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DIFFUSION THEORY AND THE DIGITAL DIVIDE IN E-SERVICES: AN EMPIRICAL INVESTIGATION OF TWO LOCAL AREAS IN THE UK

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Abstract

The aim of this paper is to analyse the translation of the national policies at local levels in order to draw some conclusions about the impact of the strategies upon an equitable distribution of an e-society in terms of ethnicity and disadvantaged groups, such as the elderly and disabled. Three data gathering activities were conducted in the UK local areas of Hillingdon and Medway: a survey that included 620 completed responses from the citizens; focus group discussions in both locales and interviews with the local government managers responsible for the local e-government initiatives. To ensure a high response rate from the ethnic groups and disabled citizens the snowball data gathering strategy was employed. The findings of this study illustrate that by employing the diffusion theory of King et al, the local government policies are reducing the digital divide. However, the danger does exist that in pursuit of providing an equitable distribution of an e-society a novel and diverse form of digital divide, a rural and urban and diverse ethnic groups divide could occur. This research should offer a substantial contribution to various stakeholders including government agencies, management consulting firms, Internet Service Providers and IT organisations who may want to identify areas where e-government services can still be improved. This will also assist government agencies to understand the problem of low adoption and formulate a strategy to promote awareness and diffusion.

Keywords: E-Services, Diffusion, Digital Divide

1 INTRODUCTION

Global governments are becoming aware of the capabilities of Information and Communication Technologies (ICTs), and developing strategies that will offer online government products and services to all areas of the country (NARM, 2002). As the potential of a clear link between the use of ICTs and economic growth are becoming apparent numerous organisations and governments are being urged to invest profoundly into it (OECD, 2004). Novel forms of ICTs, such as broadband are being implemented in order to provide e-services. Research that examines the interaction and the connecting of governments to the members of the public is known as e-services (Heeks, 2004). Contrastingly, the utilisation of ICTs to improve the activities of the public sector organisations is referred to as E-government (ibid). However, the provision of e-services is also leading to the equitable distribution of novel ICTs to become an issue of concern (Land et al, 2004). The apprehensions that are emerging are being attributed to social exclusions that could arise due to the inequitable dissemination, which in turn could lead to citizens with lower incomes, educational levels or locations within the country not having access to information technology; thereby resulting in a novel form of *digital divide*. Most early research on the digital divide focused upon recording the presence or absence, closure or widening of gaps in access and usage (Mason and Hacker, 2003). However, as governments become increasingly attentive to the needs of the citizens and strive to offer online products and services, the diffusion of ICTs and its impacts upon an equitable distribution into society continues afoot. Therefore, it has become increasingly imperative that citizens should participate in the information society, as failure to do so will result in potential marginalisation in social, economic and political terms (Brants and Frissen, 2003).

In this paper the application and impact of government policies at local levels is examined by conducting two case studies: one in the London borough of Hillingdon and the other, Medway; two large United Kingdon (UK) local locales. Our aim is to analyse the translation of the national policies at a local level in order to draw some conclusions about the impact of e-services that should result in an equitable distribution of an e-society. In the instance of this paper e-society refers to the development of communities within the boroughs of Hillingdon and Medway. Further, for the purpose of this study, it is imperative to distinguish and determine what constitutes an individual from an ethnic group. According to Fulcher and Scott (2003), ethnic groups are "defined by their sense of sharing a distinct culture that can be traced back to the historical or territorial origins of a group". Classifying individuals into ethnic groups can be difficult (ONS, 2001); however this study will use the Office of National Statistic guidelines for classifying ethnic groups.

As governments around the globe are becoming technically savvy the issues of the *digital divide* are becoming important. Subsequently we intend to examine the possibilities of generalizing our findings to other geographical and or cultural settings. We believe that our analysis will be useful to policy makers seeking to promote the use of online products and services to communities in a country in an equitable manner. Researchers in the area of technology diffusion can also benefit by getting insights of the application of ICT policies at local levels.

1.1 EXAMINING THE DIGITAL DIVIDE AND E-GOVERNMENT IN THE UK

To encourage e-services adoption amongst citizens, the UK Government has pioneered projects using UK online centres, Learn Direct, and Wired up Communities, as well as valuable local initiatives (Jones and Crowe, 2001, pp vii). Additionally, the Government has created Directgov (www.direct.gov.uk), an online portal that allows citizens to access services offered by Government from a centralised location. By failing to engage citizens in the e-government process there is a risk of alienating and excluding the deprived and vulnerable from the information society. As Fang (2002

cited in Weerakkoddy et al, 2004) identified, "Governments often interact more with the elderly, poor, language limited and less educated people, a group who are less likely to have access to the Internet".

