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**Master Thesis:**

**“Internet Diffusion in the Republic of Serbia”**

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## **1. Introduction**

Consequences of the discontinuity of modernization waves in Serbia that have happened so far have important effects to ICT development and Internet diffusion in Serbia today. Social forces neglecting the attempts and efforts to get out of the vicious circle that Serbia today participates in have the same terminology and form as one or two centuries ago. They are in the shape of overemphasized traditionalism which is an obstacle when it comes to applying something new, be it new pattern of living or new technology model. In order to reach the post-industrial society standards and eventually the ones that consider Information Society as well, Serbia should start with an adequate innovation implementation in all aspects of the social, political, economic and cultural life. The increasing technological gap that exists in between Western countries and Serbia today also exists in between most of the other transition and developing countries, on the one hand, and developed Western countries, on the other hand. This gap is closely related to the global as well as 'local' digital divide that Serbia confronts and because of that this country needs to reach the next step in Internet diffusion. In order to show how this can be done, this text will present theoretical models that can help Serbia finding a way and reaching the higher extent of Internet diffusion.

### **1.1. Presentation of the Problem and Research Questions**

According to Internet World Stats News for the second quarter of 2007, number of Internet users in Europe is estimated to be 321,853,477, and Internet penetration rate is 39.8%. The results of the research, that included 52 European countries and regions, show that Serbia occupies 49<sup>th</sup> place on the list, as per the penetration rate (13.9%). On the other hand, according to the national statistics, the results regarding the research about the use of Internet and e-Government services are the following: in Serbia 26.3% of households have access to Internet; the broadband Internet connection is used by 7.3% of households in Serbia. Broadband allows faster Internet connection speed, and besides that is one of the main indicators of the ICT use development, used in European Union since 2005 (percentage of the households that own this kind of connection). As for e-Government services, they are used by only 230.000 individuals in Serbia (the overall population in 2002 census in Serbia was 7,498,000<sup>1</sup>). Only 3.8% of Serbian citizens own a laptop; and 74.9% of citizens with an income bigger than 600EUR (with an average month salary of 300EUR) and 20.5% with only half of that income own a computer (2007). In last quarter of the year 2007, 29.9% of Serbian citizens used a computer for some purpose; 65.4% of Serbian citizens have never used a computer. The average of the sophistication of e-Government services

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<sup>1</sup> Excluding Kosovo and Metohija, the territory under the interim administration of the United Nations, UNMIK (Security Council Resolution 1244; 1999)

in the Republic of Serbia is 38%, while the average for the EU countries is 76%. Web presentations of public institutions and local governments are not in accordance with standards and technological solutions which enable the offering of quality information, especially offering of interactive electronic services to citizens, businesses and to the other public institutions and organizations interested. The analysis of the web presentations has shown their diversity in structure, as well as in the content. Seeing that the web page construction is gaining more and more importance and having in mind that there is no standardized approach to it in Serbia, there is a need for the research to assess what the challenges are, and conducive as well as inhibitive factors when it comes to the Internet diffusion, ICT use, and furthermore the adoption of electronic services in Serbia. Furthermore, there is a global tendency that something needs to be done in order to prevent differences between one social group (“haves”) in using predominantly potentials and capacities of ICTs and the other social group (“have-nots”) that is left without benefits that ICTs can provide. Therefore, this research is primarily about Internet diffusion and diffusion factors in Serbia, as well as about ICT’s challenges that Serbia confronts today. After introducing the problem, in order to go further in the introduction and respectively to the theoretical framework, the methodology and the empirical part of the thesis, I will introduce the research questions:

#### Central Research Question

What are the reasons that Serbia lags behind in terms of Internet diffusion and ICT infrastructure compared to almost all other European countries and what can and should the Serbian Government do to address this issue?

#### Research Sub-questions

- 1) Why is it important for a transition country to have a well functioning ICT infrastructure and high internet penetration?
- 2) What are the main things governments of transition countries need to do to promote ICT and internet penetration?
- 3) How can we establish what the Serbian Government is doing at this moment?
- 4) To what extent does the Serbian government express awareness of the importance of ICT development?
- 5) To what extent does the Serbian government address important diffusion factors concerning individual users?
- 6) To what extent does the Serbian government address questions of national ICT infrastructure?
- 7) How do the activities of the Serbian government in this respect compare to the activities by other governments of similar countries?

Since the research questions are presented, I will go further in the explanations about each of them and about the chapters and sections where they will be analyzed respectively.

In the second chapter, literature on Information Society, Knowledge Society and Networked Society is analyzed. We will see in this chapter why it is important for a country to have developed perception and implementation of Information Society concepts in its public policies, as well in its follow-up actions. Furthermore, we will realize why well-functioning ICT infrastructure and high level of Internet diffusion is of essential relevance when it comes to the introduction of the Information Society in a post-socialist and post-industrial environment given what Serbian institutions have stated in policy documents that this country wants to achieve.

In the third chapter, the text consist of the next parts: firstly, I introduce the Innovation Diffusion theories, models and patterns given the fact that ICTs and Internet are innovations in the Serbian society; secondly, I present the Technology Diffusion theories, as well as one specific model called Technology Acceptance Model, and finally, I go into the Internet Diffusion theories and Digital Divide concepts as some of the most important challenges connected to the ICT infrastructure and Internet diffusion in modern societies. Additionally, I analyze the theory and empirical generalizations made by Piatkowski about transition countries in which he shows what transition countries should do in order to promote ICTs and Internet diffusion. I examine the benefits of introducing and having gradually higher degree of ICTs in post-socialist and transition countries that have joined EU. This can reflect the situation in which Serbia is today on its way to joining EU, especially after recent ratification of the Stabilization and Association Agreement (SAA) as a part of the Stabilization and Association Process (SAP). By analyzing these theories I will come to the conclusions what the main actions are that the Serbian governments needs to take in order to promote better quality of ICT infrastructure and higher level of Internet diffusion.

In the fourth chapter, I present the methodology of the research conducted in this thesis. I will discuss the reasons why certain methods and models are used. Moreover, I analyze and propose the ways of how to discover what the Serbian Government does when it comes to the ICT infrastructure and Internet diffusion. After that, I present the conceptualization of the empirical part, the parts that the empirical chapter consists of and the line of reasoning taken according to the theoretical framework that will be provided as well. Once the methodology approach and research strategy and design are explained, I will go forward to the empirical part.

In the fifth chapter, section one; I will start with presenting the results of the empirical research I have conducted. This chapter consists of the investigations and the results which will point out the ways in which the Serbian Government shows the awareness of the importance of ICT development. I analyze the most important policy documents of the Serbian Government and other institutions, and terms and concepts of how Information Society is developed and implemented through these documents and follow-up actions. The institutions which documents I have used are: the Serbian Government, the Parliament of the Republic of Serbia, Ministry of Telecommunication and the Information Society of the Republic of Serbia, The National

Information Technology and Internet Agency, the Telecommunication Agency, and the Statistical Office of the Republic of Serbia.

In the fifth chapter, section two; I will present the empirical results based on the part of the theoretical framework that deals with the individual users, their perceptions, needs and skills necessary for the dispersion of the Internet in Serbia. Since certain skills and knowledge are needed on behalf of the potential adopters of the Internet in one country, the Government needs to fulfill the condition which considers individual Internet users on the territory of that country. Without adopter's ability to adopt certain technological innovation, or without knowledge that is required to use that innovation further on, there cannot be successful policy documents that will implement the Information Society or any innovation in the scope of measures needed for this general concept to be introduced. Given what said here, I will test certain theories and models from the theoretical framework in order to check what the awareness of the Serbian Government is and how far it goes when it comes to addressing the Internet diffusion factors regarding individual users in this country.

In the fifth chapter, section three; the present situation of Information Society development in Serbia particularly in terms of national ICT infrastructural context is given. One of the points that I will put emphasis on is the aspect of how the Serbian Government addresses the question of national ICT infrastructure. According to the given authors in the theoretical part I will compare these definitions of the IS and ICT terms and concepts to what policy documents and analyses of the Serbian Government indicate.

Finally, in the last section of the fifth chapter, I will compare the activities of the Serbian Government with the activities of the other transition governments, in particular the governments of the countries that have joined EU recently, in the last four years. Through this I will provide the summary of answers to the research sub-questions based on which the answer to the central research question will be given. Moreover, the final conclusions and recommendations for the case of Serbia will be drawn.

Before going further into the theoretical framework, I will refer shortly to some of the historical tendencies that have existed in Serbia, and which have been related to the fact that Serbia is a country in the post-social transformation processes with political scene that has started being developed only two decades ago in a modern, pluralistic way. I will also refer to the Serbian political elite and actors, and analysis that have been made about dominant political values and orientations in order to find out what social, economic, political and cultural conditions are present in Serbia and to see in which context Internet diffusion happens. Since it can be inferred that the political scene and actors, and dominant social values is not the topic of this paper they will be put aside after the introduction. In the theoretical part, as well as later in the empirical part, I will be dealing with the conditions in which Information Society is being or should be

developed in one country, but also with the social and infrastructural conditions needed in Serbia to fulfill all the requirements to have higher level of Internet diffusion than what is the case right now. In specific sections in the theoretical framework I will explain why the higher level of Internet diffusion is needed ('Digital divide', section 3.3.1.). Therefore, as I have already noted that it will be given as part of introduction; important historical tendencies in Serbia for the last two centuries are going to be observed here.

In the previous two hundred years, traditionalist and modernization streams in Serbian society have had clashes over all the European or world modernization influences that had tendencies to penetrate inside the borders of Serbia. In the second part of the 19<sup>th</sup> century, after reaching its status as a State, Serbia had problems with its own social complexity that emerged in a new fashion now. The first modernization wave corresponded to building a railway network in the 19<sup>th</sup> century, and this is one of the first processes in Serbia after setting itself free from Ottoman Empire's authority when different social streams could actually be confronted among themselves and over something different than what is called the common enemy. Members of different social streams could have taken stand of one of the three present positions when it comes to the innovation implementation such as building the railways. The first position was approving the modernization without too many doubts or criticisms. Therefore, this orientation opted for applying what was considered 'modern' in its own country whatever this could be *without* adaptations whatsoever, and to an extent that is present in other 'modernized' countries, and all this to be applied as fast and thorough as possible. These were mostly the members of liberal political option in Serbia. The second position preferred a compromise and an effort to apply modernization effects *jointly* with what was perceived as a basic and dominant social values and institutions in a sense of a national culture. This orientation was opted by middle-aged liberals, first socialists and radicals in Serbia. The third position represented a total dissatisfaction with what was perceived as a 'modern' change *in* or *of* the society, and instead keeping the vision of intact continuity with its own tradition in order to maintain the societal 'survival'. The clash between liberals and radicals over the process of building the railways was clash between two value systems, modern and traditional one. So, it is obvious that after a few centuries of Ottoman Empire's authority and finally Serbians winning the autonomy in 1830, as well as reaching the de facto independence at the Congress of Berlin in 1878, some of the basic conditions for the modernization were established in a sense of having a bit differentiated social and political positions with possibility to organize themselves and fight for one or the other political option. Based on these observations of different social streams in Serbian past, one should know that traditionalism and conservatism were well integrated and coherent in the past centuries in this country. The second modernization wave happened inside the Kingdom of Serbs, Croats and Slovenes, few years after the First World War and went on until the beginning of the Second World War. Inside the socialist model after the WW II the third modernization wave had happened, while the fourth wave has occurred as a process of post-socialist transformation in which Serbia is still today. All the modernization waves were often interrupted by wars, political



turmoil, and other disruptions so modernization track could not have chances for building its continuity. As I have already mentioned, the first modernization wave happened as a process of introducing the first railways, also factories, but as well as the emerging of the middle-class citizenry and labor class. What was modernized in this age were primarily public institutions. The second wave happened during the Great Depression in 1930, and mines and refineries were introduced in Serbia. Once reached the power, Communist party after the WW II declared that industrialization and electrification would be the main strategic goals of the country. In this wave one of the technological innovations was a television which was introduced in 1938 in Serbia. As it was already mentioned modernization process presents much wider frame than what we see today happening in Serbia. Today it is the post-socialist transformation that has the main effects in this country. According to various authors, 1990s were a decade of “blocked transformation” in Serbia, and most of the authors see year 2000 as a cornerstone when new modernization wave has been introduced. The greatest modernization effects that Serbia had gained in the period from 1960 to 1990 were to a certain extent reversed by the fact what happened in the Balkans and inside Serbia in particular in the last decade of the 20<sup>th</sup> century (wars in the region; one of the highest inflation rates in European history, NATO bombings in 1999, etc.).

Serbia today is on its way to joining EU. There are formal declarations and actions from both EU and Serbia confirming the determination of both parties to have an agreement that can reach the mutual satisfaction. This is introduced through Association Agreements in the course of the Stabilization and Association Process (SAP) which EU typically concludes in exchange for commitments to political, economic, trade, or human rights reform in a country that is a potential member-state. In this way – by joining EU – Serbia will get access to the close cooperation with all the other EU countries. Primarily this means cooperation with those countries that have gone further in modernization processes and in the Internet diffusion in particular, and in this way building a sound foundation and impetus to the modernization processes inside the country.

## **2. Society and Technology**

In order to find out what the adequate solutions for increasing the Internet diffusion level in Serbia are, we need to refer to the terms which describe and explain the main concepts and models for developing the Information Society. The research task in this paper is to find out why is it important for a country, in this case – transition country, to have a well functioning ICT infrastructure and high Internet diffusion level. Related to this is to answer to a question how Information Society concepts and definitions can help us understand what the best environment is in which ICTs and Internet can spread and become the foundation of the social, political, economic and cultural life of the citizens of one transition country.

Therefore, concepts and definitions of Information Society, Knowledge Society, and Network Society (which are basically intertwined) are going to be described and explained in the first part of theoretical framework because they can help us finding out how Information Society functions and how Serbian institutions should function if they want to improve the Internet diffusion level. This is important in order to find out what the most appropriate alternative is for the situation in which Serbia is today. This is because Serbia today has one of the lowest rates (13.9%) of Internet diffusion in Europe (49<sup>th</sup> place out of 52 countries and regions) and by the level of e-Government development is only in the introduction stage which is one of the lowest in the region of the Balkans, let alone Europe. Also the fact that Serbia wants to join EU which member-states has established certain standards when it comes to IS and ICTs will be taken into account.

Thus, in this chapter theories and models on Information Society, Knowledge Society and Network Society will be presented so that we can assess the awareness of the Serbian Government when it comes to the ICT development. Important policy documents (i.e. strategies) will be analyzed afterwards in a way that it will be checked how do the terms and concepts that are about to be presented in this chapter correspond to what has been written in the Serbian policy documents.

### **2.1. Information Society, Knowledge Society and Network Society**

#### Information Society

The basic principles of the Information society are defined in numerous aspects of modern society and these principles are usually the focus of the academic analysis and discussion presented in this paper. In this section there is an analysis about how the development of the

ICTs and Internet as the infrastructure of the Information Society should be built and prospered around these basic principles.

