Lessons learnt from the broadband diffusion in South Korea and the UK. Implications for future government intervention in technology diffusion

Jyoti Choudrie

School of Business and Economics

University of Wales, Swansea

Haldane Building

Singleton Park

Swansea

Wales

SA2 8PP

Tele: 0044 1792 513085

Fax: +44 (0) 1792 295626

e-mail:j.choudrie@swansea.ac.uk

Anastasia Papazafeiropoulou,

Department of Information Systems and Computing

Brunel University

Uxbridge UB8 3PH

United Kingdom

Tel: 0044 1895 274000

Fax: 0044 1895 251686

Anastasia.papazafeiropoulou@brunel.ac.uk

Lessons learnt from the broadband diffusion in South Korea and the UK. Implications for future government intervention in technology diffusion

Abstract

Governments around the globe are rapidly introducing e-government initiatives with the role of the Internet being regarded as pertinent. Information and Communication Technologies (ICTs) offer the capacity to an improved Internet. Broadband technology is a form of ICT that is currently being adopted and diffused in many countries. In this paper we outline how the role of the government can sustain broadband adoption. We use a framework developed by King et al. (1994) regarding institutional actions related to IT diffusion and examine the institutional actions taken by the South Korean government (hereafter referred as Korea) and we compare them with relevant policies pursued in Britain (hereafter referred as UK). We demonstrate that a comparison between the IT policies of the two countries allows research to extract the "success factors" in government intervention in supporting technology diffusion, in order to render favourable results if applied elsewhere.

.

Keywords

Broadband, United Kingdom, Korea, IT diffusion and adoption, government role

Reference to this paper should be made as follows: Choudrie, J. and Papazafeiropoulou (2006) 'Lessons learnt from the broadband diffusion in South Korea and the UK.

Implications for future government intervention in technology diffusion' Electronic Government: An International Journal, Vol. XX No.XX , pp. XX

Biographical Notes: Dr. Jyoti Choudrie is a Senior Lecturer in the School of Business and Economics, Swansea University. Previously she was a lecturer in the School of Information Systems, Computing and Maths, Brunel University. She obtained her PhD on 'Investigating Reengineering Teams in the Context of Business Process Change' from Brunel University. Her current research encompasses the diffusion and adoption of broadband technology, the usability of e-government web sites, the impacts of the diffusion of broadband technology on electronic government, the social aspects of information systems, and electronic commerce. She has written for peer reviewed journals such as the *European Journal of Information Systems (EJIS)*, *Journal of Information Technology (JIT)*, and *Journal of Computing and Information Systems (JCIS).*

Dr Anastasia Papazafeiropoulou is a lecturer at the Information Systems and Computing department at Brunel University, UK. She has received her PhD, titled: "A stakeholder approach to electronic commerce diffusion", from the same university. She has worked as a technical trainee in the European Union (EU) in Brussels and as a research associate with expertise in electronic commerce at the Athens University of Economics and Business and Brunel University. She holds a first degree in Informatics (1994, Athens University of Economics and Business, Greece) and a M.Sc. in Information Systems (1997, Athens University of Economics and Business, Greece). Her research interests fall within social aspects and policy issues related to the diffusion and adoption of information technologies. The domain areas she is actively involved are: electronic commerce, broadband Internet, Enterprise Resource Planning Systems (ERPs) and healthcare.

1. Introduction

Since the advent of the Internet, business opportunities involving Information and Communication Technologies (ICTs) have multiplied, persuading not only commercial enterprises, but governments around the globe to invest profoundly into e-services. The e-services offered by governments are aimed at relaying information and public services to citizens over the Internet and is referred to in general as 'e-government'. E-government encompasses a broad spectrum of activities that are offered using ICTs and allows an improved service of the government to citizens (Northrup and Thorson, 2003). A popular inferment to e-government as Eyob (2004) found is that it is an, "extension of e-commerce to government procurement". There are many varying definitions of e-government, but for the purposes of this paper, the following definition is offered. *E-government is the delivery of online government services, which provides the opportunity to increase citizen access to government, reduce government bureaucracy, increase citizen participation in democracy and enhance agency responsiveness to citizens needs* (Prins, 2001). The importance of e-government has been considered to be crucial for being a means of "converging ubiquitous access to government information and services and total transparency of government functioning: A stage that contributes to the social and economic wellbeing of citizens (Banerjee and Chau, 2004).