In the UK, all government departments, agencies and organisations need to ensure that they meet the government's pledge to place all public services online by the end of 2005 (Beynon-Davies, 2004; Gilbert et al, 2004). However, in 2004, only 52% (12.6 million) of UK households could access the Internet at home, compared to just 9% (2.2 million) in 1998 (ONS, 2005). The proportion of adults using the Internet is highest amongst adults living in London and the South East (64%) with the North East of England (43%) having the lowest (ONS, 2004). In the UK, 35% of adults have never used the Internet, and of these, 44% stated they did not want to use, or had no need or interest in using the Internet, with 42% of these people having no Internet connection (ONS, 2005).

A key principle of the UK e-government initiative is to socially include all citizens into the modernisation process. This includes members of society who are poor, disabled, and unemployed, ethnic minority groups, young, old and the educationally and culturally deprived (Hicken, 2004; Crown, 2004). The UK is a multi-cultural society with ethnic minority groups constituting approximately 8% (4.6 million people) of the total UK population (Census, 2001). In terms of the digital divide a Department of Trade and Industry (DTI) report found that 35% of adults in the UK, mainly from disadvantaged backgrounds, felt "concerned" and "alienated" by increasing use of ICT in society (Hendry, 2000). Conversely, in a BBC news article (2003) it was found that Asian and black families with computers are inclined to use it for work and education rather than to access home shopping and E-Government services. It is suggested that black people living in deprived areas of the UK have less access to home computers than their Asian neighbours, with 42% of Asian families owning computer compared with 31% of Black families and 37% of White families. Despite Asian families having the highest proportion of computer access in the UK, they are less likely to use the Internet. White families are more likely to use their computers to access e-government services online, with 34% of White families access e-government services online compared to 26% of Black families and 20% of Asian families (ibid).

At present a majority of e-government web sites are developed in English. However, as the UK is a multi-cultural society, there is a possibility that many of its citizens may not be English literate or fluent English speakers. Therefore, local councils and government departments, agencies and organisations all have a responsibility to socially include and provide e-government services to citizens (Teicher, et al, 2002). However, according to research carried out by the Institute for Public Policy Research (2002), 86% of local councils have no access strategy for members from ethnic minority communities. Citizens, who are computer illiterate, over retirement age, or incapable of reading the information in the language provided, may have problems accessing E-government services, as they do not possess the skills needed to access available information or use the required technology (Becker, 2005). In an experiment conducted by Hargittai (2000 cited in Warschauer, 2004), participants from disadvantaged groups discovered multiple problems using the Internet including difficulties entering valid search entries because of spelling mistakes and infrequent use of search engines. Instead the participants used only the links and functions provided directly by the Internet Service Providers (Warshauer, 2004).

Additionally, as e-government services are primarily web based services, older users could face cognitive, visual or physical problems when trying to access information using this medium (Becker, 2005). Further, adults over the age of 60 usually experience a decrease in motor coordination, hence, making it increasing difficult for them to use web sites to retrieve information (ibid). For example, older users may find it difficult to coordinate on screen mouse activity or scroll down a Web page (Coulson, 2000, cited in Becker, 2005). Evidence from many surveys (National Statistics, 2002; KPMG Consulting, 2002) has found that older citizens in the UK are much less likely to use e-services than other age groups. In September 2002 only 17% of those aged 65 or over had used the Internet compared to 94% of those aged 16 to 24 years and 47% of those aged 55 to 64 years (National

Statistics, 2002). The point being emphasised here is that disability is not limited to being physical or mental in nature, and people can be disabled due to ethnicity, age or even literacy. The aforementioned problems can exist within any given country, and so affect those of all ethnic groups. However, if e-services are to fulfill their aims, potential and become diffused within society, the support and service provided to ethnic minority groups by local and national government needs to be improved. Without this support, the digital divide separating ethnic minority groups from the rest of society is likely to increase.

In the next section we describe the mechanisms used for the diffusion of new technologies such as broadband emphasising on the awareness creation mechanisms for citizens. In section 3 we present the research methodology pursued in this research. Section 4 offers the results of the surveys, interviews and focus groups that occurred in Hillingdon and Medway. In section 5 we analyse the local government's policy on the matter. Finally we draw some conclusions about the future of broadband and we offer some recommendation for best practices for its diffusion.

2 DIFFUSION MECHANISMS FOR TECHNOLOGY ADOPTION

According to Rogers (2003), "*diffusion* is the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). Roger's diffusion of innovation theory (DOI) has gained wide popularity in the IT field, with studies describing diffusion in terms of an S-shaped curve where early users adopt the innovation and then pass their knowledge to the later adopters.

