Company characteristics and consumer preferences - prerequisites for adopting decisions involving organizations in green ICT innovation

Laura-Diana Radu

Alexandru Ioan Cuza University from Iasi

1 October 2012

COMPANY CHARACTERISTICS AND CONSUMER PREFERENCES - PREREQUISITES FOR ADOPTING DECISIONS INVOLVING ORGANIZATIONS IN GREEN ICT INNOVATION

Abstract

This paper deals with the influence of the companies' characteristics and the implicit or explicit consumers' preferences for the environmentally-friendly ICT products. The interest of organisations in the innovation of green ICTs is conditioned by a range of subjective or objective factors, prevalently of financial as well as social nature. Beyond the financial aspect aiming at increasing incomes either through the products/services provided that do not affect the environment or through the reduction of expenses as a result of the use of alternative resources against the traditional ones, the ecologic innovations have various premises being conditioned by a series of internal or external factors. The characteristics of the organisation, the consumers' behaviour, the amount of investments in research and development, the existence of leaders' vision and the competition are only some of the motivations and triggers of the innovative process with a varied weight in the strategic decisions of organisations. This paper studies only the first two premises. The green ICT is an important direction for technological innovation aspect reflected in their place in the concerns of the international organizations like Organisation for Economic Co-operation and Development or World Economic Forum, but in the literature also. The research methods were observation and analysis in this study that reflects the intersection of three economic areas, important for research: management, eco-innovation and ICT.

Keywords: green ICTs, companies' characteristics, consumer's preference, technological innovation, environment.

Introduction

The implication of individuals, organisations and nations in the innovative process is conditioned by a series of social, cultural and economic factors that may stimulate or limit the initiatives. The financial and intellectual efforts are entirely justified if we think that innovation creates the premises for the economic welfare, for the improvement of life standards and the creation of new jobs; therefore it represents the sap of global economy and a strategic preoccupation for almost any manager of each and every company in the world. (Dayer, Gregersen & Christensen, 2011, p. 1)

The capacity of a country of being more innovative than another has historic roots, it resides in its citizens' personality, in its more tumultuous or more peaceful past, in the ability of its regulatory bodies to encourage through political mechanisms and financial incentives its involvement in the innovative process. We support our previous statement through the presence of Switzerland, Sweden and Denmark in the top of the most innovative countries that preferred to keep their neutrality in some of the great conflicts among states or the case of the USA on whose territory there have not been such conflicts. At the opposite side there are the hard tried countries, such as Israel, Japan, Germany, Taiwan, and Finland where the population had to adjust to the unfavourable life conditions imposed either by historical factors or natural ones. We notice their ability to focus on the economic and social evolution, which is impossible to achieve without innovation and/or its adoption. We also believe that the economic and social evolution determined the increase in complexity of the innovation concept, the identification of successful ideas being more difficult to identify as well as their implementation in a global, extremely diversified market. Under these circumstances, the orientation towards green technologies is not only a necessity from an environmental perspective, but also an opportunity for organisations to create new

products/services due to the continuous increase of consumers' awareness in relation to the human ecosystem.

The Role of Companies' Characteristics and the Interest in Environment in Technological Innovation

An important aspect in technological innovation is the companies' organization, the way in which they support or not the innovative spirit through internal rules and regulations as well as the existence of qualified persons or the capacity to attract them. Literature identified some features of an innovative organization like vision, favourable structure, key employees, team, and strong involvement in innovation, creative environment, communication, continuous training and learning organisation. (Tidd, Bessant & Pavitt, 2005, p. 469, Popescul, 2012)

We also consider as important for innovation, the organisation's availability and capacity of not restraining the employees as far as time and tasks are concerned. These attitudes are promoted in the ICT companies which either try to ensure their employees at the workplace the material and moral comfort to develop the activity in a relaxed atmosphere, mixing their personal likings with the work tasks, or they grant a high degree of flexibility to the program. A form of this application can be found under the name of entrepreneurship where companies encourage their employees to behave as entrepreneurs, even if in a corporate environment. (Gallo, 2011, p. 65) An example is represented by the Google company which encourages its engineers to use 20% of their working time for activities they are really interested in. "The break for innovation" is a deep-rooted idea of the company being used both to attract new employees and to develop products/services, leading to the implementation of successful services with direct or indirect impact on environment, such as Gmail, Google News, Google Suggest, AdSense. The Google managers believe that around 50% of the company's inventions may be attributed to this method. (Gallo, 2011, p. 65) The ICT companies are nevertheless recognised for their flexible working program, the work efficiency being determined mainly by the amount, quality and time period allocated to the task fulfilment.