However, there is a growing trend of government intervention in IT innovation in general (King et al., 1994) and Internet exploitation in particular (Press *et al*., 1998). National interests in broadband clearly fall within this ICT policy trend. Broadband diffusion and capacity development are central to debates in many countries surrounding the role of the government in developing broadband capacity, particularly focusing on the use of public money (e.g.BSG, 2002).

The research question guiding this paper is: What can be learnt about the government intervention for the future adoption of broadband technologies by examining some of the experiences of the world leader at broadband diffusion (Korea) and comparing them to a country that is striving to to have the most extensive and competitive broadband market in the G7 by 2005 (UK). In line with that the aim of this paper is to extract the "success factors" in government intervention in supporting technology diffusion, based on the comparisons between Korea and UK in order to render favourable results if applied elsewhere.

The paper is structured as follows. First we give a brief overview of the Korean and UK broadband markets, bringing in to the fore the difference in the geography and demographics between the two countries. Second we discuss the research methodology followed by this research. In the third section we provide the theoretical framework upon which the results were based. Section four provides a comparison of the diffusion strategies of the Korean and UK government strategies in terms of the normative model. Finally, based on the comparison between the two countries, we offer some recommendations for government intervention in technology diffusion.

2. Broadband in Korea and UK

South Korea has the highest penetration of broadband in the world. To date, there are 10 million broadband users in the country (Yang, 2002). Broadband services were first launched in South Korea in July 1998 and the 1 million-user milestone was reached in April 2000. This marked the real take off point in the South Korean broadband market with operators witnessing explosive growths in subscribers over the next two years (Yang, 2002). The South

Korean government expects the market for the current generation of broadband services (between 2 and 8 Mbps) to reach saturation point by the second quarter of 2003 (Ministry of Information and Communication, 2002). In its *Internet White Paper* ((MIC). and (NCA). 2002), the South Korean Ministry of Information and Communication (MIC) has now set a new broadband objective of the provision of 20Mbps to home consumers by 2005. The case of Korean broadband adoption has been widely reported as one of the most successful cases of technology diffusion (Im and Seo, 2005; Choudrie *et al.*, 2003a; OECD, 2003). South Korea is a useful example with implications for information technology diffusion and for country-level diffusion policies (Im and Seo, 2005). The case shows that the government intervention is a very important element in the application of effective information technology policies (Yu and Fang, 2005; Choudrie *et al.*, 2003b). Apart from the government a number of other private and public organisations played an important role in the process (Im and Seo, 2005). Although the agendas of those stakeholders were diverse, they all contributed to a success story.

In the United Kingdom the government is targeting to have an extensive and competitive broadband market in the G7 by 2005 (BSG, 2002). By obtaining such a position, the government intends to achieve tremendous improvements to the economy via increased spending in the technology and telecommunications sectors. To date, there are 2.335 million users of broadband within the UK and 32,000 new users per week are being signed on (Oftel, 2003; Arnott, 2003).

A factor that may explain the differences between the broadband adoption patterns of the two countries can be attributed to their housing patterns (Lee and Choudrie 2002). The major

Korean cities are densely populated and include high residential building blocks, therefore offering easy access to the broadband infrastructure. In contrast, the UK housing patterns are scattered, making infrastructure building difficult. Specifically, dense housing patterns deliver significant economies of scale for broadband network deployment and the fact that 80% of Koreans live in densely populated urban areas (and 49% live in large apartment complexes) means that South Korea has the ideal geography for the cost effective deployment of broadband infrastructure. Contrastingly, 80% of the UK population live in cities and towns of over 10,000 people but these only cover some 7% of the land. Over 40% of the population live in London, the conurbations and the bigger cities. Each of those major urban areas has a potentially wide influence. London is the second most densely populated region in Europe with the housing patterns being as follows. 81% are houses; 50% are detached or semi-detached houses (ODPM, 2001). Recent figures suggest that broadband availability is highest in urban and suburban areas since the economies of density make it much more cost effective for its spread (BSG, 2002), a case similar to that of Korea.