Rogers also demonstrates that most change agents (entities that influence potential adopters) concentrate their efforts on creating awareness-knowledge. He suggests that change agents should pay their most distinctive and important role by concentrating on how-to knowledge, which is more essential for adopters in their trial of an innovation. There are several methods that can be used in that stage in order to help diffusers working at a national or local level to create awareness about the technology under consideration. These include awareness campaigns, road shows, seminars and exhibitions (Papazafeiropoulou *et al.*, 2001).

Roger's theory is sought to provide the reasoning behind individual or collective adoption of an innovation, but has been criticized as not taking into consideration the particularities of complex information technologies (Lyytinen and Damsgaard, 2001). Other models related to the study of innovation diffusion are divided into interpretive and knowledge based (Beynon-Davies and Williams, 2003). These models are different in that they emphasise the social construction of technology under investigation, focusing on the impact that specific groups of stakeholders, such as professional associations have on the innovation decision process. In this paper we use the traditional as well as contemporary models of the diffusion of innovation in order to examine the first stages of the innovation decision process in the case of broadband that happens to be a relatively new technology (particularly the contexts of the household and small to medium sized enterprises) that policy makers seek to promote to the public. We use as our basis the diffusion of innovations theory as defined by Rogers (2003). However, we take into consideration the critics of his work and enrich his theory with other studies of innovation diffusion, particularly those related to the diffusion of information technology innovations.

Bearing the aforementioned reasoning in mind, this research sought to utilise King et al's (1994) framework. This is due to King et al's (1994) framework focusing upon the role of government and other such government agencies and bodies, which is a group that is applicable to and imperative for this research. King et al (1994) observe that although the objectives of IT-related programmatic statements issued by various government agents are clear, the mechanisms used for the mobilisation of government leadership appear to be inefficient. They argue that these difficulties in the application IT

diffusion polices are related to inefficient analysis of the role of institutions involved in the IT diffusion process. For their arguments, they use the demand-pull and supply push theory in government intervention for technology diffusion. Supply push force comes from the production of the innovative product or process itself. Demand pull force arises from the willingness of potential users to use the innovation. They also argue that governments can either be *influential* or *regulatory*. *Influence* is the persuasive power that an institution exerts over the practices, rules and belief systems of those under its sway. *Regulation* is the direct or indirect intervention in behavior of those under the institution's influence. Combining the two modes of intervention, *influential and regulatory* with the two types of driving forces, *supply push and demand pull*, they then defined six main institutional actions: *knowledge building, knowledge deployment, subsidy, mobilisation, standard setting* and *innovation directive.*

For the purpose of this research two of the institutional actions related to awareness creation; namely, knowledge deployment and mobilisation are utilised. The objective of the knowledge deployment strategy is to stimulate the dissemination of new knowledge. Its most obvious form is the provision of education to the population either through the official educational system (e.g. schools, universities) or through temporary training of the working force. Mobilisation is the encouragement of decentralised actors and organisations to think in a positive way about the innovation. The main institutional instruments for mobilization are promotional and awareness campaigns. These two actions emerged as being prevalent and influential when examining the issue of the digital divide. For example, in the rural areas, government agencies and bodies are encouraging businesses to adopt ICTs; whilst in the urban areas local government initiatives in public libraries that are accessed by the citizens are encouraging citizens to utilise and become familiar to ICTs; thereby forming a positive opinion of ICTs.

The next section presents the methodology that was used for collecting and analysing the data from a survey, focus group and interview. The empirical study had an exploratory nature and aimed at establishing an insight of the implementation of national e-government policies on a local level and how this has impacted the digital divide.

3 RESEARCH METHOD

As e-services are still growing within the UK this research was focused on determining its applicability and development; therefore, an exploratory approach rather than in-depth study was employed. For this, a quantitative and qualitative approach that involved using the survey method and interviews were used. The primary data was obtained by distributing hard copy questionnaires to 1000 people in both vicinities, of which 620 were returned completely answered — 355 in Medway and 265 in Hillingdon. The questions to the interview and questionnaire were formed after the literature review of the main issues regarding equity in e-government and the IS areas. The questions were divided into two broad categories: (1) Multiple choice questions addressing the social attributes (demographic variables) including age, gender, education, and income; and (2) Likert scale questions that were designed to address the issues related to e-services adoption within the identified groups.

