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Jyoti Choudrie

Brunel University, jyoti.choudrie@brunel.ac.uk

Anastasia Papazafeueioulou

Brunel University, anastasia.papazafeiropoulou@brunel.ac.uk

Heejin Lee

University of Melbourne, heejin@staff.dis.unimelb.edu.au

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Applying stakeholder theory to analyse the diffusion of broadband in South Korea: the importance of the government's role

Jyoti Choudrie

Department of Information Systems and Computing
Brunel University
Uxbridge UB8 3PH
United Kingdom

Tel: 0044 1895 274000, Fax: 0044 1895 251686

Jyoti.choudrie@brunel.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

Heejin Lee

Department of Information Systems
The University of Melbourne
Victoria 3010
Australia

heejin@staff.dis.unimelb.edu.au

Abstract

Government has an imperative role in the diffusion of technology. In this paper we outline how this role is fulfilled utilising a theoretical perspective. The stakeholder theory analysis and the framework regarding innovation that has been developed by King et al support the theoretical view. The empirical evidence has been provided by the experiences of research that was conducted by observing, interviews and referring to archival documents upon a visit to country that is well ahead in its time in broadband diffusion and deployment. A total of 10 organisations that included facilities service providers, content providers, research institutions, think tanks and government departments were visited and intense 2 hours of interviews were undertaken. The conclusions to be drawn are initially that stakeholder analysis is particularly beneficial in identifying the levels of communities that will be affected by the deployment of broadband. Second, a government vision that can be supported and also carried forward by all the members of the country is particularly essential. There are other various factors also identified and described within this paper, but the one that stands out utmost is the government vision and its persuading powers.

Keywords

Broadband, stakeholder theory, South Korea, IT diffusion and adoption

1. Introduction

South Korea has the highest penetration of broadband in the world. To date, there are 10 million broadband users and the country has the highest broadband penetration in the world (Sung-jin, 2002). Most industry commentators expect the market for the current generation of broadband services (between 2 and 8 Mbps) to reach the saturation point by the second quarter of 2003 (Ministry of Information and Communication, 2002). In its Internet white paper ((MIC). & (NCA). 2002) the Korean Ministry of Information and Communication (MIC) set a new broadband objective for the provision of 20Mbps to the home consumers by 2005. Broadband services were first launched in July 1998 and the 1 million-user milestone was reached in April 2000. This marked the real take off point in the Korean broadband market with operators witnessing explosive growth in subscribers over the next two years (Sung-jin, 2002).

According to Lee and Choudrie (2002) the rapid roll-out and take up of broadband services in South Korea has been achieved through a combination of six key factors which are briefly described here. These factors were determined by speaking to the leading authorities in the Korean telecommunications market, the government, and content providers and referring to various archival documents and newspapers.

- Geography and demographics

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. According to the two largest network operators (KT and Hanaro) these housing patterns were critical to the success of their broadband strategies and they were doubtful that their business plans could be replicated in less densely populated countries such as the UK.

- Government vision, strategy, commitment

By having a clear vision and strategy, the government ensured a high degree of confidence and certainty for private sector companies. Although it is difficult to quantify the impact of the government's involvement, it seems very unlikely that South Korea would be the world's leading broadband nation without it.

- Facilities based competition

The Korean broadband access market is characterised by strong facilities based competition. KT, the incumbent operator, has approximately a 49% market share mainly based on DSL. KT's main competitors are Hanaro Telecom (26%) utilizing both DSL and cable networks, and Thrunet (17%) with cable networks. The fact that the landlord, not the incumbent, owns the block wiring in the apartment complexes eased the complexity of interconnection at the access level. The consequent absence of a local loop bottleneck has reduced the need for heavy regulation of the incumbent allowing KT to operate with comparatively few regulatory restrictions, compared to BT in the UK.

- The 'PC bang' phenomenon

The rapid emergence of more than 21,000 PC Bangs (PC rooms) between 1998 and 2001 was a major demand driver for broadband content and services in the early phase of broadband deployment. Similar in concept to Internet cafes, these privately run facilities provided the public with access to high capacity PCs and their first taste of the benefits of broadband.