Another major issue that can explicate the reason for the differences in the adoption patterns of the two countries is cultural. The Koreans are a collectivist society, therefore if one person in the social group has found that his child/ren are benefiting from the use of broadband, then the rest of the group will also prescribe to the same belief and obtain broadband. Thus, the adoption of broadband was assisted to an extent by this attitude. Research has also found that the Koreans associate “education as a means of gaining prestige in one’s social environment and of joining a higher status group (“a ticket to ride”)” (Hofstede, 1991). Further in the Korean society parents are influenced by what the teachers ascribe to them; therefore, if a teacher or the school is using broadband and feels that it is beneficial for the teaching and learning of the child, then the parents will also adhere to the same philosophy and ensure that

the child/ren will also abide to the same viewpoint. This attitude was verified by observing the people and also from the interviews that were conducted with the government and private sector organisations. The Korean case illustrates that if the demand for broadband Internet access can be matched by cultural expectations, such as the Korean emphasis on education, then diffusion can be rapid. When the Korean government set up Internet promotion policies, they identified the cultural demand on the Internet, particularly among females. This case of swift broadband Internet diffusion and usage in Korea demonstrates the importance of cultural sensitivity in the promotion.

In this paper, we recognise that both the culture and housing patterns are the most differentiating factors when comparing the two countries; however we argue that there are other factors that can emerge when a theoretical perspective is applied and can lead to the identification of the "success factors" in government intervention in supporting technology diffusion if applied elsewhere.

The paper is structured as follows. In the next section we present the methodology followed for the collection of the data. In section 4 we analyse the broadband diffusion strategies pursued in both Korea and UK and in section 5 we draw some conclusions on information technology policy making based on our results.

3. Research Methodology

The research methodology followed for this research was based on the collection of primary and secondary data. The research undertaken upon Korea used primary data, whilst that of

the UK, secondary. The following discussions describe the reasoning for the pursued strategies.

Previous research suggesting a successful penetration of broadband in Korea utilised mainly secondary data to ascertain this issue (Lee *et al*, 2003). This research went a step further and used mainly primary data obtained from face to face interviews.[1] To validate and verify the findings, secondary data in the form of archival documents, newspaper articles and government statistics were further used.

Interviews, referring to archival documents and observations were the main data collection techniques used for this research. The interviews were conducted at the premises of the 10 visited organisations and the number of people interviewed varied from two to six members of staff. The interview meetings were arranged with nine organisations which are involved in the broadband related area from private and public sectors ranging from equipment manufacturer, service provider to research institute and a government department. The list of the organisations and reasons for selection is described in Table 1.

Table 1. List of the organisations visited in Korea

Hanaro Telecom, Inc.	The second largest broadband provider www.hanaro.com

[1] The Overseas Mission to Korea, supported by the International Technology Service, Department of Trade and Industry, the United Kingdom, was conducted to study its broadband development (Lee and Choudrie, 2002). The mission delegates, including an author of this paper, visited and stayed in Seoul from 21st to 27th July 2002.

NHN Corporation	Online game portal www.nhncorp.com
NCsoft Corporation	Online game company of the most popular game called Lineage www.ncsoft.net
KT	The incumbent operator with the biggest market share of broadband www.kt.co.kr
SBSi	A relatively new broadcast company, which is running a video-on-demand business www.sbs.co.kr
Samsung Electronics	Equipment vendor. www.samsungelectronics.com
Korea Information Society Development Institute (KISDI)	Think-tank specialising the telecommunications sector and information society issues www.kisdi.re.kr
Korea Education & Research Information Service (KERIS)	Research institute for information services in education www.keris.or.kr
Ministry of Information and Communication (MIC)	www.nic.go.kr

The interviews were conducted in the form of a meeting between the mission team and participants from each organisation. The mission team consisted of two academics, 5 industry people from telecommunication companies such as BT and Cable & Wireless, and a representative from the government advisory body on broadband (Broadband Stakeholder Group). They had various backgrounds: technologists, academics, business managers and consultants. This approach was adopted to prevent a biased opinion from emerging; we form a research team whose members have a variety of backgrounds similar to those of the group being studied (Wax, 1986). This reasoning was prescribed at the time of selecting the team members.

