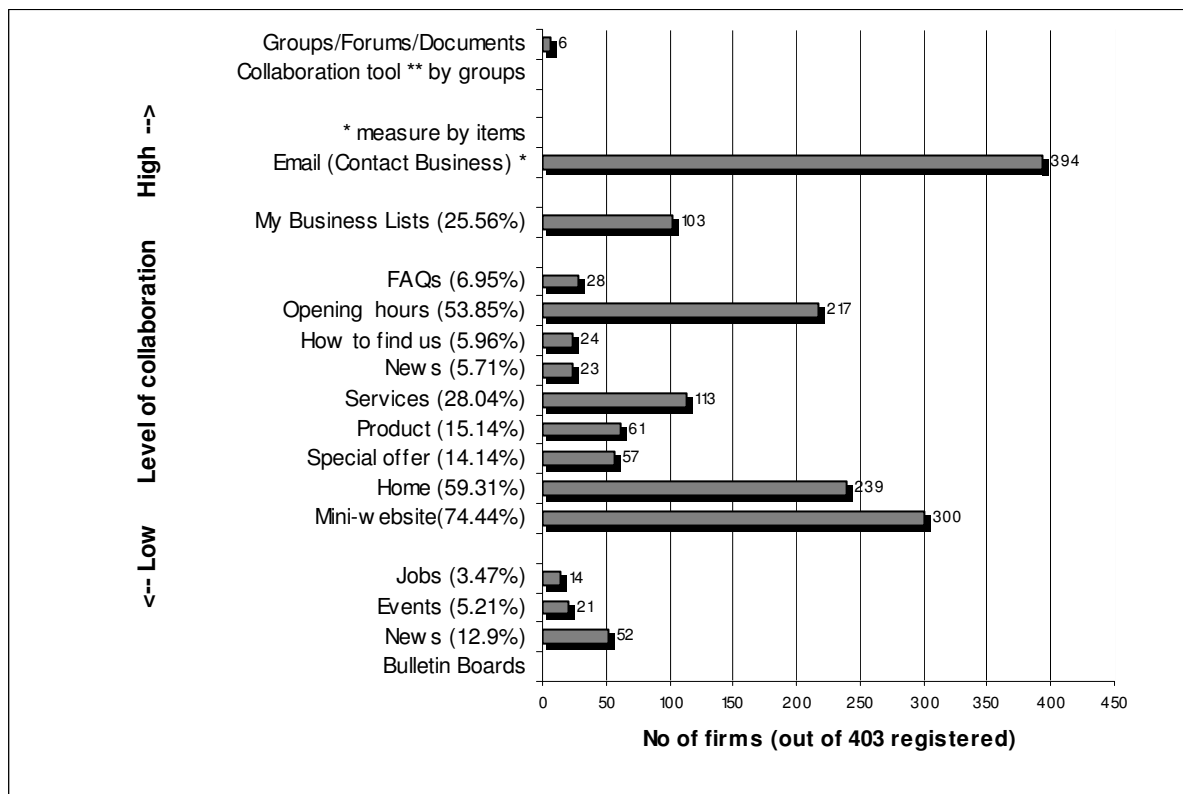


Figure 3. Adoption of Tameside business portal – from September 2004 to February 2006 (source: www.tamesidebusines.co.uk)

As shown in *Figure 4*, mini-websites have proved relatively popular and many businesses have invested significant resources into it by adding logo, pictures and content. Within each individual page of mini-website, the 'Home' and 'Opening Hours' are the two widely adopted pages. Mini-websites had originally been intended for firms without a web presence, but it turned out that approximately 60% of the firms who have adopted this feature already have their own website. As for the Bulletin Boards, nearly 13% of the businesses have used the facility to post a news item. It is also noted that 103 (25%) firms have used the "My lists" to organise their businesses lists. So far, email has been widely adopted by visitors and business members as a means of contact and collaboration among firms. The collaboration tool has six cases of adoption, that is, six private or semi-open collaboration groups, but on the whole, receiving little attention from Tameside SMEs.



