The innovation adoption process for broadband services

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Abstract

The broadband services are becoming widespread, after becoming a trendy of-the-shelf product that everybody can easily acquire. Yet, they have the power to transform the everyday operation of an organisation, an aspect often underestimated, while they are acknowledged by the EU Commission as a key factor for the knowledge diffusion towards the transformation of the EU society to the society of knowledge. In this study we will examine the broadband services from a different perspective, as an innovation under adoption, and we will try to describe this innovation process and the problems that may arise during this process.

Keywords: Broadband, Innovation adoption

1. Introduction

The telecommunications and more specifically the broadband services have been early acknowledged early by the European Union as a key factor for the transformation of the European society to a society of knowledge, in order for EU to become capable to compete in innovation production with the two other major economies, USA and Japan. In fact, during the Lisbon Summit, in June 2000 (see COM (2000) 567), broadband services had been identified as the mean to interconnect all the citizens of Europe and provide them with access to the knowledge centres. To this end, the Commission of the European Communities proposed and the member states have adopted, a series of actions under the general title eEurope 2005 and the its revision under the title i2010.

By broadband connection we define the always on connection to the Internet with speed of at least 144kbps, according to the communication of Commission of the European Communities COM(2004) 369 final, and the study of the Observatory for the Information Society in July 2005. The broadband services is a more general

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definition, as in includes not only the connection but also the Internet related services that usually accompany, or can be ofered only through a broadband Internet connection.

Additionally, the broadband services are an innovation that can be adopted and integrated to an organisation's everyday operation, resulting in small or big transformations within the organization, according on the organisation's general attitude towards technology. Thus, the above mentioned strategic importance of broadband services to the European economic evolution necessitates the identification of the process that an organisation needs to follow in order to successfully integrate the broadband services to its day-to-day business, and the problems that may arise during this innovation adoption process.

The structure of this study is as follows. In the next section, we will examine the close relation between the organizational change process and the innovation adoption procedure proposing an innovation adoption process. In Section 3, after a brief definition of what is broadband, we will refer to the results of the qualitative research conducted, in order to examine whether the Greek companies do follow the proposed innovation adoption procedure for the introduction of broadband service to their operation and we will close with the problems that these companies encountered during this introduction of the broadband services.

2. Innovation adoption as an organisational change

Each organization during its lifetime has to face multiple challenges both by its outside environment, ie. competition, social changes, new innovations, and by its internal environment, that is its employees.

In order to cope with these challenges, the organisation needs to develop unique capabilities, its core competences that could give competitive advantage, and in the same time create an internal culture of change in order to enhance these core competencies and adopt itself to the changing challenges of the external environment. The viability of the organisation depends on the speed and effectiveness of change implementation. The speed of change implementation is further enhanced by adopting innovations, instead of creating them internally. Thus, the innovation adoption procedure becomes a crucial parameter for the fast adaptation of the organisation to its environment. [Cooper (1998)], [Christensen at all (2003)], [Σπανός 2005].

However, it is understood that the failure of the innovation adoption process may present a potential danger for the organisation, as the same happens in the case of failure of the change process, as it will undermine the organisation's efforts to gain competitive advantages against competition. Moreover, the sunk costs related to the failed process will endanger the economic viability of the organisation.

This innovation adoption procedure becomes additionally more important as it tends to become a central issue of the EU policy in order to prevail in the competition between the other economic powers.