The questions used in the interviews were open-ended ones in order to promote further and deeper discussions into the topics of interest. Since the candidates selected for the interviews were familiar to and offered expertise in the area, close ended questions were avoided. The objectives and questions of the mission team were delivered in advance in the form of a standard topic list to the host organisations. This included four main topic areas: Users (characteristics, online behaviour), Industry (main players, motives, operations), Government (regulation, role in the provision of broadband), Others (infrastructure, impacts of broadband on the economy, payment methods). In a typical meeting, the host organisation initially gave a presentation that intended to answer those questions, followed by questions/answers and discussion. The meetings lasted typically for two hours; however, the exception was the meeting at KT that lasted for four hours. Participants from each host company were considered within the host organisations as experts in the areas under discussion. They ranged from rank and file employees to top management, and were directly involved in the broadband business and research activities. For example, participants were usually involved in the formation of the broadband strategies of their companies. Government officials who were interviewed had hands-on knowledge about the way that broadband was deployed and in certain instances were part of the policy making process. During the interview process, open-ended questions were used in order to promote discussions into the topics of interest. The number of participants in each meeting varied from two to six. Although most of them spoke English, a professional interpreter was used when necessary.

The minutes of each meeting were note-taken by one of the team members and re-written later on. Thereafter, the notes were distributed within the team in order to verify the details. An extra measure was adopted to ensure that a bias was prevented when the report was written. Pairs of individuals from diverse backgrounds were formed. For instance, while the

representative from the government advisory body focused upon policy issues of his interest, another member of the team from a different area, say from industry, joined him to add a different perspective.

4. The role of the Korean and UK governments in IT diffusion

The issue of government's influence on technical innovation dates back to the nineteenth century, where the administration intervention was in contrast with the general *laissez-faire* economic philosophy. Later governments began to get more involved in the field and today there is no doubt that the government market has an important influence on industrial innovation (Rothwell and Zegveld, 1981).

Japan was the first country where in the 1960s, the government had the main responsibility to encourage the introduction of new technologies and design a long-term technology policy (Freeman, 1998). Later (mainly in 1970s and 1980s), the governments in Western Europe and North America worked along the same patterns in government intervention but following different conceptions of competitive advantage. Finally in the 1990s, there was an agreement in the literature about the vital role of public administration in the diffusion of new technologies (e.g. (Neo *et al.*, 1993; King *et al.*, 1994; Neo *et al.*, 1995; Rapp, 1996)).

In the case of Internet technologies such as broadband, although there is a tendency to move from *localisation* to *globalisation*, national governments still play a very important role in the design of strategies reflecting to a vision towards National Information Infrastructure (NII) (see (DTI, 1998; The White House, 1999; Ministry of Information and Communication (MIC), 2002)).

Viewing broadband technology as a technological innovation that has the potential to revolutionise the use of the Internet by small companies and individuals, in this section we describe strategies and measures commonly used by national governments in the diffusion of such technologies. We examine how the South Korean government acted as a powerful entity that applied these strategies and hastened the adoption of broadband in the society. The relevant UK strategies are also presented for our analysis.

The framework selected for this research is that proposed by King et al (1994). The researchers have used the demand-pull and supply push theory in government intervention for technology diffusion. They argue that governments can either be influential or regulatory. Combining the two modes of introversion with the two types of driving forces six main institutional actions are defined. These are knowledge building, knowledge deployment, subsidy, mobilisation, innovation directive and standard setting are presented in figure 1.

	SUPPLY PUSH	DEMAND PULL
INFLUENCE	Knowledge building Knowledge deployment Subsidy	Knowledge deployment Subsidy Mobilization

	Innovation directive I	 II
REGULATION	III Knowledge deployment Subsidy Standard setting Innovation directive	IV Subsidy Standards setting Innovation directive

Figure 1. Dimensions of Institutional Intervention (Source: King, et al., 1994)

Using the above framework we examine how the Korean and the UK governments have used certain policy measures in order to diffuse the broadband technology.

The strategies of *knowledge building* and *knowledge deployment* refer to financial support for research and development (R&D) and the dispersion of new knowledge to individuals and organisations such that they are able to use the new emerging technology correspondingly. Entities that can be supported for this action from the administration are research institutes in university or industrial environments.