Note: * measure by items (i.e. 394 items) **measure by groups (i.e. 6 groups)

Figure 4. The usage of the portal applications (source: www.tamesidebusiness.co.uk)

4 FACTORS AFFECTING SUCCESS – VISION VERSUS REALITY

The Tameside project was set up with the vision of regional economy development and growth. The aims to support SMEs and to facilitate the adoption of ICT within the region, as well as to provide an integrated platform to encourage SME networks. The reality after 18 months shows that even with low investment costs (e.g Internet connection fee and personal computer), free, simple and easy to use web-based tools, with support and training from both the local council and university, SMEs in the locality are still slow and reluctant to take up the technology.

4.1 Factors affecting adoption

A number of studies (Roger, 1995; Mustonen-Ollila and Lyytinen, 2003; Koh and Maguire, 2004; Wong and Aspinwall, 2005; Bejwa *et al.*, 2005; Fillies *et al.*, 2004; Martin and Matly, 2003; Eastin, 2002; MacGregor, 2004; Brousseau and Chaves, 2005; Aguila-Obra and Padilla-Meléndez, 2006; Dixon *et al.* 2002; Xu and Quaddus, 2004) have discussed the factors that affect the adoption of ICTs and innovation technology. Based on the findings from literature in this area and in-depth analysis of the case study, the factors affecting the adoption of the business portal can be divided into people and technology categories as follows.

4.1.1 "People" and firm/organisational factors

- **Lack of interest / lack of awareness**
Studies (Koh and Maguire, 2004; Dixon *et al.* 2002; Taylor and Murphy, 2004) show that SMEs are generally unaware of the potential of ICT to enhance their business operation. Statistics (*see www.tameside.gov.uk/etameside/survey/surveyresults.html*) showed that 76% of firms showed no interest in advertising their business in the Tameside Business Portal. 80% of them showed no interest in funding provided by the local Council either on an improvement of an existing website or a start-up website. In addition, over 70% of SMEs were unaware of the Tameside Passport to Learning initiative, showing little interest on receiving information regarding future IT training courses from the council. The collaboration tool (i.e Tameside Business forum) was introduced to each SME at registration, but evidence showed (*see section 3.2*) that they had little interest in adopting the tool. Residential profiles of towns in Tameside (*Table 1*) also revealed that a large part of residents in the region show little interest in current affairs.
- **Education background**
Studies in (MacGregor, 2004; Xu and Quaddus, 2004) indicate that CEO education level is significantly associated with the decision for technology adoption. This study found that the majority of the people living in the locality have a low education-level (*Table 1*), and it is reasonable assume that this includes CEOs.

	ACORN (1-57)	Family Income	Interest in current affairs	Educated – to degree
Ashton	42	Low	Low	Low
Audenshaw	41	Low	Low	Low
Denton	42	Low	Low	Low
Droylsden	30	Medium	Low	Low
Dunkinfield	48	Very low	Very low	Very low
Longdendale	29	Medium	Medium	Medium
Mossley	25	Medium	Medium	High
Stalybridge	43	Low	Medium	Low
Hyde	42	Low	Low	Low

Table 1. Residential profiles of towns in Tameside based on ACORN (a classification of residential neighbourhoods) by using a central postcode of each town (source: www.upmystreet.com)

- **Prior use of ICTs**
SMEs who have prior use the Internet technology for the same activity are more likely to adopt the similar technology again (Eastin, 2002; MacGregor 2004). This study shows that nearly 60% (*see section 3.2*) of the SMEs who have created a mini-website on the portal already have their own websites.
- **Lack of resources and IT skills**
Studies (Taylor and Murphy, 2004; Dixon *et al.* 2002; European Commission, 2002; Fillis *et al.* 2004) show that lack of resources and IT skills are considered barriers of SMEs ICT take up.

Statistics showed that 60% (*see section 2.1*) of firms in Tameside are micro businesses, with only handful of staff and many of them are a single owner/manager; therefore, they usually do not have the time to produce information such as content for the website. In our observation, we did find some of the firms' mini-websites were actually created and maintained by third party web designer.