The young people quickly adopted PC Bangs as they were viewed to be convenient, fun and fashionable places to play and to obtain the broadband habit. As the numbers of PC Bangs increased, they acted as a major catalyst to the market, and obtained thousands of new users. Crucially they provided the first commercial market for content developers, particularly the online games sector and provided a huge market stimulus for the residential take up of broadband. In so doing, the PC Bangs provided a solution in Korea to the 'Chicken and Egg' problem of how to stimulate user growth and the development of compelling content simultaneously.

- Price

The Korean government recognised that to be successful, broadband access would need to be priced at affordable levels for the middle income households. This was estimated to be approximately US\$30 per month. However, competition pushed prices lower and they have now stabilised at US\$25 per month for Broadband Lite (2 Mbps including modem rental) and US\$33 per month for Broadband Pro (8 Mbps including modem rental).

- Clear User benefits

Education and entertainment (particularly on-line games) are almost always mentioned by the users. By deliberately promoting the educational benefits of broadband, both the government and commercial players seized upon this 'education fever' as a means to drive demand. Other major benefits of broadband include access to information, financial transactions and viewing time-shifted TV content (e.g. soaps). The opportunity to participate to online communities also seem to be of increasing value to broadband users. This provides the opportunity to share interests in hobbies, games, sports, music, film, celebrities and even politics and 'do things that matter to me'.

The success story of South Korea is a useful example that can have implications for the information technology diffusion of other less or even more technologically advanced countries. The case demonstrates that government intervention is a very important element in the application of effective technology policies. Apart from the government a number of other private and public organisations played an important role in the process. Although the agendas of those stakeholders were diverse, they all contributed to the success story.

A note at this juncture is that when examining diffusion practices, an important factor to consider is culture. However, the intention of this paper is to examine the role of government in diffusing broadband and therefore this aspect has not been dealt with. The authors do acknowledge that this is an important angle to this topic, but have decided to concentrate upon that factor in the future.

In this paper we examine the role of the government in the diffusion of broadband in South Korea by analysing the diffusion policies followed in relation to specific groups of stakeholders in the market. Our aim is to get a better understanding of the information technology diffusion process and offer some recommendations for best practices in the development of national technology strategies. The supporting theoretical framework for our analysis consists of, as described in sections four and five, the stakeholder and innovation diffusion theories. The empirical evidence was collated by undertaking a field study of South Korea in July 2002.

2. Research Methodology

Previous research (Lee *et al.*, 2002) that suggested a successful penetration of broadband in South Korea utilised mainly secondary data to ascertain this issue. This research went a step further and used mainly primary data obtained from face to face interviews. 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. For the interviews, open-ended questions were utilised 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 organisations that were visited encompassed: government departments, research agencies, think tanks, on-line gaming companies, broadband facilities providers and entertainment centres. The selected candidates from the diverse organisations hailed from the managerial levels of the organisations and were usually involved in the formation of the pursued strategies. The government officials who were interviewed were also aware of the way that broadband was deployed and in certain instances were part of the policy making process. The interviews lasted for approximately 2 hours and were conducted using a set of pre-established open form questions.

A team of 8 individuals who were from various backgrounds conducted the interviews. There were technologists, academics and government department's representatives. This strategy was adopted to prevent a biased opinion to form and was also one of the pre-conditions of the organisation that co-sponsored the research trip. Subsequently it can be deduced from this research that various opinions emerge, but are of a more sound nature.

The paper presents part of the research findings is structured as follows. In section three we investigate how the South Korean government used existing intervention measures to apply its vision for a *Cyber Korea*. Section four introduces the stakeholder notion in the context of national broadband diffusion strategies and identifies the groups of stakeholders acting in the Korean market. In section five we draw a web of strategies and stakeholders in order to describe the impact of the technology diffusion strategies of the Korean government on key stakeholder groups. The paper concludes with implications for policy makers at government level concerning technology diffusion strategies.

3. The role of the government 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 & 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 is an agreement

in the literature about the vital role of public administration in the diffusion of new technologies (e.g. (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; Ministry of Information and Communication (MIC), 2002; The White House, 1999)).

Seeing the broadband technology as a technological innovation that has the potential to revolutionise the use of the Internet by small companies and individuals, in the next section we describe strategies and measures commonly used by national governments in the diffusion of such technologies. Additionally we examine how the South Korean government acted as a powerful entity that applied these strategies and speeded up the adoption of broadband in the society.