In the 1960's, as Fleissner and Hofkirchner put it, a few social scientists began to feel a deeply rooted change in society. These two authors argue that it is not quite clear who was first; whether it was the Japanese Tadao Umesao in 1963, or Alain Touraine in 1972, who published a vision of a new kind of society, *the Information society*. Both Touraine, and later on Daniel Bell (Bell, 1973), according to Fleissner and Hofkirchner, avoided the term 'Information society', but called the society 'post-industrial'. Nevertheless, Daniel Bell later indicated the main changes and tendencies about post-industrial society which are presented in Figure 1. They are formulated like this: a trend away from the primary and secondary sectors towards the service sector; increased importance of scientific work, research and development; a transformation of work from manual workers towards 'brain workers'. Information and knowledge became as important in production as capital, labor, and land. Figure 1 therefore summarizes the main factors and changes in Information Society as one of the most well-known authors on modern society detected them.





Industrial society	Transition	Information Society
Primary and Secondary Sectors		Service Sectors
Manual Work		Scientific Work; Research and Development
Manual Workers		Brain Workers
Capital, Labor and Land		Information and Knowledge; Capital, Labor and Land

Figure 1. Changes in post-industrial society (Bell, 1973)

As for the Internet, it has become a new common platform for communication in the 1990s. Furthermore, there was no effective way for governments to limit the Internet once it was there. An individual, household, company or state administration is either online or offline; and being online is equivalent to having an access to the entire cyberspace. ICTs, and especially Internet development, led to the changes that one can notice in every-day life, and particularly in economy, politics, and culture. The global society in which we live today is being designated as Information Society by numerous authors, but also as Knowledge society and Networked society (Castells 1996, 2000; Drucker 1993; Bell 1999; Hayek 2005; Webster 1995, 1999; etc.).

Although each and every one of these concepts means something distinct from one another, all of them still have one thing in common and that is, according to the abovementioned authors, emphasizing the ICT use and its influence on modern society. Some of the authors agree that, on the one hand, technology is the one which dictates how society is being developed, and on the other hand, building these technologies is provided only by firm social activities with which they can produce and/or develop those innovations. That means that Information Society points to the economic aspect of society, but also to the certain system of values. Almost all authors agree that economic progress of Information Society is based on ICT use in every societal segment, and production and distribution of information is the most common social, economic, or cultural business.

ICT's influence has become one of the most powerful in the contemporary world when it comes to transforming all the social activities. There are authors who argue that in the ways that railways and electrification revolutionized 19<sup>th</sup> and 20<sup>th</sup> century respectively, telecommunication infrastructure has done the same in the 21<sup>st</sup> century. By using ICTs nearly whole human kind is being networked, and membership in this network is almost not of a free choice anymore. Government's failure to provide its own citizens with the adequate telecommunication infrastructure and Information Society in whole – would mean for that country loss of huge benefits, but also a total isolation and loss of potential progress that could have been made. This is going to be shown in detail in the particular section where I analyze Piatkowski's empirical research about transition countries that joined EU. Important to notice here is that, on the one hand, ICTs are huge opportunities for all the countries, especially for not that wealthy ones – for the reason of decreasing the difference in the development level between them and wealthier ones – but on the other hand, there is also a danger that this gap can be increased. Some authors argue that the poorer countries and regions, due to a lack of awareness about the significance of investing into ICTs and knowledge, remain undeveloped and poor, while other wealthy countries, due to a very fast development and technologies' employment are becoming even wealthier than they used to be. Therefore, according to these authors, developmental gap is consequently increasing.

The Information Society has also a huge importance for EU governments and because of that there is a constant activity on working in this direction, creating a framework and regulations for building an infrastructure and providing services, stimulating technology researches and applications, raising awareness of IS relevance, as well as following indicators on how to improve ICT application in society, economy and culture. That means that all the member-states, as well as countries striving to join EU such as Serbia, need to follow the guidelines given in the EU policy documents.

When Rule and Besen (2008) tried to designate what Information Society is about, they referred to “the rise of cyberspace; the role of science and technology in creating new products and

services; the use of social and economic indicators to guide government and private-sector policy; and the role of scientific thinking in setting countless other directions in human affairs”. The same authors, in treating the notion of a rising Information society as an empirically-relevant model, came up with certain conclusions. They argue that classic IS idea consists of “a series of interrelated characterizations of relations between knowledge and information, on the one hand, and key social processes” (Rule et al., 2008). Relevant aspect is that these authors mentioned that ideas that IS consists of are far from new in a sense that they date back all the way to the Enlightenment thinking of Saint Simon and Comte. Rule and Besen argue that Saint Simon and Comte saw themselves at the forefront of an entirely new social hierarchy – one based on authoritative information or knowledge. They argue that Saint Simon’s model of large-scale social change turned on the role of knowledge and information. According to them, Comte’s idea was about the concept that “the rise of science was evolving into a new positivist religion that would eclipse the authority of both church and state”. These ideas, they argue further, “exerted great influence in late twentieth-century IS thinking, as did a number of other key elements of Saint Simon’s and Comte’s thinking” (Rule, Besen, 2008).

In this paragraph I explain how these two authors (Rule and Besen) summarized the over-all vision of the Information Society. Firstly, they said that history proceeds through stages, and that each stage is shaped by a distinctive social force or principle. They think that recently we have entered a new era distinguished by the changed roles played by information and knowledge in social and economic life. Secondly, they argued that a basic feature of this new order is that larger proportions both of populations involve purposeful use of authoritative information or knowledge. For this reason, information and knowledge matter more than before in setting directions of human conduct. Thirdly, their standpoint is also that in this new social order, information and the ability to use it appropriately becomes the source of great value. Inputs of knowledge and information play a crucial role in fostering productivity and economic growth. Finally, they argue that perhaps the most consequential feature of the new order is change in all kinds of authority and direction-setting in public affairs. In the Information society, exercise of power increasingly requires justification through authoritative information and, because of that, structures and processes involving authority, from those of the state to those in private-sector organizations, are being deeply changed. This paragraph is very important in order to understand tendencies in the modern world and to see what is relevant to comprehend in creating and implementing public policies that consider Information Society, Internet diffusion and electronic services that emerge from it.

Therefore, as a conclusion to this section I can say that there are global tendencies that all countries in the world need to pay attention to because of the fact that they all belong to the one, global market and “village” (Lewis, 1948). Those tendencies can be described also by the notion of Information Society, although some other authors might call it in different ways. The important thing is that they all have something in common and that I want to detect these things

that are mutual to them in order to answer the research questions of this thesis. Transition countries and ruling elites in these countries need to know what the conditions of creating this new type of society are if these countries want to be competitive on the world market. Today, according to the mentioned authors, competitiveness means well-functioning market, also well-tailored, organized and *networked* institutions, which can be described in the concept of e-Government. Furthermore, competitiveness would also mean putting an emphasis on stimulating and creating digital literacy and, accordingly, decreasing the digital divide in wide population of society by higher rate of Internet diffusion. The concepts that go along with the IS concept are necessary to be discovered and implemented in policy documents, and in reality too, if consistency in principles – that Serbian Government already put forward – want to be achieved. Given the fact that the basic definitions related to IS are mentioned in the previous paragraphs we can go on to next concept, I would argue – the concept very much connected to the IS – and that is Knowledge Society.

### Knowledge Society

In the last few centuries there have been fundamental societal and economic transformations, and each of these transformations has had fundamental consequences for the society. There is no doubt at all that the information and communication technology revolution has changed drastically the role of the knowledge in the economy. It has given worldwide access to all types of information. It has provided also the new tools for managing the information, as well as for advancing the knowledge creation. But the consequences of the wider use of information and communication technology are much more complex. One of these consequences is the speed up in the rate of change that brings us into ‘a learning economy’ where the capability to learn becomes more important than any given sets of specific capabilities (Lundvall, 2006).

As for the knowledge society, this concept is being used when there is a talk about society that uses, distributes and produces knowledge. Knowledge about how to be more competitive; as well as production, use, and dissemination of information is a key to success, and that means the key answer to the mystery of how to reach sustainable economic and social progress. Development and use of knowledge, as well as living in knowledge society is therefore the interest of the global society, and ICT use and Information or Postindustrial Society or Knowledge society offers huge developing potentials. The industrial revolution put the cornerstone of the transformation of the economy from agriculture to industry. The scientific revolution of the past century has resulted in the systematization of change itself (Stiglitz, 1999). The knowledge is different from other goods because it has many of the central properties of a public good, actually of a global public good (Stiglitz, 1999). So, the focus used to be on the "weighty economy", as Stiglitz likes to express it as a metaphor, and now the knowledge is the basis for

the "weightless economy." Namely, nowadays the economic development is being discussed more like education in the sense that covers knowledge, institutions, and culture. The reasons for this way of seeing the economic development was partially motivated by the experience of the most successful countries. What is important is that government has tremendous, central role in creating knowledge economy, the role in creating institutions and rules to support and grow this kind of economy. Although implementing a new technology and a new way of thinking and producing is very often the case in knowledge economy, implementing a new technology in a different environment is itself a creative act, not just a copied behavior (Stiglitz, 1999). Very important to mention is that the shift towards a knowledge-based economy involves a shift in organization away from top-down hierarchical structures to flatter structures such as networks (Stiglitz, 1999). Here we come to the term called "networked society".

To refer to East Asia, the key factor to Japan's economic development was the opening to foreign knowledge after the Second World War. According to Stiglitz (1999), society needs to experiment if it wants to strengthen and speed up its own modernization drive. Experimentation requires openness to new knowledge and to change, and change can always be unwelcome to the powers that be (Stiglitz, 1999). According to Stiglitz, pluralism, competition and openness are of great importance for innovation and the growth of knowledge. All of these changes in economic institutions have counterparts in the political sphere. Political openness as well is important for the transformation towards a knowledge economy. One of the key factors in the knowledge economy is a trained and well skilled labor force. That brings us back to the *education* again, and to the fact that so many countries revolves around the improvement of their educational systems. So, according to Stiglitz, the knowledge economy requires creativity, additional *skills, training* in science and technology, strengthening of the *competition* in education sector. One more aspect that attention should be paid to is that in a global economy, the competition is being raised to a global level.

According to Kim and Mauborgne (1998), the key to succeeding in the knowledge economy except for engaging in voluntary cooperation is *knowledge sharing* among individuals in strategic decision making. What they refer to is that unlike the traditional factors of production, knowledge is a resource located in the human mind. Creating and sharing knowledge are intangible activities that can neither be supervised nor forced out of people (Kim et al., 1998). They happen only when individuals cooperate voluntarily. Without individuals' voluntary will to cooperate, these authors argue, organizations cannot effectively build their collective wisdom that is critical to succeed in this knowledge economy (Kim et al., 1998). According to this we can realize how much is important to have knowledge sharing among different national institutions, but also in the direction from institutions toward the citizens.

Furthermore, what is important is that every nation should look at its own GDP structure. The most developed nations have recognized movements in terms of the important economic

activities that comprise their GDPs. Nowadays these economies are less reliant upon primary commodities or secondary commodities such as manufactured goods. In the “new” economies, the emphasis, in terms of high economic value-added, is on service activities and intangible-based outputs (Guthrie, Petty, Johanson, 2001). These countries are now dominated by companies in the financial services, media and telecommunications, consulting and such sectors – companies that usually require only a small-scale investment in capital equipment. This paragraph points out clearly that economies of the transition countries such as Serbia need to be restructured and re-oriented in terms of putting more emphasis on service activities and intangible-based outputs in order to come closer to the concept of the Information Society.

In the literature on Knowledge Economy special emphasis is given to the spread of information technology. There are authors who inquire under what conditions developing or other countries can use this set of technologies to improve their learning capabilities. They argue that information technology should not be regarded as a potential substitute for human skills and tacit knowledge (Ernst, Lundvall, 1997). Less developed countries need “to develop their own hybrid forms of institutions that combine the advantages of theoretical models in a way that is appropriate to their idiosyncratic needs and capabilities” (Ernst et al., 1997). The same authors say that capability to learn determines the economic success, not only of firms and industries, but also of the whole regions and countries. This is how the concept “learning economy” emerged and it has been based on the cornerstone which points out that the “learning [...] its efficiency crucially depends on the institutional set-up, the national innovation system” (Ernst et al., 1997). What I wanted to put emphasis on in this part is that spread of ICTs is absolutely necessary for the transition economy such as Serbia in order to become a knowledge economy. The *capability to learn* is extremely important and actually is one of the determinants of the economic success of one country. Moreover, institutional innovation system – and the way in which ICTs and other innovative technologies in one country are being diffused – can define the ways of reaching the success of this very country on the global market.

As knowledge becomes accessible through the information networks, the establishment of national ICT capabilities should help to establish faster knowledge creation and diffusion. But the ICT revolution also poses new challenges in a way that “it increases the inequality of access to knowledge, while at the same time accelerating the pace of economic and technical change” (Ernst et al., 1997). This is especially emphasized in the less developed countries. What is important for developing countries is that a transfer of knowledge into information systems provides them with better access to new models developed in rich countries (Ernst et al., 1997). Policy requirements also change because of the complexity and a higher exposure to the international economy. As a developing country moves up from labor-intensive to more complex products, more sophisticated policies are required. Basically what this paragraph is about is that information networks are very important in the processes of knowledge creation and diffusion. In order to provide these networks and participate in them, a country needs to have more advanced



public policies addressing the more and more complex products and the technologies that produce them.

In order to benefit from this access to the information networks, developing countries need to strengthen their knowledge base. This condition has implications for the process of knowledge creation in a sense that its effectiveness depends on interactions among participants in this process (Ernst et al., 1997). Ernst et al. (1997) say that the knowledge generation within a society “is strongly influenced by the network of relations among its firms (...) with externalities, communication and interdependence playing crucial roles.” This refers to the national, as well as international networks which are very important in this thesis. And for not that developed countries, such international interdependence could be of “critical importance in order to overcome the vicious circle of underdevelopment” (Ernst et al., 1997). In general, the spread of ICT could help to break this vicious circle. Knowledge generation in this sense shifts from vertically integrated hierarchies to networks. For the majority of developing countries, the main challenge becomes how to create institutions that provide incentives for domestic learning.

To sum up, knowledge today is being recognized as the main force of economic growth. This leads us to a focus on the role of information, learning and technology in the economy. Basically what all the authors agree more-less is that knowledge-based economies are the economies which are based on the production, distribution and use of information and knowledge. Even more important is that all this has been done through networks that have become extremely relevant to the economic performance. It seems to me that public policies will need to put more emphasis on advancing the human capital through promoting access to a range of skills such as increasing the capacity to learn through the diffusion of technology and different kinds of networks. What is created is a network society on which I will put more stress in the next section. This network society is the society where “the opportunity and capability to get access to and join knowledge- and learning-intensive relations determines the socio-economic position of individuals and firms” (David and Foray, 1995). Moreover, I would add to this, not only of the individuals and firms, but also of the countries and regions. Public policies with the special emphasis on those relating to science, technology, education, and industry, will need to find a new value in the eyes of all the social factors. The most important priorities in this sense would be: enhancing the *knowledge diffusion*, and upgrading the *human capital*.