To evaluate the appropriateness of the questionnaire it was initially sent to a small number of experts within the local authorities and academia. The feedback responses from the experts led to minor changes within the questionnaire. To understand factors such as ethnicity and disability, it was important to ensure an adequate response rate was obtained from the citizens who only form a small minority of the total population. A simple random sampling approach, e.g. sending questionnaires to 1000 households was therefore inappropriate. Instead the snowball sampling strategy was employed. For this, initially a random sample of individuals was contacted in shopping malls and libraries. The questionnaires were completed on site or self addressed envelopes were distributed. The participants who co-operated were then requested to provide addresses of other ethnic minority or disadvantaged

groups so that questionnaires could be sent using the postal mail system. Alongside, two focus groups were formed within the local libraries of the two areas. Participants were asked to join the focus groups by offering a cash incentive of 20 pounds. There were five members in the Medway group and six in Hillingdon. A total of three interviews were held with the two local e-government programme managers and were used to determine whether the opinions expressed by the citizens were also synonymous to the local authorities. This holistic process then allowed the presence of rigour, verification and validation (data triangulation) to this research. To analyse the quantitative findings, a statistical software package Excel was used. For the qualitative aspect the process of coding by forming themes was employed.

4 E-SERVICE INTIATIVES IN MEDWAY AND HILLINGDON

4.1 Archival Documentation

From the archival documentation and references from the internet the following information regarding the two locales was obtained. The London Borough of Hillingdon was formed in 1965 and is London's second largest unitary borough covering 42 square miles. It covers the north-west corner of the former county of Middlesex and is the westernmost London borough. The borough also includes Heathrow airport and Northolt aerodrome. From the Census 2001 statistics it was found that the resident population of Hillingdon was 243,006, of which 48% were male and 52% female. The average age of the population was 36.9 years in comparison to 38.6 years in England and Wales (Census 2001).

Medway Council was inaugurated on 1 April 1998 and is situated in Kent in the South East of England just 45 minutes from the centre of London, the Channel Tunnel and ports. The resident population of Medway was 249,488 of which 49 % were male and 51 % were female. The average age was 36, compared with an average age of 38.6 years for England and Wales (ibid). The ethnic composition of Medway and Hillingdon are shown in Table 1 below.

Percentage of resident population in ethnic groups:	Medway	Hillingdon
White	94.6	79.1
Asian or Asian British	3.0	14.4
Black or Black British	1.8	4.2
Chinese or Other	0.7	2.4

Table 1: Ethnicity in Hillingdon and Medway. Source: Census, 2001

4.2 Interviews with E-Government Programme Managers

The following discussion emerged after interviews with the e-government programme managers of the two local authorities and secondary sources were referred to. Medway and Hillingdon councils have made efforts to socially include disabled citizens. The councils have re-designed their websites to comply with the World Wide Web Consortium (W3C) guidelines to improve accessibility and usability. Specifically, if the websites of both local authorities are examined it can be seen that in the instance of Medway, there is a link at the top of the webpage that offers information on accessibility to the website. Further investigations of the websites revealed that there are facilities for e-services for the disabled in the form of amongst many, contrasts, text enlarging and Braille. Contrastingly, Hillingdon also offers assistance to the disabled by referring to the link 'Assisting with text size'. Further interviews with the e-programme managers in Hillingdon and Medway provided an insight into the local authorities' efforts to socially include citizens, which included aiming to have public access points placed on the ground floor or in buildings with an elevator (lift). Additionally, the kiosks were designed so that they are positioned low for wheelchairs and that the 'dots' are on the right keys,

the use of large keys, the size of the text could be changed and colours were employed to accommodate the colour blind users. In an attempt to ensure that all the citizens, regardless of ethnicity and disability can access the Internet in a location that is most familiar to them, Hillingdon offers the 'People's Network' service within public libraries, which is funded partly by the UK Lottery fund. For this libraries offer longer opening times and free training to users. Additionally, the libraries have been designed in a manner such that the disabled can obtain access and the monitors are equipped with software that offers assistance to those who require it.

Both councils have also attempted to ensure that the e-illiterate citizens are not ignored or forgotten. Kiosks installed by Medway council have been designed with a 'help' facility that is provided to assist kiosks users who have no prior computer experience. Medway council's staff has been trained to produce documents in simple, non technical English to assist those who have difficultly using technology or reading English. This includes media published on the Internet and the 'help' facility provided with the kiosk. This is a situation very similar to Hillingdon. As the e-illiterate may be unable to use the Internet, the councils have developed the use of telephone services. Hillingdon council conducted their own research before beginning the E-service initiatives and they discovered that the majority to their customers wish to contact staff via the telephone. Therefore, Hillingdon council has invested heavily in new customer contact centers.