It is important for organisations that managers adopt a pro-innovation rational attitude and encourage those features that foster the innovative processes such as: asking questions that may lead to the identification of problems and opportunities, acquiring new skills, taking risks and pro-activity, synchronizing personal values with the organisation's values and scopes. (Frohman, 1999, p. 32) The idea that, in such an uncertain and complex approach as innovation the chance plays an important role is also accepted. (Leuca, 2008, p. 26) Even if there are circumstances when success is accidental, which is more and more unlikely due to the spectacular technological evolution where even the big companies face survival and market-leading problems and the lack of access to the necessary infrastructure makes the approach rather difficult, the value is provided by the ability to reiterate success as a proof of the skills to assimilate such actions, to repeat and learn from the experience they offer. We think that in the present context of ICT evolution, the innovations in this field are directly and irrefutably related to the access to financial resources. A proof in this respect is that most of smaller or greater ideas that became internationally recognised and popular innovations were born in the Silicon Valley.

As regards the green side of the ICT field, the direct and indirect involvement in the protection measures of the environment is important for the organisation and for the initiative success. To this aim, the companies must develop policies promoting the environment importance and inject in the employees favourable attitudes towards its protection. The types of involvement of both the organisation and its employees in the pro-environment measures are diverse and so is the way of conceiving their actions in the light of the effects on the ecosystem. The internal regulations, the organisation attitude, the involvement in the environmental protection campaigns may lead to the increase in employees' interest. The concept, known as the environmental management system and regulated by the ISO 14000 standards, is adopted by many companies and international

institutions aiming at the rational use of natural, economic and human resources in order to protect and improve the environment.

As for the ICT companies, the interest in the development of products favourable to the human ecosystem is continuously increasing, which is proved by the successive attempts to be in line with the international standards, by the perseverant promotion of environmental coordinates within different campaigns and by the involvement in voluntary actions run to the same goals. The image they offer to the consumers, related to environment protection, has become essential for the success of products/services. In this respect, the Green Peace global organisation has made several versions of a rating of the greenest ICT companies according to the pro-environment solutions they had identified and developed, to the energy consumption and carbon emissions as well as to the environmental policy. (Green Peace, 2011) Unfortunately, in 2012, the organisation emphasized a reduction in efforts for the environment protection, the companies receiving a lower score than in the previous two studies. Thus, if in 2010 the maximum score was 62, respectively 70 points obtained by Cisco, in 2012 Google, placed the first, obtained only 53 points out of 100. Google, Cisco and Dell are different from the rest because each of them uses for the infrastructure 20% of reusable energy. (Green Peace, 2010, 2011) The greatest efforts in the development of technologies which reduced carbon emissions belong to Cisco, Ericsson and Fujitsu. The results of the last three ratings conducted by Green Peace reveal significant changes of position among companies, the disappearance of some and the appearance of others, as well as their increase in number, which proves an increase in the interest in environment and the competition among firms. We also notice the weak presence of Europe, with only 5 companies out of 21, all of them in the field of mobile phones (Nokia – Finland which has though disappeared from the last rating, Alcatel-Lucent – France, Telefonica – Spain, Vodafone – Great Britain, Ericsson – Sweden, of which only Ericsson is present in all ratings), in comparison with India that has three companies in the top (Wipro, HCL and TCS), as well as the obvious dominance of USA and Japan. Green Peace, 2010, 2011)

The innovation at country, company or individual level, implies the existence and nurture of certain features as well as the access to information and knowledge. For the economic organisations, the legal and economic framework is essential in order to favour or limit the technological innovation, aspect which is even more important in the case of green ICTs since these imply total or partial replacement of some equipment or applications with less harmful ones for the environment or with ones that support its protection. The involvement of companies is different from one country to another; it is more intense in the developed ones and more timid in the developing or the poorly developed ones. It is also difficult to perform green ICTs in Europe as long as its representation on the technological world map is rather weak in comparison with the main competitors, such as USA, Japan and even Korea. Under these circumstances, we believe as more important the adoption of innovations that fulfil in a cumulative manner the environmental conditions against the real innovation in the EU countries as well as in other areas where the ICT production does not get the upper hand, having an important role in regulating the offer through demand.