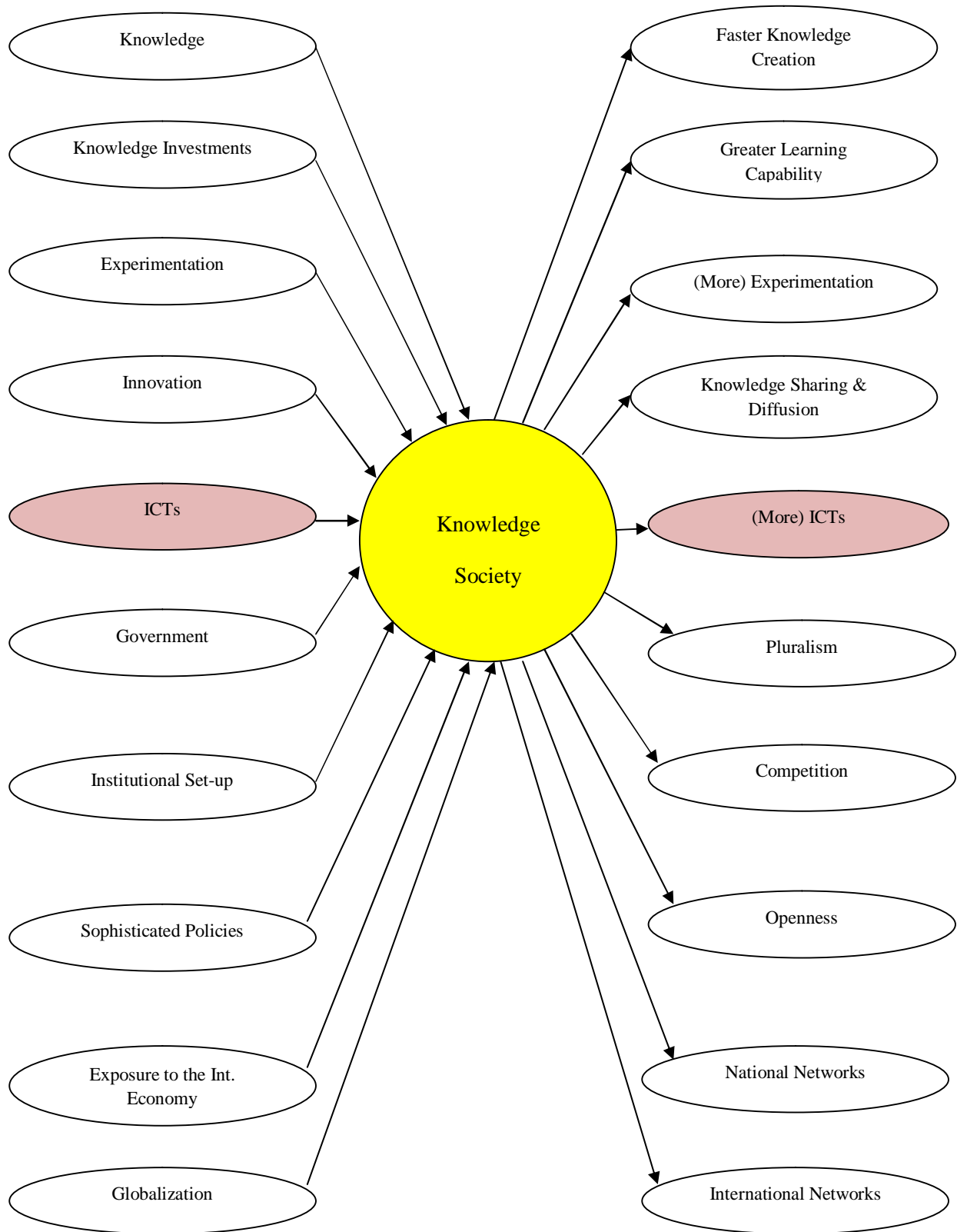


Figure 2. Summary of various authors' views on Knowledge Society

## Networked Society

After reviewing the concepts of Information and Knowledge Society, in this section the construct of Networked Society will be brought closer because in this term there is emphasis on the network as social structure for which we saw in the previous sections how important it is. As a global trend, national and international networks seem to be *a must* for both developed and less developed societies. Especially in transition countries, which means in Serbia as well, there is a need for knowledge and information that is being transferred much faster through networks nowadays than it was ever before. We will see why ICTs are so important in creating networks and why networks have such an important role in knowledge sharing and diffusion, which is, as I already mentioned in Figure 2, one of the most important products of Knowledge Society as well.

In this paragraph there will be mentioned definitions of the social structure, technological paradigm, network, Information Age, and technology. These definitions I will take and use them also later in the text as such. The first feature of the Network Society is that it is the social structure characteristic of the Information Age (Castells, 2000). The main feature of the social structure in the Information Age is, as it was stated in previous paragraph, its reliance on the networks. According to Castells (2000), networks are not brand new forms of social organization, but the stress is now on the fact that they are empowered by new information and communication technologies. Castells (2000) defines the *social structure* as “the organizational arrangements of humans in relationships of production/consumption, experience, and power, as expressed in meaningful interaction framed by culture.” By *Information Age* he refers to the fact that human societies perform their activities inside the technological paradigm constituted around and by ICTs. It is clear that this is the new paradigm that replaces the technological paradigm of the Industrial Society which was based on the production and distribution of energy. He says that what is new in modern age is “a new set of information technologies”. By *technology* Castells (2000) means “the use of scientific knowledge to specify ways of doing things in a reproducible manner”. Technology, according to Castells, is embodied in technical relationships, which are socially conditioned, so in itself it is not an independent, non-human dimension.

Basically what Castells says is that we are living in “a new economy”. This economy is, according to him, characterized by three features. It is informational, global, and networked. The economy is *informational* in a sense that the capacity of generating knowledge and processing/managing information determine the productivity and competitiveness of all kinds of economic units including countries. The economy is *global* in a sense that its “strategic activities have the capacity to work as a unit on a planetary scale in real time or chosen time.” (Castells,

2000) One of the strategic activities that Castells mentions is science and technology. Finally, this new economy is *networked* in a sense that at the heart of the connectivity of the global economy and of the flexibility of informational production, there is a new form of economic organization called – the network enterprise.

Now that we know that new economy is networked we can also take a look at how networks actually function. Castells says that networks “de-centre performance and share decision-making”. Moreover, network does not have a center, and it works on a binary logic – inclusion or exclusion. Castells argues that “all there is in the network is useful and necessary for the existence of the network.” Inferred from this, but also explicitly said by the same author, is the following:

*“What is not in the network does not exist from the network’s perspective, and thus must be either ignored (if it is not relevant to the network’s task), or eliminated (if it is competing in goals or in performance).”*

I think this is very important quote from Castells because it can tell us how important it is to be “the node” in the modern, global information network. Especially, transition countries such as Serbia need to understand that they have to be inside the network unless they want to be “ignored” or “eliminated”, as Castells put it. Once they are inside is not the guarantee that they will stay there forever, because it is said that “if a node in the network ceases to perform a useful function it is phased out from the network, and the network rearranges itself – as cells do in biological processes.” But equally important is that all nodes need each other as long as they are within the network. Castells says that nodes increase their importance by absorbing more information and processing it more efficiently. If it happens that they decline in their performance, other nodes might take over their tasks. This actually means, according to the same author, that the relevance of the nodes does not come from their “specific features”, but from their ability to be trusted by the network.

In this paragraph it will be referred to the Castells’s philosophy on Information networks as a new and distinctive historical form of social organization. The distinctive characteristics of structural transformations in modern society come from the implementation of information networks as the prevailing organizational form. It was defined by Castells that “social structures are sets of organizational regularities historically produced by social actors, and constantly challenged, and ultimately transformed by deliberate social action”. Since the Network Society is no exception to this sociological law, I will address the issue of certain patterns of change in the next paragraphs.

Castells’s conception of “the space of flows” is made up of three aspects – technology (the infrastructure of the network); places (the topology of the space formed by its nodes and hubs);

and people (the (relatively) secluded space of the managerial elite commanding the networks). In this thesis the main emphasis is put on technology as the infrastructure which provides the communication through information networks in one society. However, one more aspect will be taken into account and that is the aspect which I consider particularly important – the people.

THE SPACE OF FLOWS		
TECHNOLOGY	PLACES	PEOPLE

Figure 3. The Space of Flows (Castells)

To sum up, the concept Network Society was coined by Manuel Castells who has given a thorough analysis of what constitutes this kind of society. Some of the Castells’s key points based on which he formed the metaphor of network society are related to “information, communication, organizing people and power”. According to Castells, it seems that the global society is intertwined in networks and networks of networks. So, Castells views society as a network of people and organizations – or in network terms as “nodes and super-nodes”. The network itself is constituted by the communication of information between the “nodes”, which also implies that in the case of no-communication there is no network. Therefore, I want to apply these standards to Serbia and see whether this country is connected to a global Information Society by applying the standards that I have been introducing in this thesis.

Therefore and to sum up I can say that, according to what has been written about networks and Internet, Internet has revolutionized the means of communication. The concept of the network for society means that information flow is speeded up and the complexity of society is increased. Furthermore, the network concept makes the important issue of inclusion and exclusion apparent. Securing the local or national, also the international inclusion in the network is a prerequisite for achieving the principle of equality, but also the economic growth as I showed this before. If national and international inclusion was not the case, the concept of the network would certainly have a tendency to become only a catchword. If the digital literacy is not one of the highest priorities to a certain government, especially in a transition country – and is not implemented respectively as wide as possible – we can consider then that this government is not aware of all the benefits, on the one hand, and all the risks, on the other, when it comes to the *digital inclusion*. Respectively this means that *digital divide* is not taken seriously as a threat and that it is a great imminent danger to the Government and the whole country.

In summarizing the previous section I can say that Networked Society is the concept described mostly by Castells and other authors as a new way of organizing the social and political matters

in a nation state, as well as on the global level. ICTs and Internet are some of the most important factors shaping the future of the Networked Society. Basically, there is no real reason why someone would want to make an unbridgeable distinction between Information and Networked Society. In other words, just as our assumption was on the beginning of this chapter, Information, Knowledge and Networked Society is *the* modern global society. In the countries where features of this/these society/societies exist less, tendency is that those countries have as a *must* on their agenda to implement or at least start introducing the main features of this Society to the people that live there. This means that if Serbia does not have the establishing of the Information Society set high on the agenda of public challenges; it will have to start dealing more seriously with it. Networking the citizens, public sectors and regions, and indicating social and economic benefits to the people in using the ICTs and Internet should be in the focus of the most important IS-related documents, let alone in the implementation processes.

## **2.2. Information Society and Transition Countries**

In this chapter I will explain how Information Society concept once implemented can help transition countries in easier reaching the goals like economy growth and high productivity. Marcin Piatkowski made a research on how ICTs affect economy development of transition countries that joined EU in 2004, which means that this author referred to the fact how ICTs can help the transition economies in general. I will refer to this since Serbia is transition country and is on its way to joining EU. Piatkowski showed that in the period between 1995 and 2003, implementing ICTs made an extraordinary effect when it comes to four countries, some of new member-states in that year (Czech Republic, Hungary, Poland and Slovenia), and that is exactly the thing that, among others, powerfully brought closer these countries to EU. ICTs were mainly responsible for productivity growth in these four countries, but in the other six it was noticeable as well.

Piatkowski's researches showed that ICTs have a potential for productivity and GDP growth, but in combination with other factors it can produce significant effects in order to make transition economies booming. This author also made a projection based on Polish example on how ICTs' stake in productivity and GDP growth in years to come are going to be great, and that it is going to be more than 25%. But this author made a very indicative observation in terms of the framework of this thesis and that is the fact that one of the main obstacles in obtaining even greater benefits from ICTs is low level of Internet diffusion in these countries comparing them to the old 15 EU member-states.

In his article called "Does ICT Investment Matter for Growth and Labor Productivity in Transition Economies?", Piatkowski followed up on his previous paper on the contribution of

ICT capital to growth and labor productivity in Poland 1995-2000. So, this paper extends the study to the following transition economies: Bulgaria, Czech Republic, Hungary, Poland, Russia, Slovakia and Slovenia. The article shows that the contribution of *investment in IT hardware, software and telecommunication equipment* to output growth and labor productivity between 1995 and 2000 in most countries featured in the study was much higher than what might be expected on the basis of the level of their GDP per capita (Piatkowski, 2003). Furthermore, this might suggest that the transition economies – through the use of ICT – can benefit from the technological progressing to increase the growth rates in output and labor productivity and hence accelerate the process of catching-up with more developed economies (Piatkowski, 2003).

The relatively large contribution of ICT capital to output growth and labor productivity, as Piatkowski argues, is due to an extraordinary acceleration in real ICT investments, which were growing in between 1995 and 2000 at an average rate of more than 20% a year for almost all countries in the study. Large investments in ICTs seem to have been induced by “falling prices of ICT products and services, which encouraged companies to substitute ICT for non-ICT capital”, and on the other hand, “an opportunity for higher-than-normal returns on ICT investments due to a large pent-up demand for ICT infrastructure, a legacy of decapitalization and technological gap existing before 1989” (Piatkowski, 2003).

*Real investments in ICTs* in most transition countries in between 1995 and 2000 have been growing at very high average annual rates of *more than 20%* (Piatkowski, 2003). Poland, Czech Republic, Romania, and Slovenia reported the highest real growth rates of 39%, 31%, 30% and 30%, while Russia’s ICT investment grew by 17% annually in the period (Piatkowski, 2003). The growth rates in real ICT investment for the transition countries were much higher than in the EU and the US, which in the same period amounted to 18.5% and 19.3%, respectively (van Ark et al. 2002, cited by Piatkowski, 2003). Finally, the author arrived at a measure of the end-year real ICT capital stock 1985-2001. Between 1995 and 2000, because of large ICT investments, the real stock of ICT was quickly growing (Piatkowski, 2003). As a consequence of the rapid growth in real ICT stock, its average share in the net total capital stock between 1995 and 2000 increased in most countries (Piatkowski, 2003). Czech Republic, Hungary, and Slovenia reported the highest average ICT stock shares in total net capital of 3.78%, 3.73% and 2.86% respectively (Piatkowski, 2003).

In relative terms, ICT investment had a largest impact on *labor productivity growth* in Bulgaria (34.4%), Czech Republic (27.9%), and Hungary (22.4%), which was a higher average than in the EU (17%) and the US (20%) (van Ark et al. 2002, cited by Piatkowski, 2003). Slovakia, Poland, and Slovenia reported the highest average growth rates of labor productivity between 1995 and 2000. The increase in labor productivity in these countries was largely driven by the growth in *Total Factor Productivity (TFP)*. According to Piatkowski, it turned out to be that the TFP

growth is much less strongly correlated with the extent of the progress in market reforms than the ICT contribution to output growth.

To sum up findings in this section so far, the relatively large contribution of ICT capital to output growth and labor productivity is based on an extraordinary *increase in real ICT investments*, which were growing between 1995 and 2000 at an average rate of more than 20% a year for almost all countries in the study. Large investments in ICT seem to have been induced by falling prices of ICT products and services, which encouraged companies to substitute ICT for non-ICT capital, and an opportunity for higher-than-normal returns on ICT investments due a large pent-up demand for ICT infrastructure, which was a legacy of decapitalization and technological gap existing before 1989 under the socialist economic system (Piatkowski, 2003).