The Korean government deployed a variety of promotion policies designed to boost Internet use amongst the population. 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. Amongst

the programmes for computer and Internet literacy, the one for housewives is an interesting example. The MIC set "homemakers" as its main target (married females not in employment). Government subsidies were granted to private IT/internet training institutes for training homemakers, which allowed them to undertake Internet courses at an affordable price. The programme was a success and created an Internet "boom" among housewives. The rationale for targeting housewives was that they controlled the household budget and had a strong influence upon purchasing decisions made by the families. Policy makers believed that without the homemakers' commitment to the Internet, its diffusion among households could be retarded. Most importantly, the programme identified the shared feeling among housewives of "being left behind" or "being ignored by their own children", and so it stimulated a hidden demand for the Internet, particularly for its use in their children's learning (Choudrie et al., 2003).

The UK government has also lately recognised the importance of deployment of technology and has begun to provide funding for the acquisition of new knowledge. This has been implemented by government departments such as the Department of Further Education and Skills (DfES) and private organisations such as e-skills UK. The government invested £3 million in the private organisation known as e-skills UK which has become one of the first of 23 sector skills councils being created to give employers a direct input to government training policy and the development of courses in schools, colleges and universities (Goodwin, 2002). To prevent only a focus upon the youth, the government is also promoting use of computers amongst the older generations by having buses travelling around the country and introducing this group of the society to the benefits of this technology (Cushing, 2002). Additionally the government has opened approximately 600 training centres that are located within easy access of the citizens. Therefore, diverse local community centres,

shopping centres, pubs, football clubs and funfairs are providing training and knowledge about IT (Lynch, 2001).

Subsidy can be direct, with financial support to all actors involved in the technical innovation, or indirect, with support for infrastructure building and establishment of favourable charging mechanisms for network services. In the technologically advanced countries today subsidy has moved from the traditional direct financial companies' support to more complex schemes. For example, private subsidy, mainly through venture capital companies, has been broadly used by governments as a way to fill the funding gaps of private financial support schemes (OECD, 1997).

Recognising that the high cost of deploying new local access networks was a barrier to broadband roll-out, the Korean government provided pump priming funding to facilities service providers (FSPs) through the provision of loans at preferential rates worth US$77m in 1999. A further US$77 million was provided to FSPs in 2000 for less densely populated areas, small cities, towns and regional industrial complexes. This funding has been extended to include supplying broadband to rural areas and will continue until 2005 with additional investments amounting to US$923 million (Lee and Choudrie 2002).

Unlike the Korean government and other governments such as Sweden, USA and France that have spent large amounts in obtaining broadband to the rural area, the UK supports a different view. It favours a market-led approach in conjunction with a drive towards aggregating the public sector demand for broadband (Wearden, 2002).

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.

The Korean government ensured that the potential of broadband was demonstrated and visible. For this, construction of test beds connecting 5 GigaPoPs in major cities and providing support for the research of next generation Internet technologies such as Ipv6 Backbone, QoS backbone and Multicasting backbone was pursued (Ministry of Information and Communication, 2002).

There is no such action that is undertaken within the UK. However, communities, focus groups and the media have been working hard to describe the potential of this technology. In the UK, for example, the focus group Broadband Stakeholder Group in its first annual report recommended a strategy for accelerating the broadband penetration which included 15 strategic recommendations in three areas: accelerating market driven deployment and take-up, enabling public sector driven deployment and use, and ensuring appropriate regulation (BSG, 2001). While 14 out of 15 recommendations were accepted by the government, one recommendation on fiscal policy for tax incentives to boost the broadband infrastructure was refused (Adshead, 2001). This caused a campaign called 'Broadband Britain?' to occur from the industry to urge the government to act in order to meet its pledge for the most competitive broadband market to be formed by 2005 (Arnott, 2001).

*Innovation directive*s are norms that regulate the production or use of innovation in the governmental regime in order to set an example for companies and individuals that tend to use the technology.

The Korean government has made large investments into the e-government area. The government set up a special committee for e-government projects in May in 2001 and poured in a total of 290.3 billion won, linking up different public databases and streamlining electronic administrative procedures. November 13, 2002 foresaw the Korean government formally announcing that 11 e-government projects have been completed, paving the way for full-fledged electronic administrative services that could save citizens both time and money. By demonstrating the benefits to the members of the public the Korean government hopes to convince them about the potential of broadband.