For the older citizens e-services implementation Medway and Hillingdon councils had allocated funds in place. Medway allocated £2.8 million in 2002 for the improvement of e-services. Since then strategies have emerged in the form of community centers and Indian temples being access points. This way, if an elderly citizen required assistance, then this could be obtained in a place of familiarity and trust. Also, Medway council stated that if an elderly or any other citizen with difficulties required assistance from the council, such as when completing a web-based form, the citizen could visit the Council offices and assistance could be provided. Hillingdon allocated upto £6 million to improving services to the elderly and disabled groups. To ensure that the funds will be utilised in the way that they were meant to be, a champion (a councilor of the local authority) for the elderly and disabled groups has been appointed. The council has already set aside £250,000 in the current financial year for major projects to assist older people and those with disabilities.

With regards to e-services for the ethnic minorities, both councils pursued similar strategies. At present, the councils provide a translation services for citizens who can not speak fluent English. However, Medway council is planning to implement a web translation device that will assist non English speakers use the council website. Additionally, Medway council is planning to implement e-Forms in indigenous languages to assist the English illiterate, which will enable the citizens who cannot utilise the e-forms the ability to submit the forms back in the language of their choice.

4.3 Survey

Whereas the previous section examined the policy aspects of local government, a survey was conducted to obtain an insight of how members of the ethnic groups and disabled residents of the two locales interacted with the internet and e-services. The initial findings from the survey are presented in Table 2. It illustrates the association of internet access between urban and rural areas in Hillingdon and Medway. The combined number of the two sites shows that internet access in the urban area is 85%, which is, as a Chi-square test shows, significantly (χ^2 (1, N = 620) = 62.79, $p < 0.001$) higher than the 54% access rate in rural areas. This shows a clear divide between internet accessibility when it comes to location for the people in the survey. Therefore, although the local governments are attempting to ensure that there is equal accessibility to the internet, the results obtained by this finding illustrate that the urban area dwellers have more accessibility than the rural ones; therefore, this aim is not yet being fulfilled. Further it can be concluded that although the local government is attempting to eliminate the digital divide it is not obtaining it.

	Urban		Rural	
Site	Yes	No	Yes	No
Medway	242 (89%)	30 (11%)	49 (59%)	34 (41%)
Hillingdon	171 (81%)	41 (19%)	24 (45%)	29 (55%)
Both sites	413 (85%)	71 (15%)	73 (54%)	63 (46%)

Table 2: Home Internet access in the urban and rural areas

The following analysis focused on internet access for disabled citizens. Table 3 presents the responses on the question determining whether people with one or more disability(ies) have access to the Internet. Overall the number seems encouraging with regard to the earlier reported 52% of UK households that could access the Internet from home in 2004 (ONS, 2005). However, there was a low home Internet access rate to respondents with hearing problems (17%), which differed to the responses of other disabilities. Unfortunately, since only 6 people with hearing problems were included in this sample, this result is inconclusive and suggests that more data is needed to establish a better understanding of internet access for this group of citizens.

Disability	Yes	No
Learning disability	13 (76%)	4 (24%)
Difficulty using hands	0 (0%)	0 (0%)
Hearing problems	1 (17%)	5 (83%)
Visual problems	202 (81%)	46 (19%)
Physical difficulty	4 (50%)	4 (50%)

Table 3: Home Internet access of disabled respondents

An interesting revelation was that ethnicity had a significant effect (χ^2 (3, N = 620) = 52.79, $p < 0.001$) on home Internet access. Table 4 shows that Internet access of the Black or Black British community was 47%, which is low compared to that of the other ethnic groups. This finding however seems to correspond with reports (BBC 2003) that Black people living in deprived areas of the UK have less access to home computers than their Asian neighbours. Therefore it seems to indicate a divide also between ethnic groups when it comes to Internet access.

Ethnic origin	Yes	No
With (White British, White Irish, Other White)	191 (85%)	34 (15%)
Asian or British Asian (Indian, Pakistani, Bangladeshi, Other Asian)	176 (75%)	60 (25%)
Black or Black British (Caribbean, African, Other Black)	50 (47%)	56 (53%)
Chinese or Other Ethnic groups (Chinese, Other ethnic groups)	38 (72%)	15 (28%)
Total	455 (73%)	165 (27%)

Table 4: Home Internet access of Ethnic origin

The respondents were also asked whether they knew what e-services were and what they involved, before completing the questionnaire. Of the Medway responses, 37 out of 318 (10%) answered yes, which was significantly χ^2 (1, N = 620) = 9.70, $p < 0.01$) lower than the Hillingdon response; which was 51 out of the 265 (19%). The question following that was about the actual use of e-services. Again a similar trend between the two locations was observed. Of the Medway respondents, 25 out of 355 (7%) answered yes, compared to 38 out of 265 (14%) for the responses from Hillingdon. Yet again a Chi-square test indicated that this was a significant difference (χ^2 (1, N = 620) = 8.85, $p < 0.01$).