As already mentioned, the innovation adoption by itself is a change within the organization. According to its intensity, i.e. if it is radical or incremental, it can lead correspondingly to bigger or smaller organizational changes. Thus in order to ain a better understanding of the innovation adoption process, it is useful to mention the best practices for the organisational change process. Among the bibliography the best description of the change process is given by ***J. Kotter*** [Kotter (1995)], and it entails the following steps:

1. *Create a sense of urgency*
   Every organisation must examine the market and competition in order to identify when it must take action in order to stay ahead of the competition. Unfortunately many organisations fail to identify the urgency of adopting to the continuous competition.
2. *Form a Powerful Guiding Coalition*
   No change has a chance of implementing unless it has support by individuals with great influence within the organisation. Additionally it is imperative that those that support the change must learn to work as a team.
3. *Create a Vision*
   In order achieve wide support of the change effort, a vision must be formed, and moreover, the guiding coalition must form strategies to implement the Vision.
4. *Communicate the Vision*
   This Vision and the related strategies must reach every worker in every possible way.
5. *Empowering others to act on the Vision*
   Te guiding coalition must get rid already in the early steps of the change, of any obstacles that can be formed. Moreover it must encourage the organisation to take the risk to implement the new ideas of the change
6. *Planning for and creating Short-Term Wins*
   It is imperative for the mass of the employees to feel with visible results that the change, even during the first implementation steps does have positive results. Only then there is a chance that the employees will embrace the change and become more devoted to the success of the change
7. *Consolidate Improvements and Produce still more change*
   The early improvements will make the entire organisation more receptive to additional changes. In this stage the increased credibility can help change systems, structures policies that do not fit anymore to the vision. Additionally the

organisation will need to hire, or promote employees that are devoted to the change

8. *Institutionalise new approaches*
   The results of the change are visible and become a part of the everyday operation of the organisation. However the organisation must keep the culture of change and start to work towards the new changes that the environment dictates.

Several models have been proposed for the innovation adoption procedure, viewing it as a subset of the change process mentioned above [Rogers (1995)], [Σπανός 2005], or purely as a knowledge diffusion process [Gopalakrishnan at All (2001)]. According to the author, the innovation adoption procedure is both an organisational change, as it demands adaptations to the operation or even structure of the organisation, and a knowledge diffusion procedure, as the adoption of an innovation entails the acquisition of new knowledge to the adopting organisation. Hence, the proposed innovation adoption model can be viewed as a five phases procedure, and provides an improvement of the Rogers model by additionally incorporating the dimension of the knowledge diffusion. As it is not aimed for a specific industry, it is acknowledged that it is rather generic, though it would not be possible to become more specific without loosing its ability of application to a wide range of organisations. The five phases are as follows:

1. *Problem definition.*
   In this first stage the organization identifies the problems, realises their severity and the gap between its knowledge and the knowledge needed to resolve these problems. The organisation also must define in this stage the ways that it can close the knowledge gap, either through its own recourses or through external help (eg. hiring external consultants). In this stage the organisation must create the sense of emergency and form the guiding coalition to implement the project of innovation adoption.

2. *Innovations - solutions evaluation and decision*
   The guiding coalition must evaluate the proposed innovations in terms of: *competitive advantage* that give to the organisation, *compatibility* with the organisation's operation and systems, *complexity* that affects the adoption cost, *trialability* so that the innovation can be tested prior to its adoption and finally *observability*, in the sense that both the innovation's operation and its results must be observable otherwise there is a danger of not using the adopted innovation. The decision must come out not as a compromise, but the innovation must persuade at least the guiding coalition that it can resolve the problems. Otherwise it will be impossible to form a Vision, according to Kotter and communicate this Vision to the employees.

3. *Implementation - adaptation of the innovation to the organisation*

Both the innovation and the organisation are adapted as a result of the new knowledge that the organisation acquires, and its willingness to reavaluate its operation to a wider perspective than the direct operation affected by the innovation.

4. *Innovation diffusion*
   The innovation is already used by the majority of the employees. In this stage it is imperative for the organisation to design carefully the training program of the employees so that they are persuaded of the usefulness of the adopted innovation, and see the results in their everyday work. The problems that arise during the early stages of the innovation's mass usage must be resolved very fast so that they don't form a negative opinion against the innovation

5. *Institutionalisation*
   The innovation is fully integrated into the organisation's systems. Though, depending on the extent of the organisation's adaptations, it may still be possible to abandon the innovation. To prevent this, the organisation must reinforce the training programs so that the knowledge diffusion becomes a continuous process inside the organisation.