King et al. (1994) 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 intervention 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 Innovation directive I	Knowledge deployment Subsidy Mobilization 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)

4. Diffusion strategies followed by the Korean government

Using the framework described in the previous section we examine how the Korean government 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.

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 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.

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 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).

Innovation directives 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.

For this purpose, the 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 government can in turn convince them about the potential of broadband.

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 South 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.

Examining the policy measures followed by the Korean government the role of other stakeholders was manifested making the investigation of their involvement in the success story an interesting research subject. In the next section we demonstrate how we used a framework developed by (Papazafeiropoulou & Pouloudi, 2000) in order to identify the key stakeholders and their roles and relationships in the broadband market in south Korea.

5. Key stakeholders in the diffusion of the broadband technology in South Korea

Papazafeiropoulou & Pouloudi (2000) synthesise innovation diffusion (e.g. (King et al., 1994; King & Kraemer, 1995) (Rogers, 1995)) and stakeholder theories (see (Freeman, 1984; Mitroff, 1983); (Pouloudi, 1999)) in order to examine the role of national governments in the diffusion of electronic commerce. The authors argue that is important for governments to have a holistic view of the stakeholders acting in the market. In this way they can be sensitive to the specific needs of different interest groups, be more effective in the application of their strategies and act proactively in a rapid technologically changing environment.

In this section of the paper, the framework that is developed to investigate the diffusion of broadband and consists of an important element of electronic commerce infrastructure is applied to the Korean telecommunications market. Therefore, one of the foremost tasks is to identify the key stakeholders in the Internet Korean market. By undertaking this action, the aim is to draw the web of the government strategies described in section 3 and the groups of stakeholders involved in the process of broadband diffusion with the view to get a clear picture of the process.

- *The government*

The Korean government has played a key role in the development and implementation of a detailed and sophisticated strategy for broadband deployment, focusing on both supply and demand side issues.

In 1995 the MIC set out a vision for the transformation of South Korea into a knowledge-based economy where there would be 'one PC for everyone'. This vision accompanied the development of the first Korea Information Infrastructure (KII) action plan in 1995, which quickly recognised the scale of the required financial investment and the need to motivate operators, including the incumbent.

Rather than knock this strategy off track, the financial crisis of 1997 reinforced the government's commitment to transforming the Korean economy as an exit to get out of this

crisis. Consequently, connectivity and informatisation were made a top priority. For this purpose, since the beginning of KII, public investment has been made particularly for the backbone infrastructure (see 3.1.2 Harnessing network).

There is much discussion on the government role in deploying broadband access. The debate gets fierce particularly when it comes to the issue of spending public money. One view is that the government direct investment is a key factor in the Korean story. However, on the other side the opinion is that the government has adopted the role of a team player and therefore, it cannot be the main reason for success. The judgement on this opinion still remains open. However, it was found that government investment certainly played a role; that of a catalyst, which induced private companies to follow by ensuring the industry of the government commitment. This offered the industry confidence and reduced the uncertainty involved in such a big investment project.

Crucially, not only helping build the network infrastructure, this strategy also provided demand side stimulants with the promotion of the educational benefits in a society gripped by 'education fever', and was one of the major drivers of consumer demand for broadband.

Following the explosive growth of broadband uptake in the last two years, the government policy is now focused on the digital divide issues, with government funding being targeted towards extending coverage to rural areas and ensuring digital inclusion.

By setting out a clear vision and strategy, the government ensured a high degree of confidence and certainty for private sector companies. Although it is difficult to quantify the impact of the government's involvement, it seems very unlikely that South Korea would have been the world's leading broadband nation without it.

- *International organisations.*

As a result of the financial crisis of 1997, the Korean economy suffered tremendous losses. However, the government was intent upon building and emphasising the Korean economy's potential. For this purpose, financial support was required and this was obtained from international organisations such as the International Monetary Fund (IMF). Obtaining large sums of money allowed the government in turn to offer monetary support to the facilities providers. This was in the form of soft loans that were afforded to the providers.

- *Consumers or citizens*

Education is viewed to be the key to social mobility and financial success and Koreans are used to spending significant amounts of their disposable income on educational resources, including tutoring and materials for their children. By deliberately promoting the educational benefits of broadband, both government and commercial players seized upon this 'education fever' as a means to drive demand.