Although these numbers are low, the respondents reacted positively to the question asking whether they felt that the provision of online government services would improve the delivery of services to citizens. In this case the Medway response were more positive; 283 out of 335 (80%) answered yes, which was significantly (χ^2 (1, N = 620) = 6.93 $p < 0.01$) higher than the Hillingdon response, which was 187 out of 265 (70%). From these results it can be concluded that although the residents in Medway were less familiar to e-services they were more encouraged that online provision of products and services would be of benefit. This also suggests to policymakers and other stakeholders promoting e-services provision that there is still enthusiasm for e-services and their actions and initiatives are being recognized; therefore, they should continue with their initiatives.

4.4 Focus Groups

To verify and to establish a deeper understanding of the survey, focus group participants were also asked the same questions and it emerged that a majority of the focus group respondents in Medway and Hillingdon welcomed the increased technological intermediation resulting from ICT diffusing into society. Respondents from the 17-24 and 25-34 age ranges and living in the rural locations of Medway and Hillingdon believed that although citizens resided in the rural areas they were not isolated by any means. They attributed this to the increased of ICTs in society. Respondent A, aged 19 stated "Now I have the Internet at home, I don't need to go into the town to do simple tasks such as paying a bill, it can all be done online, and it's so easy".

Also, during our visits it was observed that the older users had developed face-to-face and Internet lines of communication. That is, since the library offers longer hours of opening, citizens had access to the facilities. What was also found from an informal conversation was that if a group of the users attended a workshop offered by the library, they passed on the knowledge to the absentees who could not attend the workshop and relayed it either by meeting up at another suitable time or calling one another; thereby forming a new community of users who bonded due to the new service offered by the library.

However, the older participants recognised the increasing use of ICT in society as having a negative impact upon their lives. The elderly participants believed that everyday tasks such as withdrawing money have become difficult with the closure of rural bank branches and the increased use of Automatic Teller Machines (ATM's) and Internet Banking. According to respondent B, aged 62: "It is terrible. Our services are removed and replaced with these computers. I do not like using those cash machines (ATM's), the buttons are too small".

From the findings it was learnt that respondents in Medway and Hillingdon identified technophobia and a lack of knowledge as preventing citizens from accessing and/or using online government services and not only the government's lack of efforts. Respondents stated that they were not aware of accessing vast amounts of information on and that they could make use of online government services. Further, many of them asserted that they did not know how to use computers or the Internet. According to respondent C, aged 42 "I knew that I could Bank and pay my taxes online, but I didn't know I could access so many services". Whilst others suggested that they did not trust machines or themselves with machines. Instead they preferred speaking to an individual on a face-to-face basis as this ensured that the task is completed and responsibility is passed onto somebody else as according to respondent D, aged 32 "I don't like using computers; I prefer talking to someone to make sure the right thing [task or activity] is done"

At present, most respondents in Medway and Hillingdon choose to contact their local council via the telephone. However, the respondents, old and physically disabled preferred to speak to council staff face to face. According to respondent E, aged 57 "I prefer going down there [council offices] and speaking to someone. When you ring up, you just get moved [transferred] from one place to the next". Additionally, respondent F aged 64 stated "Staff at the council offices are friendly and help you with

you [with enquiries]. It's nice to go in there and talk to a face rather than speak to a voice on the phone".

5 ANALYSIS OF RESULTS

As explained in section 2 the strategic actions of *knowledge deployment and mobilisation* that were crucial for creating awareness for a new technology, in this section we analyse how the boroughs of Hillingdon and Medway following the government's strategy used those actions to promote e-services.

Knowledge Deployment is the stimulation for the dissemination of new knowledge. Entities that can be supported for this action from the administration are research institutes in university or industrial environments. In this paper it was found that that the main motivation for the local authorities to promote e-services has been driven by the government's vision. However, to obtain fruition to e-service projects, funds from other sources such as the Lottery fund have been sought. Further it has been found that in both vicinities promotional policies specifically for the elderly and ethnic minorities have been deployed. In this case it was established that the Hillingdon local authority has deployed a promotional policy, the 'People's network' to ensure that all the citizens will be able to use the newly offered technology-e-services. Also, Hillingdon has installed a champion who will cater to all the problems faced by the elderly citizens, including technology related ones. Further both vicinities have established technology access points within established and trusted community centers, but Medway has gone further for the ethnic minorities to establish an access point within a temple, a place of trust and accessibility. The success of the initiatives are being felt, although gradually. For instance, in section 4.2 it can be learnt that citizens believed that online government services would improve services afforded by the government.