Another article by Ark and Piatkowski (2004) investigates the productivity performance of CEE countries vis-a-vis the EU-15 during the 1990s to detect sources of convergence between the two regions. The paper shows that changes in labor intensity have been an important source of productivity convergence during the 1990s, and are likely to remain so in the near future. It is also found that despite lower income levels, ICT capital in the CEE-10 has contributed as much to labor productivity growth as in the EU-15. According to Ark et al., industry analysis has shown that *manufacturing industries* that have invested to a great extent in ICT have been a key to the restructuring process. As such, Ark and Piatkowski argue, ICT may therefore have been an important source of growth but probably temporary source of convergence. For the longer period, the impact of ICT on growth will have to come primarily from its *productive use in services* (Ark, Piatkowski, 2004).

While these authors argue that it is not possible to disentangle the productivity contribution from all factors, on the other hand they say it can be argued that part of the rapid increase in TFP was driven by large scale privatization and liquidation of inefficient state-owned companies, a phenomenon mostly unique to countries transitioning from a centrally planned to a market economy. These are likely to be strongly related to the effects of the emergence of new, more productive firms, liquidation of state-owned companies, technology transfer, higher capacity utilization, improvement in managerial and business skills, an increase in human capital and more entrenched macroeconomic stability. Some other part of the growth in labor productivity originated from an effect of higher capacity utilization as (after 1995) most CEE countries quickly recovered from the transitional recession, which turned from 18% to 40% of their GDP as of 1989 (Kolodko 2000; cited by Ark et al., 2004). However, privatization and the rise in capacity utilization, as Ark et al. put it, which contributed to high labor productivity growth rates in the CEE countries, were mostly of “a one-off nature”. Their findings show that if these two factors could be disentangled from aggregate productivity growth, the relative contribution of ICT capital would most likely still be higher than in the EU-15 countries due to its own



contribution to restructuring. Therefore, these authors strongly argue that ICT can be seen as an important source of convergence between CEE-countries and the EU-15 during the 1990s.

It has also been shown by the same two authors that productivity growth rates in ICT-manufacturing are in most cases two times or more larger than the productivity growth rates in non-ICT manufacturing. In particular ICT using-industries like transport equipment and electrical machinery exhibit “rapid productivity growth” (Ark, Piatkowski, 2004). This is a clear indication that ICT has been an important source of productivity growth in manufacturing in CEE countries (Ark et al., 2004). According to one of the tables in their article, ICT-using manufacturing industries in the CEE countries contribute for between 0.46 and 0.98 percentage point to aggregate labor productivity growth between 1993 and 2001, against close to zero for the EU-15 and the U.S. (Ark et al., 2004).

The previous section presented contributions of ICT to the catching-up process on the aggregate and industry-level in the CEE and EU countries. Provided the findings in this section so far, it is to be concluded that the evidence points in the direction of a role for ICT as a source of growth in CEE transition countries, and in the manufacturing sector as a source of convergence (Ark et al., 2004). The more permanent contribution of ICT to growth will depend on the existence of a conducive environment for ICT investment in services and productivity enhancing practices. This experience of transition countries that joined EU can be applied, with some limitations, to the other transition countries that are on their way to joining EU at this moment such as Serbia.

### 3. Information Society and Innovation Diffusion

In this chapter I will present Innovation, Technology and Internet diffusion theories respectively. Given the fact that Internet and ICTs are innovations in Serbia I will start by pointing out what the definitions of innovation, diffusion, and ICTs are. The research question which I introduce and give an answer to in this chapter is: what are the main things governments of transition countries need to do to promote ICTs and Internet diffusion? Additionally, after referring to all the mentioned theories, I will also go deeper into Piatkowski's empirical generalizations about transition countries that joined EU in 2004. Basically Piatkowski shows what transition countries can and should do to promote ICTs and Internet diffusion. This can help us understand the decisive moment in which Serbia and its citizens, especially political and social elites are. Both citizens and elites need to comprehend how to promote better quality of ICT infrastructure and higher level of Internet diffusion if they want Serbia to be networked and with clear IS standards that can stimulate improving the quality of life of all its citizens.

In general, innovation diffusion theories can provide a useful perspective on one of the most persistently challenging topics in the ICT field. For this reason, diffusion is growing in popularity as a reference theory for empirical studies of information technology adoption and diffusion (Fichman, 1992). Innovation diffusion theory provides developed concepts and empirical results applicable to the study of technology adoption and implementation. Diffusion theory provides tools, both quantitative and qualitative, for assessing the rate of technology diffusion, and moreover, identifies numerous factors that facilitate or impede technology adoption and implementation. These factors include: 1) characteristics of the technology, 2) characteristics of adopters, and 3) the means by which adopters learn about and are persuaded to adopt the technology (Rogers 1983). Given the fact what I just mentioned then it is not so surprising that innovation diffusion theories become popular reference theory for empirical studies of information technologies.

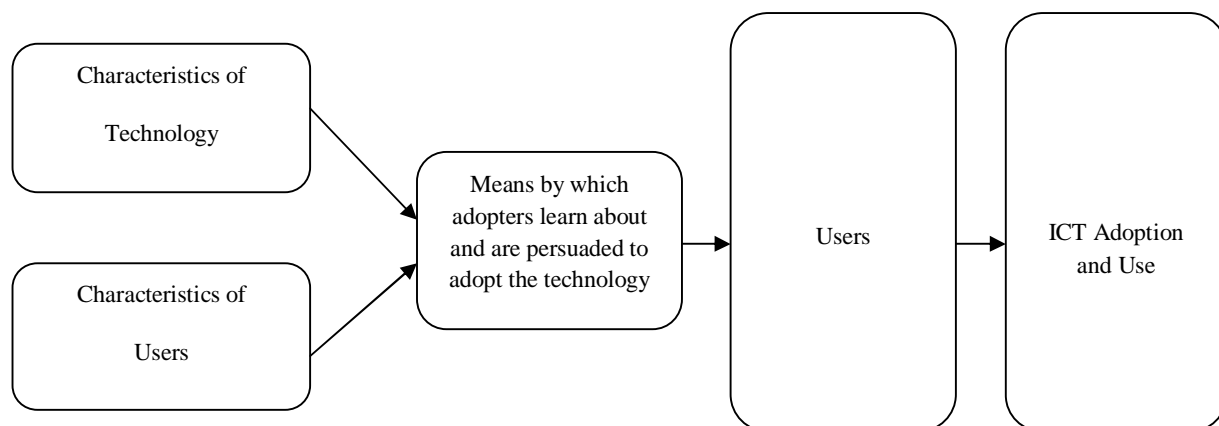


Figure 4. Technology Adoption Model by Rogers (1983)

Basically, in this chapter after I present how innovation is being defined by different authors, as well as how these authors define innovation diffusion processes I will provide the analysis of innovation diffusion theories chosen according to the case that I analyze further in the text. Certain definitions of relevant concepts will be chosen and operationalized for the case of Serbia in order to use them as a tool in describing and explaining factors which affect the Internet diffusion processes.

Furthermore, before going to the section about Internet diffusion, I will present Technology diffusion theories with an emphasis on the Technology Acceptance Model which I consider to be important for the Serbian case. In the section about Internet diffusion, I will introduce Internet diffusion theories and models, with special emphasis on Internet Engagement Model by Norris (2001), and Three Groups of Factors Model by Hundley, Anderson, Bikson, Dewar, Green, Libicki and Neu (2000). These models have certain variables in common which allow us combining them into one integrative model developed by numerous authors, thus having a broader academic support and legitimacy for the theory I use to conduct the empirical part of the thesis.

### **3.1. General Innovation Diffusion Theory**

In this section I will present the basic ideas and definitions of the main concepts I use later in the empirical part, such as: innovation, adoption, diffusion, innovation diffusion, ICTs, etc. Innovation is defined as “an idea, practice, or material artifact perceived to be new by the relevant unit of adoption” (Zaltman et al. 1973; Rogers 1982; quoted from Nilakanta, Scamell, 1990); or “any idea, practice or object that is perceived as new by the adopter” (Fichman, 1992). Diffusion is the process through which “an innovation, defined as an idea perceived as new, spreads via certain communication channels over time among the members of a social system” (Rogers, 2004). The process of diffusion is also defined as “the acceptance, over time, of some specific item—an idea or practice, by individuals, groups or other adopting units, linked to specific channels of communication, to a social structure, and to a given system of values, or culture” (Katz, Levin, Hamilton, 1963). In this definition I put emphasis on the concepts of “acceptance”, “specific item”, “specific channels of communication” and “social structure”. The diffusion of innovation is considered to be one of the major mechanisms of social and technical change (Katz, Levin, Hamilton, 1963), and firstly we need to understand it as “a function of communication” (Hagerstrand, 1965). A time-lag between information and adoption<sup>2</sup>, as Hagerstrand also argues, is a normal feature; and what is going on during that time is equally important though it may be less easy to understand because it is usually an unperceivable mental

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<sup>2</sup> “Adoption of an innovation is a micro process that focuses on the stages through which an individual passes when deciding to accept or reject the innovation.” (Dholakia N., Dholakia R., Kshetri, 2003)

process. That means that also in the case of Internet diffusion in Serbia, it would be difficult to understand which mental processes in population develop, but it would be very useful for us to understand how population communicate their reasons for Internet-usage or non-usage. One more thing, since ICTs are mentioned many times so far in this thesis and will be mentioned in the further text as well, I mean by ICTs, “technologies that facilitate the capturing, processing, storage, transfer, and presentation of information.” (Dholakia N., Dholakia R., Kshetri, 2003)

Now I will analyze Rogers’s theory about innovation diffusion. Rogers (1983) provides a synthesis of over 3000 studies on the adoption and diffusion. The results of these studies include generalizations about innovation diffusion, and the ways by which innovations spread through populations of potential adopters. Some of the generalizations that will be useful further in the research are:

- 1) Innovations possess certain characteristics which, as perceived by adopters, determine the ultimate rate and pattern of adoption (those characteristics are – advantage, compatibility, complexity, trialability and observability)
- 2) Some potential adopters are more innovative than others, and can be identified as such by their personal characteristics (some of characteristics are - "cosmopolitanism", level of education, etc.);
- 3) The adoption decision unfolds as a series of stages (going from knowledge of the innovation through persuasion, decision, implementation and confirmation) and adopters are predisposed towards different kinds of influence (mass market communication, word-of-mouth, etc.) at different stages;
- 4) The actions of certain kinds of individuals (opinion leaders and change agents) can accelerate adoption, especially when potential adopters view such individuals as being similar to themselves; and
- 5) The diffusion process usually starts out slowly among pioneering adopters, reaches "take-off" as a growing community of adopters is established and the effects of peer influence kick-in, and levels-off as the population of potential adopters becomes exhausted, thus leading to an "S-shaped" cumulative adoption curve (Fichman, 1992).

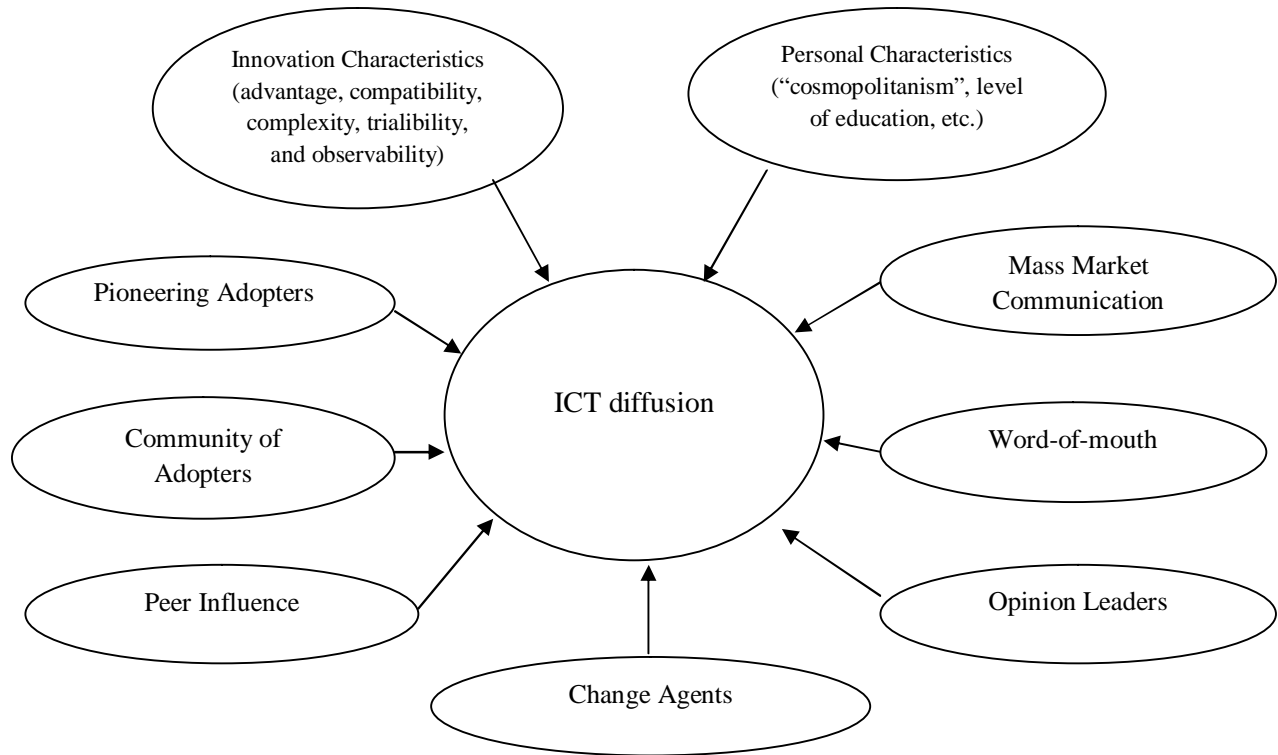


Figure 5. ICT diffusion with different kinds of influences; synthesis of 3000 studies on technology diffusion and adoption (Rogers, 1983)

What is important to mention is that one of the major limitations of classical diffusion theory is “the implicit assumption that individuals are adopting innovations for their own independent use, rather than being part of a larger community of interdependent users” (Fichman, 1992). There are at least two different ways that a technology can involve important user interdependencies. First, the technology can be subject to *network externalities* (Katz and Shapiro 1986; Markus 1987; here cited by Fichman, 1992), which means that the value of use to any single adopter is a function of the size of the network of other users. This concept was originally developed in the context of telephone networks, where the value of subscribership to any individual is directly related to the number of other subscribers that individual can communicate with. Examples of recent ICT innovations strongly subject to network externalities include E-mail, voice messaging and computer conferencing (Fichman, 1992). Second, the use of the technology can be intertwined with *organizational routines* (Nelson and Winter 1982), which means any individual's interaction within the system must fit within some larger organizational process (Fichman, 1992). Also important to add here is that some technologies impose a substantial *knowledge burden* on potential adopters. While classical diffusion focuses on the determinants of a potential adopter’s willingness to adopt, in situations where knowledge barriers are high the more revealing explanation can be an adopter's *ability to adopt* (Fichman, 1992). At the macro

diffusion level, Attewell (1992) has argued that the diffusion of complex organizational technologies is better understood as a process driven by *decreasing knowledge barriers* than as a process driven by communication and social influence (as per classical diffusion theory). The main implication here is that the rate and pattern of diffusion may depend less on how supply-side institutions signal the innovation (for example, through media), than on the development of *institutions for lowering knowledge barriers* (Fichman, 1992).