The UK government is also following a similar path and is making substantial investments to the e-government initiatives. During 2000 the Prime Minister pledged £1 billion to e-government initiatives and the results are that an electronic service has been established for organisations interested in investing in the UK and to provide information and services, such as training how to conduct e-business in other countries, to learn of the new cultures and the way that they conduct business, and financial assistance can also be provided by qualifying for specific awards. Such measures should allow British organisations determined or already established in foreign shores to make a mark in the international markets (British Trade International e-business Programme, 2002). Citizens are also being catered for. For instance, parents can obtain online information about schools within the country and the pension bearing citizens can find out about their pensions and receive payments electronically (Lynch, 2000). In terms of the success of the e-government success or failure rates, the UK was viewed to be eighth amongst twenty two countries for its e-government initiatives (Lynch, 2001).

Standard setting refers to the formalisation of practices and limitation of options for organisations participating in the technology innovation.

As early as 1995 the Korean government established comprehensive plans that detailed the number of houses that would be targeted and also how it would be disseminated. For instance, it detailed how networks of a high capacity would be obtained through market competition. In order to ensure that the consumers were obtaining a suitable quality of bandwidth, certification was provided. The Korean experience revealed that the certification afforded to apartment buildings that offered quality broadband services are a prime example of standard setting. The notion of providing broadband Internet service to newly built apartment buildings was conceived by some construction companies and Hanaro (IT Korea 2002, MIC). The success of Cyber apartments led to Hanaro's rapid growth in the market. The government strengthened this trend by introducing the Cyber Building Certificate system, under which the authority concerned issued a certificate to a building with high-speed telecommunications capacity. 3 levels of standards on domestic and business premises were established and granted the certificates to qualified buildings. This certification gave builders a motivation to enhance the broadband access platform of apartments and buildings being constructed, as most residents want to live in high capacity cyber apartments. This system has worked particularly well in the Korean housing pattern in which apartments account for half of the total housing (Choudrie et al., 2003).

The UK government has lately realised the importance of standards setting and is now in the legislator planning stages towards the building industry with the view to offer broadband infrastructure to households such cable and wireless connections (Wearden, 2003). Additionally, Oftel the regulatory body in the UK has been working towards redefining

broadband as there are Internet Service Providers (ISPs) attempting to confuse consumers, and they are also looking at the establishment of fair market prices (Ritchardson, 2003).

After the analysis of the policy measures pursued by both the Korean and the UK governments, in the next section we draw some conclusions and offer some recommendations related to government intervention in supporting technology diffusion.

5. Policy implications-Conclusions

By setting out a clear vision and strategy the Korean government ensured a high degree of confidence and certainty for private sector companies investing in broadband. Its commitment was based on a belief that the country's long term economic development rested on its ability to compete in a global knowledge based economy. On current performance this policy appears to be bearing fruit. Although more technologically advanced countries may have different priorities in policy agenda from those of Korea, they can demonstrate a similar level of commitment to the knowledge economy by exploiting the full potential of ICT and broadband in its public services, by emphasizing the importance of IT literacy and PC skills for education and life long learning and by reducing the burden of regulation on business.

Demand forces played an important role in the adoption broadband in the Korean case. A demand-focused approach was regarded as more important than a supply one in stimulating technology innovation and application. Users must be prepared to use new technologies and services so that they can benefit from the enhanced capabilities. Therefore, the Korean government pursued a variety of policy measures to create Internet demands along with support for network infrastructure. Examples are the "Ten Million Internet Education"

programme and provision of broadband connection to all elementary, middle and high schools across the country. This focus on the demand side contributed to the nationwide Internet boom in Korea altogether with PC Bangs, online games, online stock trading, and so on. Additionally according to our analysis regulation was a major care of the Korean government in terms of infrastructure and market competition making the government a dominant player in the diffusion of broadband. Using the framework of King at al. (1994) presented in section 4 we can see that the predominant quarter in the Korean case is that of the demand pull and regulatory strategy as shown in figure 2.