Further means of determining the success of this action can be obtained by examining other success countries actions. The South Korean case is a very good example. The Korean government deployed a variety of promotion policies designed to boost Internet use amongst the population with tremendous success (Choudrie et al., 2002). These measures included IT literacy and Internet literacy programmes targeted at housewives, the elderly, military personnel, farmers and excluded social sectors such as low-income families, the disabled and even prisoners. The government set up the "Ten Million People Internet Education" project in June 2000, which aims to provide Internet education to 10 million people via a range of different programmes. This promotion activity contributed towards the nationwide Internet boom, with 4.1 million people including one million housewives being provided with basic internet skills in 2000.

In line with the South Korean policies, the Hillingdon and Medway authorities used the knowledge deployment mechanism to offer free Internet use and training, thereby preparing the ground for the widespread adoption of e-services within less privileged parts of the population. The Peoples network and offering within community centers and the places of worship are examples of such policies that nevertheless need to be supported by other actions similar to the ones taken by the South Korean government.

Mobilisation expresses the intention of the government to make organisations/individuals to perceive the innovation, the potential benefit of the innovation in the 'right' way and understand the best practice for adopting it and encouraging them to do so. In order to encourage use of e-services the local authorities have attempted to demonstrate and increase visibility of the e-services. For this the assistance afforded to citizens on websites using translation services and the council offices use of trained translators will attempt to demonstrate the success of e-services to the citizens. Further, from the secondary sources and interviews with the e-government programme manager in Hillingdon it was suggested that the high speed internet broadband connections in every library and the PCs afforded to the libraries using the lottery funding were critical. The support offered to the citizens in the libraries either by the equipment or trained library staff ensured that the benefits of e-services were illustrated and explained in an appropriate manner.

Although the local government initiatives are aiming to place all public services online by the end of 2005 (Beynon-Davies, 2004) it was interesting to note that in our sample the citizens had little awareness of and an even smaller number had made use of the e-services. Therefore, the government should raise the awareness amongst the citizens. Further support for this is provided in section 4.2 where citizens thought that by offering online services the provision of services to citizens will improve; thus once again supporting the action of *mobilisation*.

6 CONCLUSIONS

As e-services are still emerging within the population so is this research. Although the results of this research cannot be generalized, it can be concluded that the results in this research indicate that if local government policies such as the People's Network awareness campaign and those within community centers and places of worship are pursued at their current rate and spread more widely amongst members of the community, then it is possible that the government's target for e-services will be eventually achieved. However, this also depends upon how many more successful campaigns and promotional policies are provided and also whether all the citizens are accepting, trusting and supportive of these actions. If as in the case of countries such as South Korea the citizens become aware of the potentials of e-services, which is also something that we are beginning to witness nationally in the UK, then success can be achieved and the future for e-service take up numbers look bright. However, if the citizens are not supportive and not accepting then a diverse form of digital divide [rural and urban areas and ethnic minorities] can occur, which is something that this research also found.

In terms of e-society it can be concluded that by establishing services such as the Peoples network, governments are ensuring that an equitable distribution of e-services occurs. By offering free access to the Internet and other facilities afforded by online services are evident, the government is ensuring that citizens who will not be able to use the technology and devices due to affordability are not excluded, thereby preventing any exclusion. However, what remains to be determined is whether the citizens will be enticed enough to either purchase a Personal Computer (PC) or visit the library whenever the need for an e-service is demanded. Alternatively, governments might have to adopt measures such as those adopted in South East Asian countries? That is, for example, in Singapore free PCs in certain instances or some form of subsidy to the less advantaged population of the country were offered; thereby promoting a more equitable distribution amongst the population. Therefore it can be learnt that the contributions of this research lie not only for governments as just suggested. There are also lessons to be learnt for ISPs. By referring to research such as this, more information on local areas in the UK that still require online government services is provided. Also, other groups of society that require online government services such as the ethnic minorities and disadvantaged are identified; therefore the ISPs efforts could be placed towards eliminating the divide that could occur in the future. For management consultants this research offers a diverse focus [ethnic minorities and disadvantaged] to an area [e-services] that is of immense current interest.

However, it has to be remembered that this research as is the diffusion of e-services is in the emerging stages. For this reason the diffusion of e-services is still a subject of immense interest for academics and should be examined in an in-depth manner. It is therefore proposed that in the future a longitudinal study of the diffusion of e-services should be undertaken. Further, this research emphasised 2 strategic actions critical for e-services diffusion-*mobilisation* and *knowledge deployment*. These actions are part of a framework that consists of 6 actions-*knowledge awareness, mobilization, knowledge deployment, subsidy, standard setting and innovation directive*. Future directions for this research lie in e-services diffusion being examined using all the 6 actions.