To sum up, what this section points out is that, given the definitions of innovation, adoption, diffusion and innovation diffusion, and especially the generalizations made about innovation, personal and circumstantial characteristics (Rogers, 1983), I can say that knowledge barriers, adopter's ability to adopt, and individuals and institutions powerful enough to decrease the knowledge barriers are of the essential importance to enhance the innovation diffusion processes. Practically this means that all the countries, not only the transition ones, should take into consideration the fact that the populations of potential adopters need to have the required knowledge if want to use ICTs, in this case – Internet. Therefore, government policies addressing the Internet diffusion, as well as promoting the better ICT infrastructure, need to take into account that government actions should take a strong lead in enhancing the over-all knowledge about ICTs in the society, as well as in the training of all social groups affected by ICTs.

### **3.2. General Technology Diffusion Theory**

Our understanding of the processes of innovation and technology diffusion and assimilation has grown considerably since ICT researchers first became interested in this area in the early 1980's. As researchers have considered the many distinctive characteristics of ICT innovations, there has been a corresponding effort to develop more sophisticated models that go beyond traditional approaches to incorporate the effects of institutions, knowledge barriers, increasing returns, adaptive structuration, social bandwagons and others. All these models can be a rich opportunity going forward to confirm these theoretical streams and synthesize them into more complex and realist models of ICT innovation diffusion and assimilation. I have chosen this path of synthesis of models in order to reach a bit wider model that can be appropriate to analyze innovation, technology and Internet diffusion in Serbia respectively.

In this section I will introduce Technology Diffusion theories and refer to some of the important and used concepts when it comes to the spread of technologies in a society. This is important to understand because Internet diffusion is closely related to the Technology diffusion processes, which basically have similar patterns and models.

## Innovation Characteristics and Propagating Institutions

In his article, Fichman (1999) argues about technologies and diffusion environments, and comes to the conclusions about innovation characteristics and propagating institutions. About innovation characteristics he said that a central notion in the study of innovation is that technologies possess certain *attributes or characteristics*, and that these characteristics have systematic effects on diffusion and assimilation. At the end of his discussion, Fichman refers to Rogers (1995) who highlights five such characteristics, including relative advantage, compatibility, complexity, trialability and observability (Fichman, 1999).

Although some technologies initially emerge as more complex, expensive and incompatible than others, these initial characteristics can be moderated by the actions of *institutions* seeking to propagate those innovations (Eveland and Tornatzky, 1990; King, et al., 1994; Reddy, et al., 1991; Robertson and Gatignon, 1986; Swanson and Ramiller, 1997; cited by Fichman, 1999). These institutions include research and development laboratories, government agencies, technology vendors, consulting firms, and user groups help to determine the level of resources applied to the task of communicating, promoting and enhancing a technology, and therefore can have a great deal of impact on the rate of technology diffusion (Fichman, 1999).

While some authors would doubt that innovation perceptions have a major influence on adoption, anyway this triggers the question of how these *perceptions* are formed. There are two main schools of thought here, and Fichman refers to them in his article: the rational/contingent school and the social learning school (Kraut, et al., 1998; Webster and Trevino, 1995, cited by Fichman, 1999). Adherents of the first school argue that potential adopters form perceptions primarily based on an assessment of the *objective* features of the technology, as conditioned by their *own particular needs* and capabilities (or, in the case formal adoption decisions, by the organization's needs and capabilities). According to Fichman, adherents of the second school argue that technology perceptions are primarily *socially constructed* (Fulk, 1993), which means they are driven by an individual's observation of group norms and co-worker attitudes and behaviors toward the innovation (Webster and Trevino, 1995). Fichman also wrote that while earlier work cast the two perspectives as competing (Fulk, 1993), more recent work has argued for integrating the two perspectives (Karahanna and Straub, 1999; Kraut, et al., 1998; Webster and Trevino, 1995; cited by Fichman, 1999). This integrative perspective is consistent with Rogers's model, which holds that innovation perceptions are affected not only by objective features of the technology, but also by the actions of opinion leaders and change agents (Leonard-Barton, 1985; Rogers, 1995, pg. 330).

Therefore, as for the perceptions of the technology, they are affected by many factors beyond features of the technology itself and its interaction with characteristics of the adopting unit.

Those other factors include the characteristics of the perceiver, and whether the prevailing social norms related to the technology are perceived positive or negative. Nevertheless, all these factors can be moderated, as it was said by numerous, abovementioned authors, by the actions of innovation-propagating institutions. This means that whichever country wants to spread the technology as wide as possible on its territory, it should actively promote through its institutions the technology that is considered needed.

### Incomplete Products and Infrastructure Dependence

Many ICT innovations, especially more revolutionary breakthroughs, initially emerge as incomplete products in a sense that they only provide partial solutions to the problems, or that they are only suitable for very specialized applications (Levitt, 1986; Moore, 1992; Rosenberg, 1994, cited by Fichman, 1999). It is usually said that innovation simply cannot be adopted prior to the diffusion of some necessary supporting infrastructure, for example, ISDN telephony applications require that ISDN be supported by telecommunication service providers (Fichman, 1999).

I will refer now to the diffusion model that has existed for a long time, almost 60 years. As Rogers (2004) argues, the basic diffusion model has evolved and important additions such as the following have been made. We should take them into consideration as concepts when analyzing the innovation or Internet diffusion in transition countries such as Serbia:

- 1) The critical mass, defined as the point at which enough individuals have adopted an innovation that further diffusion becomes self-sustaining,
- 2) A focus on networks as a means of gaining further understanding of how a new idea spreads through interpersonal channels,
- 3) Re-invention, the process through which an innovation is changed by its adopters during the diffusion process (Rogers, 2004).

This author's (Rogers, 2004) main conclusion is that the diffusion process displays consistent patterns and regularities, across a range of conditions, innovations, and cultures. Thus, according to him, it seems there is a general diffusion model. At the end of this section I emphasize what few authors mentioned about the fact that innovation diffusion needs to be closely followed by policy innovation and policy innovation diffusion implemented by relevant institutions and organizations which can bring and construct the stimulating and challenging environment for expanding the Information Society conditions.



To sum up, what we can infer from this section is that every innovation, therefore technology too, has its own attributes or characteristics. These characteristics, together with the perceptions they form, are very important part of the technology diffusion process. However, even though these features are something we should pay attention to, we should not forget about numerous institutions that can moderate these characteristics and, in a certain way, re-invent the innovations all over again. We learned from Rogers (2004) that once the critical mass of adopters is formed and focus on networks is stable there ought to be more stress on the re-invention of the technological innovation which in a new fashion can be adopted in an easier and better way. This is obvious since it has already been stated in this section that there is, except for the objective features of the technology (conditioned by individual's particular needs), also socially structured features which are driven mostly by the group norms.

### 3.2.1. Technology Acceptance Model

After referring to some of the authors and theories in constructing the framework through which we can assess Serbia's progress when it comes to the innovation and technology diffusion, in this section we will take a brief look at one particular model called Technology Acceptance Model.

Technology Acceptance Model (TAM) specifies a pathway of technology acceptance, from external variables to beliefs, attitudes, and system usage (Burton-Jones, Hubona, 2006). According to Burton-Jones and Hubona (2006), of the set of theories that explain technology acceptance, TAM appears the most popular because it explains ICT-use in a clear way, as a function of a four-stage process, which is also shown in the figure below:

- 1) external variables (user training) influences user beliefs about using the system;
- 2) user beliefs influence their attitudes about using a system;
- 3) user attitudes influence their intentions to use a system;
- 4) user intentions determine level of usage of the system (Burton-Jones, Hubona, 2006).

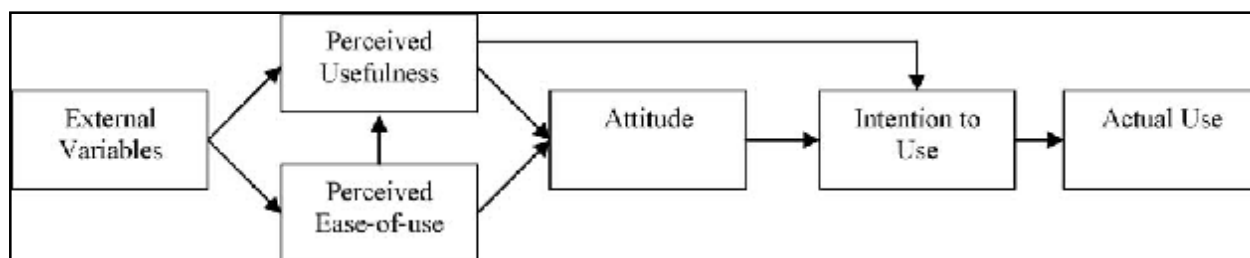


Figure 6. Original Technology Acceptance Model

Burton-Jones and Hubona argue that TAM uses two belief constructs: perceived usefulness (PU) and perceived ease-of-use (PEOU). They think that TAM accepts that external variables predict usage only through their effect on PU and PEOU. What is interesting is that according to social psychology theories, an individual's behavior is not just driven by evaluative beliefs and attitudes, but also by subjective norms, perceived behavioral control, and habits. Certain results suggest that TAM's full-mediation assumption is overstated (Burton-Jones, Hubona, 2006). Burton-Jones and Hubona have found that external variables can have a strong direct effect on usage over and above their effect on attitudes and beliefs.

It is obvious that this Burton-Jones and Hubona's discovery is very important since in increasing the Internet diffusion level in Serbia, policy-makers need to deal with which intentions citizens have when it comes to the Internet use, and also they would need to deal with how to make Internet being used even without affecting, according to the two aforementioned authors – two overemphasized variables – such as PU and PEOU. We will see in empirical part why this is important in creating and implementing the strategy of Internet diffusion in Serbia or any other transition country, and namely developing the Information Society and electronic services in a reform process afterwards.

### **3.3. General Internet Diffusion Theory**

Since Internet on a global level can still be understood as an innovation, I will start once more with referring to the innovation on a more general level in order to narrow down the theory and finally introduce the models that can help us understand the Internet diffusion in Serbia and see what the main things are that governments need to do to promote this diffusion.

It is well-known that needs create innovations, as well as that innovations create needs. Information-communication system, based on ICT development, is a part of bigger picture in a sense of global societal system. Acquiring innovations always require certain changes in social and cultural patterns of a certain subject, and diffusion of innovation is mostly tied to social conditions that stimulate or inhibit them. Researches made so far about the diffusion of innovation process often do not pay that much attention to the ending of the diffusion process and that is the fact of accepting and integrating the innovation into daily lives of the people. What is important is that innovation is not always the best response to a given need, and that next to the desired consequences; it can have undesired ones as well. That means that innovation can be functional or dysfunctional, most of the time it has both characteristics.

Also, innovations are not always rationally adjusted, and not all of their consequences can be predicted in a rational manner. Some of them are manifest, while others are not that obvious; therefore it is hard to analyze which phenomenon is really a product of certain innovations. Most

of the time real consequences of innovations could be found only after relatively long period of time, and one is hardly in position to judge whether enough time has passed in order to assess real and concrete consequences of such innovation as ICT and IS (Milovanovic, Sitarski, Petrovic, Golcevski, Barisic and Milovanovic, 2005). One of the most important elements in innovation diffusion is interests of groups that want to enforce or inhibit the innovation no matter which stage of innovation diffusion is analyzed. Opposite interests always exist, and especially it is the case with controversial issues such as innovation being implemented in a new context. What is of utmost relevance is that for any innovation there has to be particular side or group that is specifically interested in accepting and diffusing innovation further into the society. In the case of Serbia (or any other transition country) we will see how much it is important that State structure, and Government at its helm, should be involved in promoting Internet diffusion.

In his innovation diffusion theory, Rogers mentioned that pending on the characteristics of a given innovation, speed of accepting it will be mostly related to how members of a given society think and feel about it. Success of any innovation heavily depends, according to Rogers, on how well it fits daily lives of people, members of that society (Rogers, 1962). According to Rogers, all the researches about innovation diffusion imply that accepting rate of a given innovation accelerates at a moment when innovation is being accepted by 10-25% of a targeted group.

After referring to the relation between Internet diffusion processes and social, cultural and economic factors which are very important, I will refer to a few models that are analytically very useful when it comes to understanding perplexity of the factors involved in Internet diffusion. The diffusion pattern of an innovation such as the Internet is a function of economic, political, cultural and geographical factors (Dholakia N., Dholakia R., Kshetri, 2003). Since countries and social systems around the globe differ significantly in terms of these factors, Internet diffusion patterns might also vary widely. It is important to know that Internet is the fastest diffusing ICT innovation up to now (Dholakia et al., 2003). Basically it took only three years for the Internet to reach 50 million users, and on the other hand, it took 38 years for radio and 13 years for television to have 50 million users (Bell and Tang, 1998; cited by Dholakia et al., 2003). Throughout 1999, the number of Internet users increased by 1 million every month (McLaren, 1999; cited by Dholakia et al., 2003).

There is enough evidence to say that *economic factors* such as income level, availability and price structures of ICT products and services, and bandwidth and supporting infrastructures influence the diffusion of the Internet (Kshetri, 2001; cited by Dholakia et al., 2003). The example is that the cost of a PC as a proportion of GDP is 5 per cent in high-income countries compared to about 300 per cent in low-income countries (Dholakia et al., 2003). In January 2001, the price of the cheapest Pentium III computer was US\$ 700 (UNDP 2001b, cited by Dholakia et al., 2003), an amount much higher than the average per capita GDP of most developing countries. Similarly, monthly Internet access charge as a proportion of per capita

GDP in 2001 varied from 1.2 percent in the U.S. to 118 per cent in Sierra Leone (Dholakia et al., 2003). This means that economic factors influence the means used to access the Internet. On the other hand, many people in developing countries who cannot afford computer, can access the Internet through, for example, public kiosks and cafes at much lower prices. Finally, according to Dholakia et al. (2003) bandwidth availability is a determinant of Internet diffusion, and these authors argue that this availability is very low in developing countries. This is very important because the lower bandwidth results need more time to transfer data, and this fact can decrease the relative advantage of Internet use. Furthermore, the lack of infrastructures on the regional or national level can also be an obstacle and affect the further increasing of costs of acquiring the Internet access. For example, if “high bandwidth is available and reasonably priced, as in South Korea, it becomes a driver of rapid Internet diffusion” (Dholakia et al., 2003).