3. Innovation adoption process of the broadband services

Since, as mentioned in the Introduction hereinabove, the broadband services are a major innovation with crucial importance towards the knowledge society, it is interesting to examine whether the Greek companies see the introduction of broadband services as an innovation adoption procedure, thus paying increased attention to the broadband services integration with their everyday operation.

To achieve this, the author conducted a number of case studies on the business customer base of Forthnet, one of the leading Broadband Service Providers in Greece, regarding the introduction of one particular broadband application, the implementation of Virtual Private Network (VPN). The VPN is a private Data Network between 2 or more points, implemented over a public Network (such as the ADSL network of and ISP) and allows a company to communicate in real time and with high security with its subsidiaries. As a result of this implementation, many adopting companies actually change the way of operation, as the change from non real time, to real time update of the accounting and logistics systems may require not only changes to the work methods but even organisational changes.

The companies that were examined ranged from small family owned businesses, to big chains with more than 200 branches each. Their main areas of activity were the transportation sector (car rental, shipping and airways companies), and the retail sector (clothing industry). None of the examined companies had as core business the IT nor the production of innovative technological products. Accordingly, most of the

businesses did not have an R&D department Thus, the process of innovation adoption is a crucial parameter for their survivability, as it is the only way of acquiring innovation and strengthen their competitive position. Therefore it is important to follow a structured innovation adoption process in order to be able to control the spread on the innovation among the organisation and exploit the most of the adopted innovations.

Although more than 50 companies were examined, the findings cannot be generalised to all the companies of the Greek market but can form a base for a quantitive research to verify these findings.

The research included:

a. observation of some key factors, such as the structure of the company, the decision maker of the introduction of broadband services, which was identified easily by the power of the person who conducted the negotiations with the service providers,

b. communication with the IT department in order to answer questions about the relative works conducted in parallel with the introduction of broadband services, the problems encountered during the implementation phase, the problems with employee education, the methods used in order to resolve the implementation phase problems, the support and generally the quality of service received by the Service Provider and the time needed in order to perform the introduction of the broadband services.

From the findings of the research regarding the innovation adoption procedure of the broadband services seems that the five step procedure in on general being followed, though with differences between the companies, due to the size of them and to the existence of and IT department. More specifically in each step we have observed the following:

1. Problem Definition: Most big size companies have an IT department. These companies, and especially the companies in the transportation industry, did define accurately their problems and put form the beginning of the innovation adoption process specific goals and time plans. Most SMEs that relied on external IT support, did not however define the problem correctly, which resulted to problems during the implementation phase.

2. The evaluation and decision about the Service Provider, is a formal procedure in the big companies and comes often as a result of a "Request For Proposal - RFP". In the smaller companies the Service Provider and the proposed solution is decided by the personal relations of the owner or the IT responsible. This entails the risk of not choosing the best proposition. Indeed in some cases the companies were forced to change the ISP as the initial solution did not resolve their problems.

3. In many cases the introduction of the broadband services, must be followed by organisational changes, since they can radically alter the way a company operates (eg. introduction of an on-line, real time billing system). Unfortunately many small companies tend to underestimate the importance of changes and go directly to the fifth step, i.e the institutionalisation of the use of broadband services. It has been observed however than in most big chains the introduction of the broadband services is a part of a wider technological upgrade. In some cases, i.e. big chains in the retail industry, the introduction of the broadband services was a result of a big organizational change regarding the supply chain control. Thus, the implementation phase came in parallel with the organisational change, allowing the easier adaptation of the internal processes to the capabilities of the broadband services.
4. The stage of the innovation diffusion is very often omitted in the smaller companies due to their size. Unfortunately in about half of big companies this stage is also omitted, as there is no attempt for training the employees in using the new technology. Thus the employees are obliged to start using the new technology and systems with no prior training and no knowledge about what actions to take in case of a problem. In these cases the Service Provider often assume the role of training the employees through the troubleshooting procedures.
5. The last step, the institutionalisation of the adopted innovation is rather an automatic procedure by all the companies. In the case of the broadband services, it is almost impossible to stop using them once they have integrated in the everyday work of the organisation.