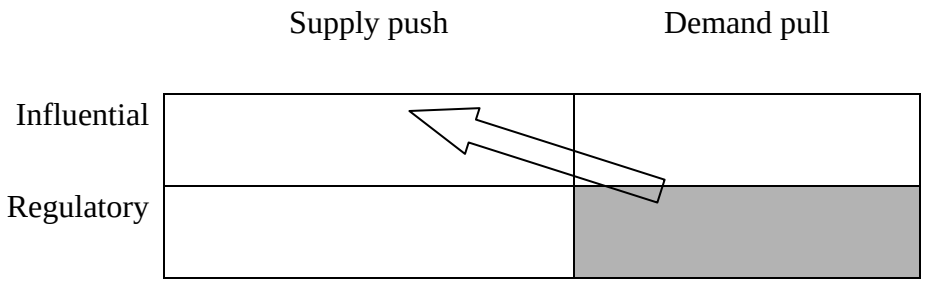

Figure 2: The Korean broadband strategy

Indeed, the aggressive broadband diffusion strategy of the Korean government lead to the deployment of a heavy regulatory framework and support of the demand pull forces (represented by the grey area in figure 1) with phenomenal success. Now, as the broadband market is getting more mature the Korean government is moving towards less assertive policies by allowing development of competition in the market and consequently enforcement of the supply push (represented by the arrow in figure 2). As one directors of of KT, the operator with the biggest market share of broadband in Korea, reported: “From now on broadband market will lead to quality competition through higher speed connections, quality of service and low prices”.

In the UK, the government established a clear goal for broadband as well by stating that the technology will allow the country to become the leader within the G7 for e-commerce. Nevertheless, according to our analysis the policies pursued by the government were mostly influential with emphasis on the supply push (represented by the grey area in figure 3), leaving the competition to lead the market. Today, as the government's goal seems to remain only a goal with broadband take-up being relatively low the government is looking at developing educational programs enforcing the demand pull while looking at regulating the vendors market. The results of these efforts are encouraging with increased numbers of subscribers and positive projections for the future.

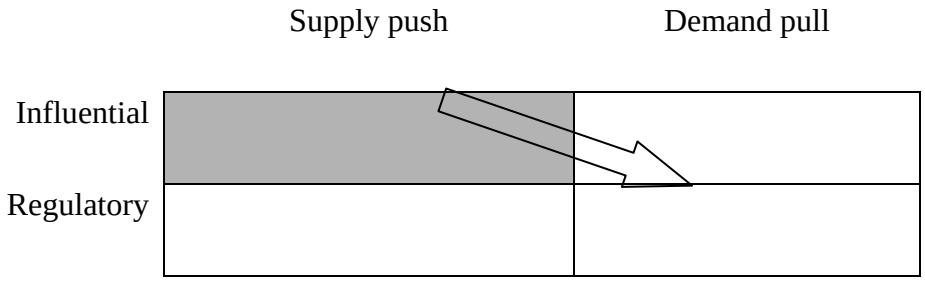

Figure 3: The UK broadband strategy

Our analysis demonstrated that the principles of broadband diffusion strategy in the two countries are different as well as their results. While Korea has a tradition of interventionist government, UK keeps a pro-market policy. Given the tendency in the UK, BT's action in 2002 cannot be attributed directly to the government influence. At the same time, however, it cannot be denied that the government's push for the ambitious goal for the leader in broadband did not affect the incumbent operator's action. In addition, a variety of measures implemented by the government contributed to changing the broadband environment.

Although each national setting is different in terms of culture, geography and social structure we believe that successful or less successful IT diffusion strategies can be useful lessons for

policy makers seeking to promote broadband, which can assist in obtaining e-government services in the future.

8. References

Arnott, S. (2003). 2005 deadline for broadband Britain. Available at: http://www.computing.co.uk/News/1148541

Banerjee, P. and Chau, P.Y.K. (2004). An evaluative framework for analysing e-government convergence capability in developing countries. *Electronic-Government: An International Journal*, 1, 1, pp. 29-48.

Broadband Stakeholder Group (BSG), (2002). **Second Annual Report and Strategic Recommendations**.

http://www.broadbanduk.org/reports/report03.htm, Nov.

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

Choudrie, J., Papazafeiropoulou, A. and Lee, H. J. 2003b. 'The Role Of Various Stakeholders In The Application Of Effective Diffusion Strategies: A Case Of Broadband In South Korea', *Journal of Information Technology*, Forthcoming Dec 2003

Cushing, K. (2002). **IT gets on the bus to reach OAPs**. www.computerweekly.com. April 18.