Going further to the *socio-cultural factors*, I can say that there are at least few authors (Rogers, Dholakia et al., etc.) who agree that the degree of compatibility of the Internet with the values and norms of a social system influences its diffusion patterns in that social system. That means that an investigation about the values and culture can help us predict the degree of Internet penetration or non-penetration in a society. Very important component of the value system is skills that are required to use the Internet adequately. This means that digital literacy and skills are some of the most important conditions to use the Internet. The large proportions of the populations in the transition countries, and I will prove this later, is digitally illiterate and lack computer skills. One more important thing is that Internet tends to put in the privileged position the English-speaking population because most of the software and interfaces used in the Internet are in English. (Dholakia et al., 2003) It goes the same for the large proportion of the “WWW content” that is in English. According to the researches made in 1998, about 85 per cent of the texts on the WWW were in English (Nunberg 2000; cited by Dholakia et al., 2003).

As for the *geopolitical factors*, it is important to say that national institutions can take measures to influence an innovation, as well as innovation diffusion process. According to Dholakia et al. (2003), political support strongly influences Internet diffusion patterns. The digital divide cannot be bridged even if there are large investments in ICTs – sufficient political support is needed too. According to Kshetri (2001), Internet diffusion in several countries, especially the developing ones, has been hindered by political factors such as *tariff/non-tariff barriers* to ICT products, and *unfavorable regulatory environments* that negatively influence the telecom markets (cited by Dholakia et al., 2003). Many developing countries treat ICT products as luxury items and impose import duty, value added tax, sales tax, etc., and in this way making ICT products expensive and practically unobtainable (Dholakia et al., 2003). This is important because some of the transition countries do the same.

Much richer understanding of the complex processes of the Internet diffusion requires an integration of theories from diverse perspectives such as political science and international

relations, sociology, marketing, communications, information systems, and geography. In that sense this thesis has limitations since the scope of its investigation, as well as the given time to finish the research, are not sufficient to provide analyses based on the theoretical framework that would be that deep to integrate all the above mentioned sciences. Furthermore, that is also not that aim of this research.

After referring to the economic, socio-cultural, and geopolitical factors, I will go further to the analytical models that can help us comprehend the mutual relations among different Internet diffusion factors that I have mentioned so far. The figure below shows the Internet Engagement Model which was developed by Norris in 2001. This model helps us understand the complexity of relations between institutional and social spheres in Internet diffusion processes.

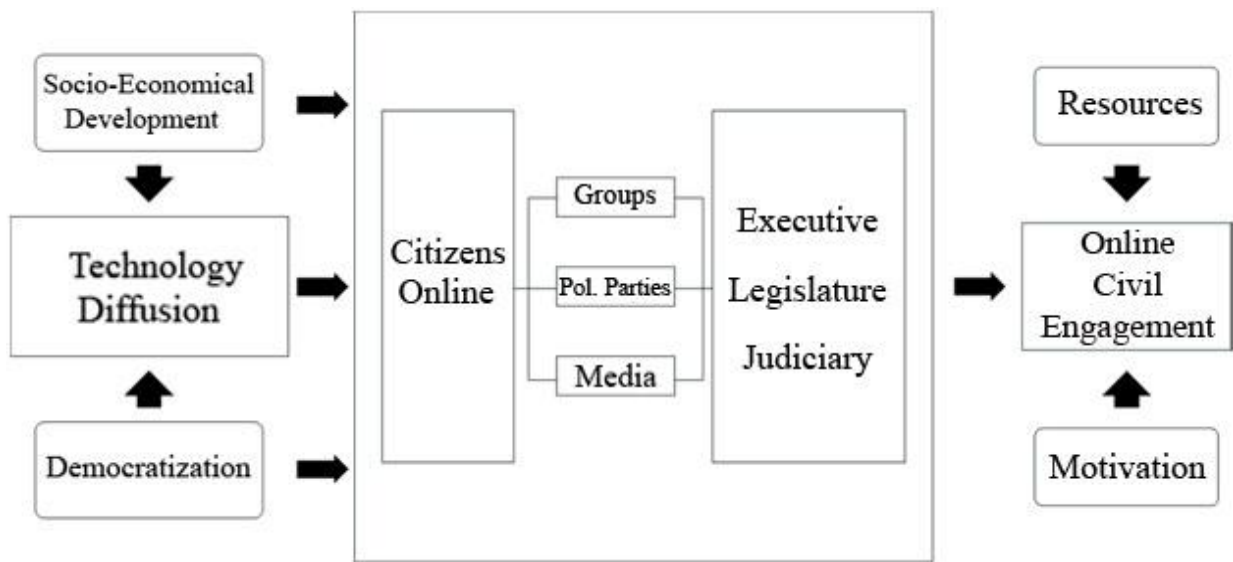


Figure 7. Internet Engagement Model (Norris, 2001).

Norris's model has to do with an individual employed in a process of social and political interaction on the Internet, but it is still big enough to contain a framework in which global participation level can be analyzed. In the model there is a national context on the left side which contains social, economical and political *conditions* when it comes to the Internet diffusion. In the middle, one can see institutional context that contains mediators in the interactions between citizens and State in a *political system*. What is important to mention here is that, also according to Dholakia et al. (2003), theoretical and empirical evidence points out that politics and government policy play important roles in the diffusion of ICTs. Finally, on an *individual* level (on the right side), resources and motivation are the factors when it comes to the decision about engaging on the Internet (cited by Milovanovic et al., 2005).

This model reminds us also of the “S-curve” model which explains various factors’ effects when it comes to the Internet diffusion, and they are shown in the next figure. This is the explanation being mentioned in the conclusions of the conference called “The Global Course of the Information Revolution: Political, Economic, and Social Consequences” (Hundley, Anderson, Bikson, Dewar, Green, Libicki & Neu, 2000).

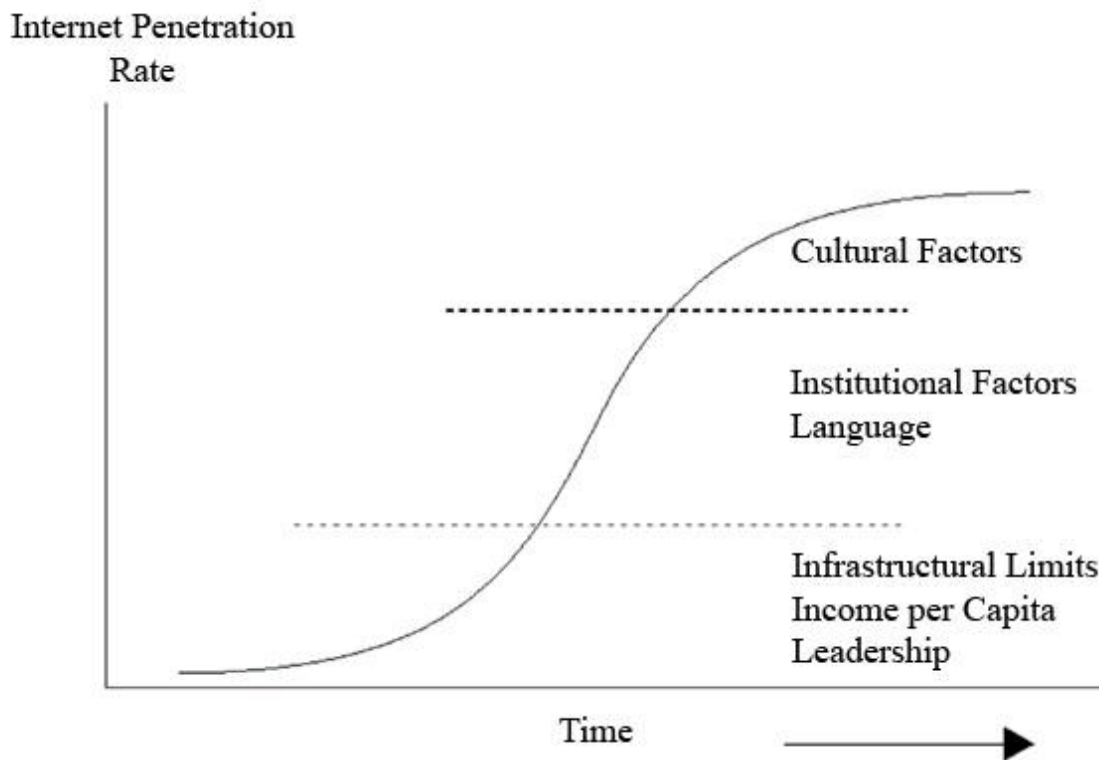


Figure 8. Effects of three groups of factors on the Internet adoption (Hundley, Anderson, Bikson, Dewar, Green, Libicki & Neu, 2000)

As we can see in this figure, the model is presented like this: in the first phase of the Internet diffusion there are infrastructural factors, financial resources and leadership in developing Information Society important for deciding on the engagement on the Internet. This part implies similar development as in Norris’s model together with social and economical and democratization factors in technology diffusion. In the second phase of Internet diffusion, institutional factors are relevant; Norris also presented them as important in the role of mediators (state institutions) between citizens and Internet use. Finally, in the last phase of Internet diffusion, the model supposes that cultural factors play an important role in the diffusion process, which can be understood as similar with the motivation factor in the Norris’s model.

Based on these two models that are presented in two figures above, we can infer that the analysis of the Information Society or Internet diffusion is very complex process that includes a lot of factors. Important to say is that in this thesis it will not be referred to all the factors, and this is one of its limitations. It will be analyzed some of the most important factors, and those are the infrastructural and individual users' factors which concerns Internet diffusion.

### 3.3.1. Digital Divide

As most authors write about it, the Internet generates new ways of communicating that are essential to the new form of society (Information, Knowledge, and Networked Society). The new social reality combined with the new technology is basic elements of the Information Society. This section consists of discussion how the technology is changing the basic infrastructure of society. According to Pedersen (2002), three characteristics of the Internet are of utmost importance when it comes to forming this new social reality. Firstly, the Internet integrates all previous known communications platforms and media (letter, telephony, TV, radio, newspaper, etc.). Secondly, it adds new services for communication and media (storage of information in databases, online meetings, music and video on-demand, etc.). Thirdly, the control of Internet communication is decentralized in contrast to what is often the case with offline communication and media (Pedersen, 2002). The integration of new and well-known forms of communication makes the Internet “a universal media” (Pedersen, 2002).

People's ability to communicate directly to the public through means of the Internet is the feature which is unparalleled in the offline world and is certainly a feature that has a lot of potential. For now it is important to say that “the Internet not only enables one-to-one communication (e-mail) and one-to-many communication (broadcast media), but it is also a communication platform for many-to-many communication and many-to-one communication” (Pedersen, 2002). So, the Internet integrates various forms of communication, decentralizes the control of the media and enables people to communicate and organize in new ways. In brief, the Internet has changed the communication in society and thus the core infrastructure of society.

Because of this, the *principle of access for all* is very important policy objective of national, as well as regional government authorities. This particularly means tackling the digital divide between citizens who do have access to ICT and are ICT-literate, on the one hand, and those who do not have access or the necessary skills, on the other. This is the biggest challenge facing the Information Society in general and electronic services' implementation in particular. This also means that this is extremely relevant aspect that Serbia needs to pay attention to, given the fact what is the economic standard in this country and how Internet diffusion is perceived by its population.

When it comes to the digital divide, according to certain authors (Milanovic, 2003) it is clear that an extremely non-equal distribution of Internet access in the world follows a global economic divide that exist between rich and poor countries and regions. Economic stability, solid financial system, existence of open and competitive market, high extent of entrepreneurial behavior, continual interaction between macroeconomic and structural policies and high level of human capital are some of the factors that can affect the speed with which one country accepts technological innovations (Milovanovic et al., 2005). Furthermore, factors are also: existence of relevant *infrastructure*, as well as other preconditions of technological solutions to be implemented in a local, regional or national context. Along with other factors, economic standard such as level of GDP – which also means individual incomes – that is necessary for using new technologies is an important factor in accepting innovations.

Other important factors that have tremendous effects on digital literacy of potential adopters are basic features of particular culture. This has a huge affect on how that culture shapes its communication patterns. Different cultural patterns are noticeable as global informational network has been developed more. Challenges such as language barriers, as a part of digital divide (Milanovic, 2003), as well as different national norms and traditions, and various extents of openness of different cultural traditions are among factors affecting Internet diffusion. It is clear that if the certain culture is more open, less authoritative, more inventive, tolerant, and educated – the greater is tendency for easier and faster acceptance of new technological solutions or innovations (Milovanovic et al., 2005). Political factors are very important as well. Getting a grip on the fact how important and useful innovations are – can be of great importance for introducing and implementing the innovation. Basically, providing a right *legal framework* that is necessary for innovation penetration, as well as harmonizing organizational, economic and other norms with change that is about to happen, political elites can affect in an important manner the interpretation of innovation, as well as on speed and mechanisms of its adoption (Milovanovic et al., 2005).

Specifically, what needs handling is “the cultural knowledge and readiness for e-delivery, [and] the availability of access to such technology” (Strejcek and Theil, 2002). Getting people online would be only the first challenge. The next task is to maintain and support people’s interest in using the electronic services and to encourage more advanced patterns or methods of use, such as online transactions rather than only downloading of information. The digital inclusion is highly appreciated and needed; and “promoting social inclusion, universal access, and skills acquisition too, are needed in order to bridge over the digital divide” and insure the participation in social, political and economic spheres of the Information Society (Malina, 2003). Good examples of how to puzzle out digital-exclusion challenge include practices such as “special training, and the provision of Public Internet Access Points (PIAPs)” (Millard, 2002).



To sum up, the new social reality is pretty much dependent on the new technology. Internet is the new technology that integrates all previous known communication platforms and media, and therefore needs special attention. People's ability to acquire (or use) computer or computer skills is equally important for governments all over the world because it shows how much particular government care about the implementation of the *principle of access for all*. Together with *economic stability* and *competitive ICT market*, the high level of *human capital* (or skills) of potential adopters and existence of relevant *ICT infrastructure* are required too. Therefore, addressing these issues in the public (government) policies and in the legal framework is absolutely necessary as a first, important step before the implementation itself in the reality.

### 3.4. Summary

In order to make this extensive theoretical framework comprehensible, I will summarize previous two chapters on the Society and Technology, and Innovation, Technology and Internet Diffusion. Firstly, I have analyzed which Information, Knowledge, and Networked Society concepts can be useful in the context of the Serbian case. Inside this chapter I have stressed the fact how important Information Society concepts and ICTs could be if employed in the context of a transition economy such as the Serbian one. I have provided empirical figures and analysis from the researches made by Piatkowski (2003), and Ark and Piatkowski (2004). Inside these analyses, the generalization and the model of transition countries' experiences that want to join EU have been presented. This model implies that transition countries' strategic goal should be to employ gradually higher levels of ICTs in their economy and public institutions' activities. Secondly, I have examined which Innovation, Technology and Internet Diffusion theories can be used to analyze and, if consistently implemented, improve the Serbian case.