4. Problems during the integration of broadband services

In spite the importance of the broadband services for the EU economy, the procedure of their integration with each organisation's operation has not given much attention by the Greek state. This fact, together with the general problematic situation of the Greek telecom market, has caused many problems, especially to the early adopters of the broadband services, despite the fact that more or less the innovation adoption procedure is being followed by the majority of the companies. The research identified the major problems that the companies faced, as follows:

1. A considerable number of companies did not have knowledge regarding the broadband services, and unfortunately they did not asked for external help in order to adopt the broadband services smoothly. As a result they failed to correctly identify their problems. This, in turn, was a root of serious problems encountered during the implementation phase as the companies did not expect to perform any kind of adaptation to their systems.

2. In most of the SMEs in the Greek market, the founder-owner plays a pivotal role in all crucial matters, including the decisions about the technologies to be implemented and the partners chosen, and they have at most an internal IT responsible employee. It was observed that in the companies that the owner was technology friendly, the company could identify correctly its problems and perform the necessary adaptations to its systems during the implementation of the VPNs.

3. Although most of the Geek companies have an internet connection, as the recent statistics by the Observatory for the Information Society show (Observatory 2006), a significant number of SMEs that their owners are not technology literate, are at least reluctant towards the introduction of more sophisticated broadband services as VPNs. Those companies, when they need to deploy such services, often due to competition pressures, rely heavily on external partners. The observations show that even today, most of the external partners, which are IT shops and integrators, are still not literate about advanced broadband services.

4. The early deployments of VPNs, suffered from problems regarding the immaturity of the innovation under adoption, and also from immaturity of the Service Providers (SPs) regarding their ability to transfer know-how to their customers. As the time past this problems were eliminated since the technology itself matured and the SPs accepted, as their experience became wider, a *defacto* role of both providing the Service and also consulting their customers regarding the implementation issues of the broadband services

5. The Greek State programs do not treat the broadband services as an innovation to be adopted by the companies but merely as a product that the company will buy form a Service Provider. Thus, most of the Greek state programs, mainly under the EU founding, are aimed to help the SMEs just to purchase internet connections, instead of trying to help the companies develop a friendly attitude towards technology. As a result, indeed the Greek companies have by 97% Internet connections, services like e-shops or even VPNs are still in early penetration stages.

6. Unfortunately, the broadband connections, that is the ADSL connections, is promoted by the ISPs as a mass market product for fast Internet connection without promoting the usefulness of the adoption of such services by the business customers. The ISPs consider as business products only the very expensive leased line connections, thus failing to provide the SMEs with economic, though powerful and very useful, ADSL related products.

7. Finally, especially in the Greek market, the language is still a barrier for the adoption of Internet. As the language of the PC and Internet world is, by vast majority, the English, any Greeks are afraid to access the Internet due to their poor knowledge of the English language. Although the Greek content is

becoming spread, it still lacks the variety and the usefulness that can attract the masses. It is expected however that this will change, as the State pusses the business customers to start using only the Internet for the transaction with many organisations, and as initiatives like the e-ΚΕΠ will become reality.

5. Conclusions

While the broadband services are one of the means for EU and Greece to achieve the target of the Knowledge Society, this initial study showed that in Greece it seems that the adoption process of the broadband services, especially in the SMEs, has not been given careful consideration.

We believe that our results can form the base for a considerable wider research in order to define general problems of the innovation adoption process and subsequently help the State to design more effective initiatives towards the education regarding the innovation diffusion.

While the initiatives of the 3rd EU support programme have already reached their end, the fact that Greece has the smallest penetration of broadband services among EU and the wide gap that still exists between the current state and the targets of the Lisbon summit, make the reconsideration and perhaps the reorientation of the State initiatives towards the innovation diffusion a highly urgent matter.

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