Meanwhile, the growing strength of the Korean on-line gaming market meant that children and teenagers had their own strong motivations – beyond their educational requirements – to encourage their parents to provide them with PCs and broadband access at home.

It is also often remarked that Koreans in general are very open to new technology and tend to be rapid adopters of new and innovative products. The strongly homogenous Korean culture may account for some consumer herding characteristics and also seems to have led to the rapid development of strong online communities based around the personal interests of users in areas as diverse as on-line games, music, sport and even politics. There are growing examples of participation in such on-line groups spilling over into the real 'offline' world.

When asked, Koreans do not hesitate to explain the benefit and value they gain from broadband. To them the benefits are clear and obvious. The ‘killer combination’ of education and entertainment (particularly on-line games) is almost always referred to by the users. Other major benefits include access to information, financial transactions and viewing time-shifted TV content (e.g. soaps). Free Voice over IP was also identified as an initial benefit although this no longer seems to be a strong driver.

The opportunity to participate and belong to online communities of interest also seems to be of increasing value to broadband users. That is, the opportunity to share interests in hobbies, games, sports, music, film, celebrities and even politics and ‘doing things that matter to me’.

- *Companies.*

Broadband has helped to facilitate continued growth in electronic commerce. In particular there has been very high take-up of on-line banking and other financial transactions. Online stock trading witnessed sustained growth throughout the period of broadband diffusion. In July 2001, the ratio of online stock trading to the total trading accounted for 66.4%; it was 3.7% in December 1998 (Korea Securities Dealers Association, 2001). The number of online securities accounts has also risen considerably. In July 2001 there were more than 4 million online accounts, and over half of them were securities accounts. Internet banking is another area that has seen a huge growth. The number of internet banking users was 11.3 million in December 2001. This was a 2.8 times increase from 4.1 million at the end of 2000 (Bank of Korea, 2002). In terms of the percentage of users among the total population, Korea is 24.2% with only two countries ahead (Sweden, 29.4%; Norway, 28%). It seems partly due to the fact that transactions have been made easier and faster by broadband and are therefore much more attractive to users.

The on-line gaming and entertainment sector has been another major beneficiary of the deployment of broadband. South Korea is now home to some of the world’s leading on-line games companies. Strong competition in this sector has driven innovation in both products and business models and several of these companies are now focused on exporting their products, skills and expertise overseas.

- *Change agents*

We use the term *change agents* (Rogers, 1995) or *policy intermediaries* (Papazafeiropoulou et al., 2001) for those organisations that act between government and companies or citizens.

It is often argued that healthy competition between both infrastructure networks and within each network technology (e.g. ADSL) plays a pivotal role in the deployment of broadband Internet (OECD, 2001). In Korea there was, and is, vigorous infrastructure competition within and between ADSL and cable modem networks. The Korean broadband access market is characterised by strong facilities based competition in which seven companies compete.

When KT dominated the voice market, new entrants focused on data services for their market entry strategies. New entrants were able to gain market access initially by leasing network capacity from Powercomm. Hanaro added its own DSL networks to the HFC networks leased from Powercomm. Hanaro’s total Capex amounted to approximately US\$4 billion. Thrunet and Hanaro were the first companies to offer broadband services based on cable networks from Powercomm and the DSL network of Hanaro. This move caused KT, which had been debating the merits of ISDN, to follow with the launch of its own DSL services. New entrants were able to gain rapid subscriber growth by targeting large multi-dwelling apartment complexes and other high-density areas.

The fact that the landlord, not the incumbent, owns the block wiring in the apartment complexes eased the complexity of interconnection at the access level. In the absence of a local loop bottleneck, all operators have benefited from a very light touch regulatory regime that has placed relatively few restrictions on the actions of the incumbent.

Apart from the key players in the electronic commerce market, other entities can play a supportive role in the implementation of a national strategy. The traditional *media* (press, radio, and television) for example can influence at a great scale the consumers about the use of new technologies and promote the opportunities of the new medium to companies and individuals. Additionally, it is imperative for governments to include *politicians* across the national ideological spectrum in the decision-making procedures about national strategies.