REFERENCES

BBC (2003) "BBC News: *digital divide hits black families*" Available from: http://news.bbc.co.uk/1/hi/education/3193512.stm [Accessed on 01/09/2005]

Becker, S.A. (2005) "E-Government Usability for Older Adult" *Communications of the ACM,* **48** (2) pp 102 - 104

Beynon-Davies, P. (2004) "Constructing electronic government: the case of the UK inland revenue". *International Journal of Information Management* **25**, pp 3-20

Brants, K. and Frissen, V (2003) "Inclusion and Exclusion in the Information Society", Available from http://lse.ac.uk/collections/EMTL/reports/brants_2003_emtel.pdf [Accessed on: 27/07/2005]

Choudrie, J., Papazafeiropoulou, A. and Lee, H. (2003). *'Applying stakeholder theory to analyse the diffusion of broadband in South Korea: the importance of the government's role'*, Proceedings of 11th European Conference on Information Systems (ECIS 2003), June 19-21, Naples, Italy.

Census (2001). National Statistics. Available at: http://neighbourhood.statistics.gov.uk/dissemination/AreaProfile2. Viewed on November 7, 2005.

Crown (Unknown) "Modern Councils, Modern Services – Access for all", Office of Deputy Prime Minister, HMSO, Available from: http://www.odpm.gov.uk/stellent/groups/odpm_localgov/documents/page/odpm_locgov_605195.hcsp

Fulcher, J., and Scott, J (2003) "*Sociology*" Second Edition, Oxford University Press, Italy

Gilbert, D., Balestrini, P., and Littleboy, D., (2004). "Barriers and benefits in the adoption of E-Government". *The International Journal of Public Sector Management,* **17** (4), pp 286 – 301

Heeks, R. (2004). eGovernment for Development : Basic Definitions Page. Viewed on October 10, 2004. Available at: http://www.sed.manchester.ac.uk/idpm/publications/wp/igov/igov_wp15.htm

Hendry, J.D. (2000) "Social Inclusion and the Information Poor" *Library Review*, **49** (7), pp 331 – 336

Hicken, M (2004) "To each according to his needs': public libraries and socially excluded people", *Health Information and Libraries Journal*, **21** (2), pp 45 – 53

Institute for Public Policy Research (2002), "*Time to re-boot e-democracy to end the 'digital divide' warns IPPR*", Institute of Public Policy Research. Accessed from http://www.ippr.org.uk/pressreleases/archive.asp?id=611&fID=59 [Accessed on: 27/03/2005]

Jones, D. S., with Crowe, B. (2001) "Transformation not Automation – The E-Government Challenge", Demos, UK

King, J., Gurbaxani, V., Kraemer, K., McFarlan, F., Raman, F. & Yap, F. W. (1994). Institutional factors in information technology innovation. *Information Systems research* 5, 139-169.

Land, F., Sorrentino, M., Andersen, K.V., Cushman, M., Damdoran, L. and Reid, M. (2005). "E-Government: the Citizen and Equity". Research Panel in *European Conference on Information Systems*.

Mason, S M and Hacker, K L (2003). Applying communication theory to digital divide research. IT and Society, 1 (5), 40-55.

NARM (2002). Market Forecast Report: Portrait of Online Users. Available at: http://www.narm.com/research/briefs/02JanResBrfs.pdf. Viewed on: October 21, 2005.

OECD (2004). 'Broadband access in OECD countries per 100 inhabitants, Dec 2003', OECD, Paris.

ONS (2001). *Classification of Ethnic Groups.* Accessed from: http://www.statistics.gov.uk/about/Classifications/ns_ethnic_classification.asp, [Accessed: 14/04/2005]

Papazafeiropoulou, A., Pouloudi, A. and Currie, W. (2001) Applying the stakeholder concept to electronic commerce: extending previous research to guide government policy makers. Proceedings of Hawaii International Conference on Systems Sciences (HICSS-34), 3-6 January, Maui, Hawaii.

Rogers, E. M. (2003). *'Diffusion of innovations (fifth edition)',* Free press, New York.

Teicher, J., Hughes, O., and Dow, N., (2002). "E-Government: a new route to public sector quality". *Managing Service Quality,* **12** (6), pp 384 – 393

National Statistics (2002). Internet Access: Households and Individuals. Available at: http://www.statistics.gov.uk/ Viewed on October 15, 2005

Warschauer, W. (2004) "*Technology and Social Inclusion – Rethinking the Digital Divide*" MIT Press, USA

Weerakkody, V., Choudrie, J., and Currie, W., (2004). "Realising E-Government at the local level in the UK: Local and National Challenges". *Proceedings from Americas Conference of Information Systems*, 2004.