Three groups of applicable theories given the theoretical framework that has been provided above are:

- 1) Theories of the *users characteristics* (user perceptions, user beliefs, user attitudes, user intentions, and user training); knowledge barriers and knowledge sharing; cultural knowledge and cultural factors; and finally, ICT literacy and digital inclusion;
- 2) Theories of the national *institutional and infrastructural factors*; the spread of information technology; technological base of society, and infrastructure dependence; and
- 3) Theories of the *convergence of systems* between modern Western countries and the transition countries that have recently joined EU; the rapid technology diffusion conditions, and others.

All of the theories, concepts, and models above mentioned I use to assess the Internet diffusion in Serbia by matching the concepts found in the Serbian institutions' policy documents with what will be presented as operationalized concepts in the chapter on methodology. This is exactly why I have sorted them into the three groups so that concepts could be isolated and therefore explicitly understood and applied. Theories broken into concepts will be used as analytical tools to assess the awareness of the Serbian Government when it comes to the chosen Information Society conceptions, and also how well they have been targeted and applied respectively by relevant institutions in Serbia. Then the other concepts from Internet diffusion and related theories will be applied to assess the current situation of how the Serbian Government addresses the important Internet diffusion factors concerning individual users (actual use of the Internet by citizens, and the mechanisms through which Internet use is expanded, etc.), on the one hand, and national ICT infrastructure (i.e. telecommunication infrastructure, competition on the ICT market, the policies of modernization of ICT infrastructure, etc.), on the other hand. Finally, through the theoretical concepts I will take a look at how the Serbian Government's activities compare to the activities of the other transition countries. More detailed about all the theories and concepts as analytical tools I am about to explain in the Methodology part that is to be presented after this chapter.

## **4. Methodology**

### **4.1. Research Design**

In order to determine whether there is a match between the concepts introduced in the theoretical framework with what is written in the policy documents of the Serbian public institutions that are in charge of Internet diffusion, I need to have a clear methodological path. This path is about to be explicated in this chapter. Furthermore, clear selection criteria and selection of the policy documents itself will be presented in order to decide which documents are relevant for the empirical analysis afterwards. I will choose concrete terms that were already mentioned in the theoretical part and now, in new light, present them operationalized. This is necessary so that what was brought in earlier in the thesis, and what contains variety of definitions, can now be broken up into pieces which are going to be analytical tools how to look at the documents of the Serbian Government and other institutions respectively. Main policy document will be chosen and, based on this, other relevant documents as well. Therefore, in order to have a more precise understanding of concrete policy goals and measures taken, theoretical framework will be converted into key concepts of content analysis and applied to legislative and other acts of Serbian institutions. This is going to be done by measuring how often certain terms show up in the documents. The frequency of terms being mentioned in the documents can tell us about the intention to work on and develop them in the future as well. Moreover, this will be cross-checked by analysis of the other documents subsequently passed by various institutions.

Thus, after the introduction, literature review, and theories that will be used in conducting the empirical research, I am about to define the research design in a sense of research methods and methodology employed in conducting the investigation. Research design is going to answer the question, “How is this research going to be conducted?”, and furthermore, “How can we establish what the Serbian Government is doing at this moment when it comes to promoting ICT infrastructure and Internet diffusion”? In answering these question I will refer to the methods, the type of research (qualitative or quantitative), how I will collect data and from which sources. Not less important is the conception of employment of theories and all the theoretical concepts and aspects that I have analyzed in the theoretical part. When referring to methods and their importance, I bear in mind that methods chosen for a research project are inextricably linked to the research questions posed and to the sources of data collected (Grix, 2004). During the research I also have in mind that research design is not only about specific method(s), but also about the result of how method is being employed, how data are being cross-checked, and finally how they are being collated and analyzed. Since I will also make a distinction between qualitative and quantitative methods, after introducing both of them I will choose the one which is going to be used as the approach to my research topic. To sum up, after introducing the research strategy through referring to the research methods, type of study and theoretical

approach taken, the way in which data collection and data analysis are done will be shown in the sections respectively.

#### **4.2. Research Strategy, Research Method and Type of Study**

Determining the type of study is one of the aims of the methodological part of the research, whether it is going to be descriptive, exploratory or explanatory study (Grix, 2004). Given the fact that the first (descriptive) type of study applies more to a historical subject, and its aim is not to explain the influence of a certain factors in the event on which it is focusing, but to give a detail account of a particular issue, then this is not the only approach to the type of study I conduct. The second (exploratory) type of study is the one that is testing the initial hypotheses, checking for availability of relevant data, determining the variables for a study and assessing the suitability of the case for the further research. Finally, the explanatory study is the type of study in which researcher seeks to make generalizations by extrapolating the case-study's findings to other cases (Grix, 2004). Since I want to conduct a case-study, particularly the research about Internet diffusion and its factors in Serbia, more precise – to describe and explain the Internet diffusion factors – I conduct the descriptive-explanatory type of study.

Therefore, this research is a single, in-depth case-study. Case-study approach is defined as “a specific approach to phenomena through thorough analysis of an individual case” (Grix 2004). To continue with, I want to refer to the distinction between quantitative and qualitative study in order to introduce one or both of them in conducting the research about Internet diffusion. Quantitative research is characterized by three basic phases: “finding variables for concepts, operationalizing them in the study, and measuring them” (Grix, 2004). What is usually associated with the quantitative type of research is that it is interested in finding out numerical qualities of an event, and answering the question: how many, or how much. On the other hand, when it comes to the qualitative research, what is important is that the language of qualitative research tends to revolve around case-studies and social contexts; as well that this type of research involves the *interpretation* of data (Grix, 2004). Qualitative data, as Babbie put it, can be richer in meaning than quantified data. On the other hand, qualitative data bring the disadvantages of purely verbal descriptions (Babbie, 2007). Mentioned richness in meaning can be partly a function of ambiguity (Babbie, 2007). The point is that the same thing does not mean exactly the same for two people; therefore, caution in interpreting is needed, especially when it comes to the socially relevant cases like it is the case with the Internet diffusion in Serbia. I say “socially relevant” because the fact whether someone has computer and Internet access or not today (phenomenon of digital divide) can affect significantly its life. Furthermore, in-depth case study is one of the methods closely affiliated with the qualitative type of research. For the

reasons mentioned, I will use case-study and qualitative approach in analyzing the Internet diffusion in Serbia.

As for the methods being associated with the qualitative research, they are: interview/oral history, observation, and documentary analysis (Grix, 2004). The most important method that I will use in my research is documentary (data) analysis. There is a distinction between primary and secondary document sources since “the primary sources refer to those that have arisen as a product of the actual research process and the secondary sources as interpretations of events by others” (Grix, 2004). Only primary sources will be used in the empirical part of this research.

Since the data in qualitative study are likely to be collected by asking (interviewing), watching (observation), reading (documents) or some combination of three activities (Punch, 2006); the main method for collecting data in this study is going to be the third one, reading and analyzing documents. Furthermore, this study is an unobtrusive research that implies methods of studying social behavior without affecting it (Babbie, 2007). There are three types of unobtrusive research methods: content analysis, analysis of existing statistics, and comparative and historical research (Babbie, 2007). In the content analysis, which I am about to use in my investigation, researcher examines a class of social artifacts that usually are written documents (Babbie, 2007). There are two kinds of content analysis, manifest content (the concrete terms contained in a communication) and latent content analysis (the underlying meaning of communications). I will use both manifest and latent content analysis in order to explain the Internet diffusion and its factors in Serbia based on the chosen concepts from the theoretical framework. In this case, content analysis is much more convenient since undertaking an interview, survey, or some other methods were not feasible at given moment, and this is one of the limitations of my research. Another limitation that could be important and needs to be mentioned is that content analysis is restricted to the examination of recorded communications. Such communication may be written or graphic, but it has to be recorded in a certain way to permit analysis, and therefore can be regarded as insufficient in certain aspects when we compare it to some other methods.

Finally I want to mention shortly the significance of this study from the aspect of the methodological path chosen. *Firstly*, as already explained in details I will use the theories of some of the most well-known authors on the Information, Knowledge and Networked Society (i.e. Castells). This employment of theories is going to be conducted in a way that I will find an implicit agreement among majority of them about where the connections between those theories are in such way that they can be applied in Serbian case. Moreover, I will acknowledge which factors are most commonly addressed when it comes to the Internet diffusion in one country. *Secondly*, since all the conceptions mentioned so far are related to rather general theory on the Information Society and Innovation diffusion, I pay attention to the fact that Internet diffusion context in Serbia is rather specific and that it needs to be dealt according to the development level of this country. Subsequently I will take into account that this is a transition country and

needs to be treated as such. The peculiar situation and development level of transition countries such as Serbia which need to be dealt through looking at certain structural forces and technological drives are explained by Piatkowski. In that sense, I use his theory as it can address the spreading of ICTs in a group of countries that Serbia belongs to as well. *Thirdly*, after bringing in the theories on a general and more specific level, I will find out if there are any references in content of the Serbian institutions' policy documents to what authors from the theoretical framework proposed that should be done in enhancing the Information Society and Internet diffusion. From all mentioned so far, it could be inferred that value of this study is in its emphasis on the most important Information Society and Innovation diffusion theories and their application in conducting the research about Internet diffusion in Serbia. Moreover, the fact that this kind of research has not been done in Serbia can provide an additional significance to what will be the result of the investigation.

### **4.3. Data Collection, Data Analysis and Operationalization of the Concepts**

In order to conduct this research, documents need to be collected and subsequently analyzed. The way in which documents are selected, which means the *selection criteria*, should be thoroughly examined. Firstly, all the documents of the Serbian institutions chosen for the empirical analysis, their subjects and/or content, need to be *connected* with at least one of the theoretical concepts introduced in the second and third chapter of the thesis. Secondly, the chosen document also needs to fulfill the criteria which points out the *date* when the document came into existence. This needs to be in between the date when the first Information Society policy document showed up, on the one hand, and the last document which has shown up in the year when the research is conducted, on the other hand.

Very important is that all the documents need to be indicated in the Methodology chapter so that there can be a clear picture about the scope and specific units of the analysis that are going to be analyzed in the empirical part. The analysis is going to be conducted throughout the contents of the next documents:

- 1) Information Systems Law, 1996;
- 2) E-Government in the Republic of Serbia, 2002;
- 3) Electronic Signature Law, 2004;
- 4) Public Administration Reform Strategy of the Republic of Serbia, 2004;
- 5) National Strategy of the Republic of Serbia for SCG's EU Accession, 2005;
- 6) Information Society Development Strategy, 2006;

- 7) Millennium Development Goals in the Republic of Serbia Monitoring Framework, 2006;
- 8) Newsletter, 2004 (NITIA)
- 9) Newsletter, 2005 (NITIA)
- 10) Newsletter, 2006 (NITIA)
- 11) Internet Network Subsystems, Devices, Equipment, and Installations, 2008.

The institutions that issued these documents are the most relevant Serbian institutions when it comes to the Information Society implementation and Internet diffusion in the country. These institutions are: the Government of the Republic of Serbia, the Parliament of the Republic of Serbia, the Ministry of Telecommunication and Information Society (MTIS), the National Information Technology and Internet Agency (NITIA) and the Telecommunication Agency (RATEL). As it was stated before, in this thesis only documents from primary sources are used. In order to analyze the documents of the abovementioned institutions I will use certain theories and concepts from the theoretical framework and count them to examine the *frequency*, and by it, the intention and responsibility in *implementing* them. Thus, I will mention here all the applicable theories and concepts which I sorted in three groups:

- 1) Theories about the *user characteristics* (user perceptions, user training, user beliefs, user attitudes and user intentions, knowledge sharing and knowledge barriers; ICT literacy, digital inclusion, cultural factors and cultural knowledge).
- 2) Theories about the national *institutional and infrastructural factors* (the spread of information technology, technological base of society, and infrastructure dependence).
- 3) Theories of the *convergence of systems* between the Western countries and the transition countries that have recently joined EU (the rapid technology diffusion conditions, and others).

All of the theories and models mentioned here I use to assess the Internet diffusion in Serbia through analyzing the documents mentioned in the previous paragraphs, finding the operationalized concepts and matching them with the ones above mentioned. There are four questions in the empirical part of the study which are the supportive ones, and a guide in finding an answer to the central research questions. In order to answer to the first empirical question:

*“To what extent does the Serbian government express awareness of the importance of ICT development?”*

I will use Information Society, Knowledge Society and Networked Society concepts to assess the Serbian Government's awareness of the ICT development importance. First of all, I will count in the policy documents the most important concepts from the above mentioned theories, the constructs on which they are founded. These concepts are paradigmatic cornerstones which show us whether the public authorities in one country have the awareness about what the main trends are in the Information Society literature. The fact how many times terms "Information Society", "Knowledge Society" and "Networked Society", among others, are mentioned in the most important policy documents of the Serbian Government can provide us with the basis for the analysis of the Government's awareness of what needs to be implemented if transition country wants to employ gradually more ICTs in its development. Moreover, in the same documents I will look for and count the terms such as: "services", "science", "technology", "ICT", "research and development", "innovation", "human capital", "knowledge diffusion", "market", "ICT market", "networked institutions", "digital literacy", "education", "competition in education sector" and "competition in ICT market". All these constructs are closely related and basically intertwined in creating the foundation of the Information Society conception.

The definitions of all the terms from the previous paragraph will be given now which is the fact that should disable an ambiguity of the concepts' meanings since each of them has many different definitions that can be used pending on the aim of the research conducted. When I refer to *services* I primarily think of the performance and employment in processing, manipulating or transmitting information that are exchanged in a market context (Rule, Besen, 2008). When it is referred to a word *science* in the table it is meant about the scientific basis for appropriate measures to steer the social and technological development (Fleissner, Hofkirchner, 1998). Furthermore, *technology* in this text is defined as not merely a material product, and not merely technological knowledge, but combination of both; and also as the use of scientific knowledge to specify ways of doing things in a reproducible manner (Castells 2000; Montazer, Moghaddam, 2008). By *ICTs* in this thesis I understand technologies that facilitate the capturing, processing, storage, transfer, and presentation of information (Dholakia N., Dholakia R., Kshetri, 2003). By *research and development* I address the activities performed by institutions such as research and development laboratories, government agencies, technology vendors, consulting firms, and user groups which help to determine the level of resources applied to the task of communicating, promoting and enhancing a technology, which have a great deal of impact on the rate of technology diffusion (Fichman, 1999). When I refer to *innovation*, I understand it as an idea, practice, or material artifact perceived to be new by the relevant unit of adoption (Nilakanta, Scamell, 1990; Fichman, 1992). By *human capital* I understand human skills as a factor that can affect the speed with which one country accepts technological innovations (Milovanovic et al., 2005). When addressing the *knowledge diffusion* I understand the social processes of spreading the knowledge in a way of upgrading the human capital (David and Foray, 1995). Another concept that has to be present in the Information Society is the *market* by which I understand automated information networks (governed by interactions between its multiple nodes and



propelled by a combination of market logic and information turbulences) as one of the core activities (together with science and technology, etc.) in the new global economy where all earnings from all activities and countries end up being traded (Castells, 2000). More specifically, by *ICT market* I mean partly the market as it was defined by Castells in the previous definition and partly the component of market segmentation where ICTs are traded. When referred to the *networked institutions* I understand it as the well-rounded and organized institutions and functions that can be described by the concept of e-Government (Rule, Besen, 2002). By *digital literacy* I think of one of the socio-cultural factors that affect the Internet diffusion, and as the means of decreasing the digital divide gap, as well as the precondition for the digital inclusion in a way of providing the human skills needed to use ICT and Internet (Dholakia et al., 2003). When referring to the *education*, I have in mind the most important factor for decreasing the digital divide, and digital illiteracy, on the one hand, and increasing digital inclusion, on the other hand. Furthermore, when fulfilling the structural conditions which can enable the society to use more ICTs and Internet, the *competition* (in ICT and education market) is of essential importance, and I take it as a component of market segmentation where products (ICTs /educational programs) are offered and traded and where there is at least two business parties (preferably as many as possible) competing to gain customers. Finally, the last term that I will use in the first part of the empirical analysis is the *institutional set-up* that can support the *follow-up actions* based on the aforementioned concepts. I will check this by looking at that specific term in the documents and counting it. The institutional set-up I understand as any governmental body or department that is introduced to implement the strategies, plans, concepts or principles that were referred to in that same or some of the previously passed documents.