The Influence of Consumers' Preferences and Attitude in the Technological Innovation

As it is well known, the evolution of demand represents an important premise for the companies' drive towards a certain product, service, and production process or organisation method. If we have in view the significant social impact of green ICTs, we think that the consumers' involvement is relevant for the orientation of companies towards pro-environmental policies. According to the Green Factor study conducted by Strategic Oxygen, GCI Group and Cohn & Wolfe, in 2008, the ICT clients are interested in buying green products against the traditional ones, even despite the higher costs (Strategic Oxygen, GCI Group, Cohn & Wolfe, 2008). The study addressed over 3,500 persons responsible with the procurement of ICT products from companies

in 11 countries, respectively Japan, USA, India, Canada, Australia, Germany, Great Britain, Brazil, Mexico, France and Italy. The most important conclusion, relevant for this section of our paper, is that over 70% of the respondents would be eager to buy green ICT products if they were certain about the positive impact on environment costs (Strategic Oxygen, GCI Group, Cohn & Wolfe, 2008), even if 60% of them expect prices to be higher for these products.

We consider the results of the study fairly optimistic even if it was conducted before 2009, the year when the green concept was overhyped among consumers and governmental organisations. We can identify at least a weak point in the absence among respondents of the ICT representatives of the European northern countries, such as Sweden, Norway and Finland, where the principles and pro-environment rules are rooted in the inhabitants' behaviour and lifestyle and regulated by rigorous laws. We also observe the absence of China where this field is in full expansion, with major influences on the market and wrongly applied environmental laws as well as the absence of some poorly developed countries, such as Pakistan, Vietnam, Philippines, Malaysia, Nigeria, Peru and Ghana considered, alongside China and India, as the biggest e-waste importers. We identify a contrasting vision about India, which, on one hand, is an important candidate for green ICT products, according to the previously presented study, and on the other hand it is known for its flexibility as regards e-waste imports.

In 2011, another study involving 9,000 respondents in Australia, Brazil, China, France, Germany, and India, USA and Great Britain and analysing the consumers' behaviour towards the green products from all fields and conducted by Cohn & Wolfe, Landor Associates and Penn, Schoen & Berland, highlights an increase in the interest in this respect. (Cohn & Wolfe, Landor Associates and Penn, Schoen & Berland, 2011) According to the data provided, 60% of the participants want to buy from the companies interested in environment. The respondents from all the countries analysed are inclined to pay more for ecological products, especially in the developing countries. The main categories of products they plan to purchase are from the technology and auto industries. Another remarkable aspect, highlighted by this study, is that, in all the countries, except USA, the consumers believe that the essential role in supporting the ecological innovations is held by the state, against the private sector. As for the image of ICT companies, they are perceived by consumers as being barely interested in environment, in light of the products offered, according to the ratings undertaken by the same study. We also notice from this study as well as from the Green Peace study results regarding the "greenest" ICT companies, the consumers' subjective perception in relation to the real interest in environment of the companies in this field: only one company can be found in both ratings, namely Microsoft (we took into consideration the hierarchy made by Green Peace in April 2010 which is the closest one to the time of the survey performed by Cohn & Wolfe, Landor Associates and Penn, Schoen & Berland).

As it can be observed, the information provided by the research in this field about the population's interest in environmental issues, as consumers, varies a lot, including by groups of products. On a whole, there is an interest and it is still growing, but it is negatively affected by the insufficient promotion of favourable features for the ecosystem. At the same time, the lack of some spectacular results in the area of environment protection limits the companies specialised in product promotion (for example, the significant beneficial results in the reduction of energy consumption are promoted by all ICT producers – and not only – fact that shaped the consumers' opinion regarding the effects on environment and oriented their preferences towards certain products against others).

Considering the assiduous promotion of the pro-environment attitude by the international institutions, the mediatisation of green ICT benefits and their introduction in most of the developing projects at regional and global level, we think, in the light of what has been presented in this section of the paper, that the interest in such products has significantly grown in the last years, driving the preoccupations of the producers. Unfortunately, for at least a part of the mankind, and here we refer to the poorly developed and developing countries, the access to ICT is

not very well shaped so as to ensure rational consumption. The life standard does not allow the inhabitants of those countries to select their equipment by environmental reasons, fact that is not at all stimulating for the companies activating in this field. Other consumers' features that de-motivate innovation and the drive towards environmentally-friendly technologies are lack of education, inexistent or deficiently applied regulations, lack of social awareness in the environmental protection, exaggerated promotion of consumption, lack of a clear delimitation between the favourable and unfavourable environmental elements, the mediatisation of products through costs and less through their consequences on the human ecosystem.

Conclusions

The features of the knowledge society, influenced by the technological evolution, have determined significant mutations in the actions, character and interests of individuals, organisations and international institutions. The important differences between the life standards and the level of civilization have not been eliminated yet, determining major behavioural disparities in relation to the economic and social evolution. Even under these conditions, the preoccupations for the natural environment are a major coordinate of short or long-term plans. The way economic organisations react to environmental problems and the eagerness to get involved in solving them are influenced by certain subjective and objective factors; we attempted to present in this paper some of the essential ones.