DTI 1998. '*Net Benefit: The Electronic Commerce Agenda for the UK, forwarded by Barbara Roche'*, DTI, London.

Eyob, E. (2004). E-government: breaking the frontiers of inefficiencies in the public sector. *Electronic –Government: An International Journal.* 1, 1, pp. 107-14.

Freeman, C. 1998. 'Japan: A new national system of innovation?' *In Technical change and economic theory* (Ed, (Eds, Dosi, G., Freeman, C., Nelson, R. and Soete, L.) Pinter Publishers, New York.

Hofstede, G. (1991). *Cultures and organizations: Software of the mind.* London: McGraw-Hill.

Im, J.J.H. and Seo, J-W. (2005). E-government in South Korea: planning and implementation. *Electronic-Government: An International journal,* 2, 2, pp.188-204.

King, J., Gurbaxani, V., Kraemer, K., McFarlan, F., Raman, F. and Yap, F. W. 1994. 'Institutional factors in information technology innovation', *Information Systems research,* 5(2): 139-169.

Lee, H., O'Keefe, R.M.. and Yun, K. (2003). "The Growth of Broadband and Electronic Commerce in South Korea: Contributing Factors". *The Information Society* 19(1): 81-93.

Lee, H., and Choudrie, J. (2002). *Investigating Broadband Technology Deployment in South Korea,* Brunel University- DTI., London.

Lynch, I. (2001). **UK only eighth in e-government stakes.** http://www.pcmag.co.uk/News/1120293. April 9.

(MIC)., M. o. I. a. C. and (NCA)., N. C. A. 2002. '*Korea Internet white paper'*, Ministry of Information and Communication (MIC) and National Computerization Agency (NCA), Seoul, South Korea.

Ministry of Information and Communication (MIC) 2002. '*IT Korea 2002'*, Ministry of Information and Communication (MIC), Seoul, South Korea.

Neo, B., King, J. and Applegate, L. 1995. *'Singapore Trade Net (B): The tale continues (Case N9-191-136)'*, Harvard Business School, Boston,

Neo, B., King, J. and Applegate, L. 1993. *'Singapore Trade Net: Beyond TradeNet to the intelligent island. (Case 9-196-105)'*, Harvard Business School, Boston,

Northrup, T.A. and Thorson, S.J. (2003). *The Web of Governance and Democratic Accountability*. Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS).

ODPM (2001). National Statistics Online-Census 2001. Viewed on November 2003 at: http://www.statistics.gov.uk/census2001/

OECD 2003. '*Broadband access in OECD countries per 100 inhabitants, Sept.2002'*, OECD, Paris.

OECD 1997. '*Governmnet venture-capital for technology based firms'*, OECD (Organisation for Economic Co-operation and Development), Paris.

Oftel (2003). Oftel's Internet and Broadband Brief. September. Available at: http://www.oftel.gov.uk/publications/internet/internet_brief/broad1003.pdf. Viewed on October 21, 2003.

Press, L., Burkhart Grey, Foster, Will, Goodman, Sy, Tan, Alex, and Woodard Jon, (1998). An Internet Diffusion Study, On The Internet, Vol. 4, No. 4, July/August.

Rapp, J. 1996. 'Electronic commerce: a Washington Perspective' *In Readings in Electronic Commerce* (Ed, (Eds, Kalakota, R. and Whinston, A.) Addison-Wesley, Austin, Texas, 229-243.

Richardson, T. 2003. ‘Oftel redefines broadband’, http://www.theregister.co.uk (viewed October 15, 2003).

Rothwell, R. and Zegveld, W. 1981. *'Industrial innovation and public policy: Preparing for the 1980s and the 1990s',* Frances Pinter Publishers,

The White House 1999. '*Facilitating the growth of electronic commerce',* The White House, Washington.

Wax, R. H. (1986) The Ambiguities of Fieldwork, in *Contemporary Field Research”,* ed. Emerson, Boston, Little Brown, pp.194-95.

Yang, S. (2002) Korea boasts 10 mil. broadband users, Korea Herald, Viewed on November 7, 2002 at: www.koreaherald.co.kr

Yu, J. and Fang, X. (2005). The strategic roles of government in e-infrastructure development: case studies of China and Korea, *Electronic-Government: An International Journal*. 2, (2)pp. 177-187