- Size of the firm
Findings from MacGregor (2004) suggests that SMEs with fewer than 10 employees were less likely to adopt ICTs than larger SMEs. Statistics showed that 60% (*see section 2.1*) of the SMEs in Tameside fall into this group. However, Bajwa *et al.* (2005) suggest that size may not be a significant predictor of adoption of some inexpensive collaboration tools like email and web-based tools. In fact, statistics showed (*see section 3.2*) that email has been highly utilised by business and customer as a means of communication.
- Business sector
Study (MacGregor, 2004) shows that service-oriented firms were more likely to adopt ICTs than manufacturing or retail-based firms. Figures show that approximately 50% (*see section 2.1*) of firms in Tameside belong to retail/wholesale and manufacturing sectors. In addition, evidence shows that majority of SMEs who have used and adopted the portal also tend to be service-oriented business.
- Lack of perceived need
It is observed that there is a general lack of perceived need to collaborate amongst the business in the locality.
- E-facilitator/e-manager
Martin and Matlay (2003) pointed out that the presence of 'e-manager' in a firm is an important factor for the use of e-technology. In this case study, among the 6 collaboration groups, the groups that seem to work better have a paid facilitator whose job is to actually administer the group and to post items of interest to the members.

4.1.2 "Technology" and environmental factors

- Innovation factors
Studies in (Roger 1995, Mustonen-Ollila and Lyytinen, 2003; Koh and Maguire) suggest that innovation factors such as visibility and trialability are notably associated with technology adoption. The collaborative platform is regarded as a revolutionary e-business model and the degree of innovation is higher than other e-business models such as e-commerce and e-mail (Vézina *et al.*, 2003). Findings from Koh and Maguire (2004) suggest that small businesses are less likely to adopt unproven technology and more likely to take on software or applications that have been thoroughly tested by other organisations.
- Telecommunication infrastructure
Earlier statistics (2002/3) (*see section 2.2*) showed that over 80% of the SMEs situated in the locality did not have access to broadband connection. This could stop them from using the portal, but with the advancement of UK telecommunication infrastructure and services for the past years, this might not be a significant factor anymore.
- Location
Bajwa *et al.* (2005) indicate that location proximity of trading partners reduces the needs for sophisticated collaboration information technology (CIT) adoption and use. This could be the reason why the collaborative tool in this study received little attention from SMEs.

4.2 Wider implications of adoption

The case study utilised the emerging e-business technology (i.e Web Portal) which provided an integrated and collaborative platform for the 6000 firms. By doing so, the aggregation of a wide

variety of information such as services and products produced by different SMEs can be achieved; the sharing of information/knowledge among businesses thus becomes effortless (Bagchi *et al.*, 2000). In addition, through clustering SMEs into one location, SMEs can obtain the advantage of “bigness” while remaining small (Terziovski, 2003). This has proven to be a worthwhile approach as the portal has been given a high ranking by various search engines and evidence shows that the portal has attracted a significant number of visitors. Fundamentally, these factors have become the driving force for SMEs using and adopting the ICTs, with the incentive for the majority of SMEs registered to use the portal being the mini-websites. Therefore the focus on adding more features to the mini-websites as well as further promotion of the portal might encourage and increase rates of adoption.

5 CONCLUSIONS AND FUTURE WORK

The paper confirms that many of the factors affecting ICT adoption reported in the literature are in fact true for this case study. Despite the best effort of Europe to create the vision of a ‘digital ecosystem’ based on regional economies to advancing SMEs towards the Lisbon objectives of ‘Information Society’ and ‘Knowledge Economy’, greater attention should be paid to the reality. Many of the factors affecting adoption as described in Section 4.1 could have been predicted prior to the commencement of the project. On a more positive note 400 (7%) SMEs are now actively using the portal, whilst 6 groups have been formed and are actively collaborating using the portal.

Eighteen months into the project, the level of adoption is still increasing. It may be that a sub-regional economy with the characteristics of Tameside takes longer to adopt ICT than one with more favourable characteristics (i.e. better education levels, interest in current affairs, or higher income).

Conversely, the Tameside Business portal has provided us a positive insight of how government and agencies could help the businesses in the region to enhance their national and global visibility through the Internet (e.g. through portal technology and features such as mini websites). Evidence shows that it has attracted an average of 150 visitors per day, more sales and businesses could perhaps be created.

Further in-depth survey to identify the reasons for those who have negative attitudes towards ICT would be beneficial to this study. It is also interesting to ascertain if there is any impact to individual business by not participating to this e-digital economy and the negative impact that ICT brings to society.

In contrast, it would be worthwhile to conduct a survey of those who have adopted the technology and to know if they have benefited from the adoption and vice versa, and to provide suggestions for improvement. Finally, comparison of SMEs ICTs adoption in other localities in terms of regional characteristics would also be beneficial to both practitioners and academia.

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