Referring to the daily newspapers published in Korea, it can be noted that the status of Internet use, its potential and broadband are regularly described. For instance at the time of the writing of this paper, newspapers had emphasised the development of e-government in Korea and the potential that it afforded. Therefore, by publicising this development the opportunities afforded by the innovation are described.

6. Application of government strategies to specific groups of stakeholders

Figure 2 depicts the web of the groups of stakeholders in the broadband market in South Korea with the strategies the governments has used to influence the beneficiaries of the service (companies or individuals). The numbers represent the six strategies in the following order: (1) Knowledge building (2) Knowledge deployment (3) Subsidy (4) Mobilisation (5) Innovation directive (6) Regulation setting.

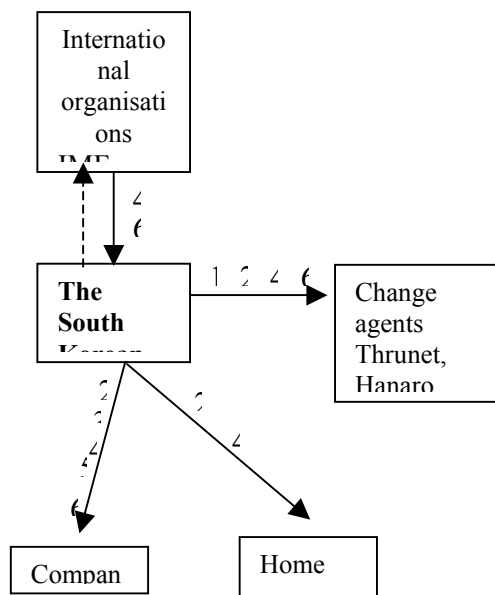


Figure 2: Impact of national electronic commerce strategies on the key stakeholder groups

In the following paragraphs we describe the relationship of the Korean government with each of the other stakeholder groups through the glass of the strategies followed in each one. We believe that this way we can draw a clear picture of the process followed in the Korean case and consequently describe some implications for broadband strategies in other countries.

Government-International organisations. The international organisations have been a factor leading to the deployment of broadband. Since monetary amounts were obtained from them, the government could in turn ensure that the vision that it had developed could be obtained. Although the providers and government agencies were quick to state that the amounts afforded to the providers were of miniscule amounts, they were still viewed to have made an impact and therefore it is difficult to discount these organisations.

Government-change agents. By offering financial incentives, the government promoted a supportive role. This in turn also made other providers consider entering the market for providing the facilities required for broadband. Further by pursuing a light regulatory touch the government avoided having the providers complaining that certain providers were doing better than them.

Government-Companies. The government was keen to recover from the financial crisis of 1997 and foresaw broadband as being an enabler at recovering from that. Therefore, companies that used broadband in various ways, for instance, content (video-on-demand and online gaming) delivery were encouraged and also allowed to grow.

Government-home-users. By deploying various programs that could demonstrate and also allow the users to become acquainted with the new technology the government formed a relationship with the users. Further by allowing the users to become familiar to the technology in their familiar territories the government expanded the provision of the technology. Also the government understood the requirements of the users and by achieving this, ensured that the technology was provided to satisfy them

7. Policy implications-Conclusions

The rapid deployment and adoption of broadband services in Korea has resulted due to a number of factors and has been driven by multiple players. Some of the factors are intended or unintended. Moreover, many of the factors that have contributed to the Korean success are specific to the country. These include high population densities, high prioritization of education, the strong role of government in industrial policy and so on. The South Korean model does not therefore provide a blueprint for a broadband strategy that could be implemented in the every country. Nevertheless, there are a number of implications that can be drawn from the experience in South Korea.

First, 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. The government did not seek a detailed economic case to justify its policies and investment. Instead 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 South 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.

Supply and demand forces work together in the adoption and diffusion process of IT innovations. A demand-focused approach is often 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.

The Korean case also 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 MIC 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. As broadband deployment in most counties today is demand constrained as well as supply constrained, the search for cultural sensitivity on the needs among users is worth attending to, for promotional purposes.