The technological innovation in the ICT field has proved to be very important in the context where the good functioning of the society relies on its components. Unfortunately, the concept green ICTs is not yet a priority for all organisations. There are multiple ideas, statements, but few implementations with a rather reduced impact in comparison with the negative effects of the often excessive and unjustified use of equipment and applications. We believe that the path of this field will be considerably influenced in the following stage by the availability and interest to find the balance between environment and innovation, by the drive to the identification of the best solutions to develop the activity in agreement with the human ecosystem.

The technological innovation is the result of a multitude of factors, difficult to explain in an exhaustive manner, the most important ones being the financial motivation reflected in various forms, the attraction of new customers or the adjustment to the changes in their demands, the taking over of the market, the cost reduction etc. On the other hand, the increase in interest in the environment makes the companies direct their actions of innovation or adoption, to a smaller or greater extent, towards the products/services/production methods/organisation with minimum negative impact on the ecosystem. The R&D investments, the vision, the organisation features, the consumers' attitude and preferences, the competition are not the only premises for innovation. A significant role is held by factors such as innate intelligence and education, culture, availability to take risks difficult to evaluate and quantify. The state and international organisations may influence the interest in the innovative process by granting funds and setting regulations as well as by ensuring flexible modalities to impel organisations.

At the ICT level, Europe, as all the studies reflect, is much advanced by other countries where this field is an essential component of the national economy. This aspect has important influences on the speed with which ecological innovations will spread. It is natural that the first implementations should be performed in the origin countries that will also enjoy the benefits brought to environment. For instance, the first centres fuelled with renewable energy as well as the migration towards cloud computing are designed for the USA. For the time being, the European organisations get prevalently involved as ICT consumers, role which cannot be neglected, still less important than that of the developers.

Another critical aspect related to ICTs is the lack of some real data of the effects of their production and use on the environment. There are rough, approximate information, but the

companies do not want to provide exact data about the size of the negative effects on the environment under the form of the effective energy consumption, emissions of toxic gases or waste generated, due to the image they would offer to the consumers and even to the possible legal conflicts they would cause. Even if the innovations in the ICT field could not compensate the negative effects generated by the environment, we believe that it is essential to become aware of this problem and of the occurrence of this concept for the future evolution of this ever growing industry.

Acknowledgment

This work was supported by CNCSIS-UEFISCSU, project number PN II-RU code 188/2010.

References

Dayer, J., Gregersen, H. and Christensen, C., (2011), *The Innovator's DNA. Mastering the Five Skills of Disruptive Innovators*, Harvard Business Review Press, Boston, Massachusetts.

Tidd, J., Bessant, J. and Pavitt, K., (2005), *Managing Innovation. Integrating Technological, Market and Organizational Change*, 3rd Edition, John Wiley & Sons, Ltd., Chichester.

Gallo, C., (2011), *The Innovation Secrets of Steve Jobs: Insanely Different Principles for Breakthrough Success*, Curtea Veche, București.

Frohman, A., (1999), *Personal initiative sparks innovation*, Research Technology Management, Vol. 3, No. 43, 32-38.

Leuca, T., (2008), *Innovation and Technology*, University of Oradea, Faculty of Electric Engineering and information Technology.

Green Peace, (2011), *Cool IT Leaderboard. Version 5: february 2011*, [Retrieved May 22, 2012], http://www.greenpeace.org/international/Global/international/publications/climate/2012/CoolIT/Leaderboard5/Cool%20IT%20v-5.full%20report.pdf.

Green Peace, (2010), *Cool IT Leaderboard. Version 3: april 2010*, [Retrieved May 22, 2012], http://www.greenpeace.org/international/Global/international/publications/climate/2010/Cool%20IT%20V3%20full%20report%282%29.pdf.

Green Peace, (2010), *Cool IT Leaderboard. Version 4: december 2010*, [Retrieved May 22, 2012], http://www.greenpeace.org/austria/Global/austria/dokumente/Reports/konsum_CoolIT_v4_201012.pdf.

Strategic Oxygen, GCI Group, Cohn & Wolfe, (2008), *Green Factor*, [Retrieved 29 November 2011], http://www.greenfactorstudy.com.

Cohn & Wolfe, Landor Associates and Penn, Schoen & Berland, (2011), *The 2011 Green Brands survey*, [Retrieved 21 March 2012], http://www.cohnwolfe.com/en/ideas-insights/white-papers/green-brands-survey-2011.

Popescul, D. (2012), *Barriers and Solutions in the Knowledge Flow Percolation Model*, in „The USV Annals of Economics and Public Administration", vol. 12, issue 1(15), Suceava