In line with the above approach, education can be a leverage for broadband. With the proper support, training and resources, broadband can help to transform the learning and teaching environment for students and teachers alike. Exposure to the fast speed and rich content of broadband at school can encourage students to become supporters of broadband at home as those who are used to broadband connections at school will soon become impatient with the narrowband connections at home. Therefore work needs to be done to accelerate the provision of broadband to all points of learning and support the development of an online digital curriculum. This will help to drive the residential demand for broadband.

Rights issues also need to be considered. For example, easy use of the repeat content by a Korean broadcaster has made viable its interactive and multimedia business on the Internet. The development of effective micro payment options has been essential for the content sector. The ability to make diminutive payments for content encourages users to make ‘impulsive’ purchases of content, such as games and video. Currently, the most frequently used and preferred method of payment in Korea is via the mobile phone bill.

Commenting upon the theoretical perspective, it can be seen that stakeholder analysis is a most beneficial tool in this paper as it assists individuals in identifying what levels of communities, research organisations and government departments can be affected by various actions that are undertaken within a country. While empirical evidence provides a rich picture, on its own it is difficult to understand and by applying a framework such as the stakeholder one, a clearer and concise picture can emerge.

However, whilst a theoretical and holistic overview of the diffusion of broadband can be offered by the stakeholder analysis, another important theoretical perspective can be offered by undertaking a cultural comparison. For instance, can the characteristics, such as high individual actions versus collective actions evident in certain cultures (Hofstede, 1986) also explain why and how South Korea obtained tremendous success in this area. This is an avenue that particularly interests the authors and is one that they intend to research into greater depth in the future.

8. References

- DTI. (1998). Net Benefit: The Electronic Commerce Agenda for the UK, forwarded by Barbara Roche. DTI.
- Freeman, C. (1998). Japan: A new national system of innovation? In *Technical change and economic theory* (Dosi, G., Freeman, C., Nelson, R. & Soete, L., eds.). Pinter Publishers, New York.
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*, Ballinger, Cambridge, Mass.
- Hofstede G (1986) Cultural Differences in Teaching and Learning, *International Journal of Intercultural Relations*. 10. 301-320.
- 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.
- King, J. & Kraemer, K. (1995). Information infrastructure, national policy, and global competitiveness. *Information Infrastructure and Policy* 4, 5-28.
- Lee, H. and Choudrie, J. (2002) Investigating broadband technology deployment in South Korea. Brunel university, DTI: International Technology Service
- Ministry of Information and Communication (MIC) and National Computerization Agency (NCA). (2002). Korea Internet white paper. (MIC)., M. o. I. a. C. & (NCA)., N. C. A.
- Ministry of Information and Communication (MIC). (2002). IT Korea 2002. Ministry of Information and Communication (MIC).
- Mitroff, I. (1983). *Stakeholders of the Organisational Mind: Toward a New View of Organisational Policy Making*, Jossey-Bass, London.
- Neo, B., King, J. & Applegate, L. (1995). *Singapore Trade Net (B): The tale continues (Case N9-191-136)*, Harvard Business School, Boston.
- OECD (Organisation for Economic Co-operation and Development). (1997). Government venture-capital for technology based firms. OECD.
- Papazafeiropoulou, A. & Pouloudi, A. (2000). *8th European Conference on Information Systems (ECIS 2000), 3-5 July, Vienna, Austria*.
- Papazafeiropoulou, A., Pouloudi, A. & Currie, W. (2001). *Hawaii International Conference on Systems Sciences (HICSS-34), 3-6 January, Maui, Hawaii*.
- Pouloudi, A. (1999). *Thirtieth-second Hawaii International Conference on Systems Sciences (HICSS-32), 5-8 January, Maui, Hawaii*.
- Rapp, J. (1996). Electronic commerce: a Washington Perspective. In *Readings in Electronic Commerce* (Kalakota, R. & Whinston, A., eds.), pp. 229-243. Addison-Wesley, Austin, Texas.
- Rogers, E. M. (1995). *Diffusion of innovations*, Free Press, New York.
- Rothwell, R. & Zegveld, W. (1981). *Industrial innovation and public policy: Preparing for the 1980s and the 1990s*, Frances Pinter Publishers.
- Sung-jin, K. (2002). "Half of Korea's Top 10 Export Items Changed in 2 Decades". *Korea Times*, August 25.
- The White House. (1999). Facilitating the growth of electronic commerce. The White House. 29th November 1999.