The documents where I will look for all these terms are all already mentioned ones issued by the Serbian Government, the Parliament of the Republic of Serbia, the Ministry of telecommunication of the Republic of Serbia, the National Information Technology and Internet Agency, and the Telecommunication Agency. Even though the exact concepts are mentioned in this section, in certain cases where exact and clear translations of some terms are difficult to find in Serbian language or they do not exist at all, I will look for identical concepts that express the same meaning rather than exactly translated words or phrases. For example, if it is mention the syntagm “ICT literacy” instead of “digital literacy” it will be taken as identical to the term “digital literacy” while it will be noted in the analytical part afterwards that there is a translation problem in a sense of having different forms but the same meaning. The example of how the analytical table looks like is provided in Figure 9. Once the terms are counted and their numbers put in the table, the analysis of the frequency with which they were mentioned in the policy documents will be provided.

Document Concept	Document 1	Document 2	Document 3
Information society			
Knowledge society			
Networked society			
Services			
Science			
Technology			
ICT			
Research and development			
Innovation			
Human capital			
Knowledge diffusion			
Market			
ICT market			
Networked institutions			
Digital literacy			
Education			
Competition			
Institutional set-up			

Figure 9. The Serbian Government’s awareness of the ICT development

After this, to answer the second empirical question:

*“To what extent does the Serbian government address important diffusion factors concerning individual users?”*

I will use Innovation, Technology and Internet diffusion concepts. The constructs such as “user characteristics”, “user perceptions”, “user needs”, “user training”, “user beliefs”, “user attitudes” and “user intentions”; “adopter’s ability to adopt”, “knowledge sharing” “knowledge barriers”, “institutions for lowering knowledge barriers”, “cultural factors”, “cultural knowledge”, “community of adopters”, “digital literacy”, “digital inclusion”, “digital divide”, “ICT adoption”, and “ICT use” will be used and counted how many times they appear in the above mentioned documents. The same method of the analysis as in the previous research question will be conducted. Before doing that I will give the meanings as I take them in this investigation.

By *user characteristics* I understand user perceptions, user needs, user training, user beliefs, user attitudes, and user intentions. The term “user characteristics” is now broken up into specific analytical units because at the beginning it was formed as one of the groups of theories that were intended to be used in the thesis. By *adopter’s ability to adopt* I refer to the knowledge of the users which provide them with the skills adequate to use ICTs and, in particular, Internet. By *knowledge sharing* I understand the concept of a great relevance for the knowledge society that

refers to engaging individuals in cooperation when it comes to strategic decision making. Since knowledge is a resource located in human mind, and cannot be forced out of people, than will to cooperate is needed in order to build collective wisdom of one organization or society (Kim et al., 1998). As for the *knowledge barriers*, here I refer to the skills necessary for potential adopters to adopt so that they can use ICTs and Internet. By *institutions for lowering knowledge barriers* I refer to all the institutions that can assist individual adopters reaching necessary skills to use ICTs and Internet. When referring to the *cultural factors* I understand the degree of compatibility of the Internet and ICTs with the values and norms of a social system that influences its diffusion patterns in that social system (Dholakia et al., 2003). By *cultural knowledge* I refer to the culturally conditioned norms and values that consist of the readiness of an individual, as part of the social community, to accept the Internet and technological innovations. By *community of adopters* I understand the whole body of the potential adopters of certain technological innovation, in this case – Internet. When referring to the *digital literacy* I understand it as skills necessary to use ICTs and Internet. I refer to the *digital inclusion* whenever making contrast to the concept of the digital divide. *Digital divide* means the divide between citizens who do have access to ICT and are ICT-literate, on the one hand, and those who do not have access and the necessary ICT skills, on the other hand. By *ICT adoption* I understand the acceptance, over time, of some specific item by adopting units (individuals, groups, etc.), linked to specific channels of communication, to a social structure, and to a given system of values, or culture (Katz, Levin, Hamilton, 1963). Finally, when addressing the *ICT use* I refer to the use of technologies that facilitate the capturing, processing, storage, transfer, and presentation of information (Dholakia N., Dholakia R., Kshetri, 2003). The *institutional set-up* is already referred to in the previous research question. These concepts will be looked for in the policy documents, counted, and analyzed respectively in the text. Attention will be paid to the direct translation of some terms just as it was the case with the previous research question. The sample is provided right below this text in Figure 10.

Document Concept	Document 1	Document 2	Document 3
User characteristics			
Ability to adopt			
Knowledge sharing			
Knowledge barriers			
Institutions for lowering knowledge barriers			
Cultural factors			
Cultural knowledge			
Community of adopters			
Digital literacy			
Digital inclusion			
Digital divide			
Income per capita			
ICT adoption			
ICT use			
Institutional set-up			

Figure 10. The Serbian Government's addressing the Internet diffusion concerning individual ICT users

Subsequently, I go answering the third empirical question:

*“To what extent does the Serbian government address questions of national ICT infrastructure?”*

by I looking for, counting and analyzing the terms and concepts such as: “ICT”, “technology”, “technology characteristics”, “ICT market”, “ICT products”, “ICT services”, “competition”, “competition in ICT market”, “telecommunication infrastructure”, “innovation”, “innovation/technology-propagating institutions”, “Internet access”, “access for all”, “digital divide”, “bandwidth”, “bandwidth availability”, “bandwidth infrastructure”, “economic factors”, “economic stability”, “ICT products and services’ price structures”, “the level of GDP”, “human capital”, “tariff/non-tariff barriers”, and “regulatory environment”.

The terms *ICT* and *technology* are already operationalized before, and therefore in answering this research question will be used the same operationalizations as previously described. It is the same with the terms: *ICT market*, *competition*, *competition in ICT market*, *telecommunication infrastructure*, *innovation*, and *digital divide*. When referring to the *technology characteristics* I think of the factor that can facilitate or impede the technology adoption and implementation. When referring to the *ICT products* and *services*, I understand all the commodities or performances offered for sale on the ICT market. By *innovation/technology-propagating*

*institutions* I think about the research and development laboratories, government agencies, technology vendors, consulting firms, and user groups help to determine the level of resources applied to the task of communicating, promoting and enhancing a technology, and therefore can have a great deal of impact on the rate of technology diffusion (Fichman, 1999). By concept *Internet access* I understand the way and means of entering the global network (World Wide Web). By principle *access for all* I mean the conditions such as digital literacy level, level of human capital and ICT infrastructure development; activities on decreasing the digital divide and increasing the digital inclusion, also the competitive ICT market, as well as the extent of development of the institutions in charge for Internet diffusion in country. As for the *bandwidth, bandwidth availability, and bandwidth infrastructure* I take them as some of the most important economic factors that affect the Internet diffusion (Dholakia et al., 2003). By *economic factors* I understand the income level, availability and price structures of ICT products and services, and bandwidth and supporting infrastructures that influence the diffusion of the Internet (Dholakia et al., 2003). *Economic stability* is one of the most important economic factors as well. By *ICT products and services' price structures* I understand the level of prices for the ICT products and services provided on the ICT market. By the *level of GDP* I mean the income level in country and the effects that this factor can have when it comes to the Internet diffusion on the level of individual user. *Human capital* has already been operationalized before. By *tariff/non-tariff barriers* I understand taxes and other charges against citizen's property for the sake of the support of the government. By *regulatory environment* I refer to the framework of rules and principles declared and passed by relevant institutions for the sake of implementing them.

Once I find and make enumeration of how many times these concepts appear in the above mentioned documents of the Serbian Government, the Parliament of the Republic of Serbia, Ministry of telecommunication of the Republic of Serbia, the National Information Technology and Internet Agency, and the Telecommunication Agency. Furthermore, discourse and institutional set-up that was (not) developed will be taken into account and special attention will be put in this direction so that I can assess how much was actually done when it comes to the ICT infrastructure in Serbia. I will do this by putting the syntagm *institutional set-up* in the table and trying to find it inside the documents so that it can tell us if there were some follow-up actions in this direction. The sample table is provided in the continuation of this paragraph.

Document Concept	Document 1	Document 2	Document 3
ICT			
Technology			
Technology characteristics			
ICT market			
ICT products			
ICT services			
Competition in ICT market			
Telecom. infrastructure			
Innovation			
Innov./tech.-prop. instit.			
Internet access			
Access for all			
Digital divide			
Bandwidth			
Bandwidth availability			
Bandwidth infrastructure			
Economic factors			
Economic stability			
ICT price structures			
The level of GDP			
Human capital			
Tariff/non-tariff barriers			
Regulatory environment			
Institutional set-up			

Figure 11. The Serbian Government addressing the issue of the national ICT infrastructure

Finally, in order to answer the last empirical question:

*“How do the activities of the Serbian government in this respect compare to the activities by other governments of similar countries?”*

I will use Piatkowski’s research results about transition countries that joined EU (CEE countries), but also his reference to the SEE countries. I will look for the terms such as ‘ICT hardware investments’, ‘software investments, and ‘telecommunication infrastructure’ in the Serbian Government, the Parliament of the Republic of Serbia, Ministry of telecommunication, the National Information Technology and Internet Agency, and the Telecommunication Agency. By *ICT hardware* I understand the components that build the computer system, and by *ICT hardware investments* I refer to the funds put to build or enhance the computer systems. By *software* I refer to the programs or procedures pertaining to the operation of a computer system that are stored in computer’s memory, and by *software investments* I mean the funds allocated to produce and/or enhance the software. By syntagm *ICT investments in manufacturing industries/service sector* I refer to both ICT hardware and software investments in manufacturing

industries/service sector. By *telecommunication infrastructure* I understand the equipment concerned with the technology of electronic communication at a distance. The outlook of the empirical analysis's table is provided in the Figure 12.

Document Concept	Document 1	Document 2	Document 3
ICT hardware			
ICT hardware investments			
Software			
Software investments			
Telecommunication infrastructure			
ICT investments in manufacturing industries			
ICT investments in service sector			
Institutional set-up as follow-up action			

Figure 12. The Serbian Government, MTIS, NITIA, and RATEL's documents analysis

After addressing all four empirical questions, two more specifications of this thesis are very important to be respected and therefore mentioned at the end of the methodology chapter. The first one is the *validity* and *reliability* of the introduced and operationalized *concepts*. Those two limitations have been tried to be avoided through numerous theories that were presented, and even more of them that had been read. Only after all of them designated in the reference list of the thesis I can say that the minimum of consensus – about what the most important theories are when it comes to the Information Society and Innovation diffusion – is found. In order to follow the main trends among numerous authors, dozens of different theories had to be analyzed and carefully studied. This still does not mean that all of them are read, or that all of them are even reached, but the majority of them are. Secondly, the third one is that not only the *mere existence* of the key concepts and their meanings in the broader sense will be taken into account when analyzing the Internet diffusion in Serbian institutions' documents, but also the level of policy development of a certain issue, and how far the policies have been implemented and with what results when it comes to the certain principle and/or concept in a sense of concrete intentions and follow-up actions (i.e. it will be checked which institutions were presented and introduced, which facts are shared in public by the Government, etc.). Therefore, proclaimed intent in the policies to do something will not be enough to say that Internet diffusion is really achieved in the reality or that actions took place only by being mentioned as policy intentions without policy results. However, we still need to bear in mind that even though if it happens that some concepts were not found inside the documents it does not mean that they have not been implemented, and we need to be careful about it in order not to jump to the conclusions.

Therefore, the extent to which the concepts exist will be checked along the following criteria: firstly, it will be checked for the *existence or non-existence* of the concept itself; secondly I will see which concepts exist in the documents and the *frequency of their appearance* in the same document; thirdly, I will check the concepts that are *present* in the documents as opposed to those that are *missing*; and fourthly, I will analyze the level of policy development of the concept through next criteria: *mere reference* to the principle/concept, proclaimed *willingness* to take actions, elaborated *mechanisms* how to take concrete actions, and *specific action* taken by the relevant public institution with/without reference to the time-frame and evaluation of the results. What is mentioned in the previous criteria means that the first degree of the concept development level is being the lowest, and the fourth degree of the concept development level being the highest because the last one refers to the specific action taken to achieve some goal within given time-frame and evaluations of the results. All this is needed so that the real-life result can be evaluated when it comes to the activities of the Serbian public authorities dealing with the Internet diffusion. After all this, tables will be built to show in a visual and more effective way what was referred to in the methodology chapter, and so it can be more easily presented what the results of this study are. The reason why existence or the non-existence of the chosen terms, concepts and principles are important is because through these we can see the real intention and willingness to implement declared goal, and so that we can find the answers to the research sub-questions, and based on this, the answer to the central research question.



## 5. Empirical Analysis: Internet Diffusion in Serbia

### 5.1. ICT development

In order to answer the central research question, “What are the reasons that Serbia lags behind in terms of Internet diffusion and ICT infrastructure compared to almost all other European countries and what can and should the Serbian Government do to address this issue?”, the seven research sub-questions have been introduced. Four out of seven research sub-questions are related to the empirical analysis of the research and finding out the facts what the situation is in Serbia is when it comes to the Internet diffusion. At the beginning of this study I have posed the question about the awareness of the Serbian Government when it comes to: ICT development, individual ICT users, and national ICT infrastructure respectively; also how do the activities of the Serbian Government in this respect compare to the activities of the other transition countries. In this chapter I will address the next question, “To what extent does the Serbian government express awareness of the importance of ICT development?”

First of all, I will count how many times all the terms and concepts have shown up in the documents that I use, to see if they are only mentioned or they have actually caused some specific measures taken afterwards. Secondly, I look at the institutional set-up and follow-up actions in this sense. Thirdly, I look at the national innovation system, or if there is some institutions that can back up the penetration of innovation and technology in Serbian society since this is referred to as very important previously by some authors (Ernst et al., 1997, theoretical part p. 12).

Therefore, I start counting the operationalized concepts beginning with the document that was basically the first one introducing the information system, but without mentioning the concept of the ‘information society’. That was the *Information System of the Republic of Serbia Law* that was passed by the Parliament of the Republic of Serbia in 1996. This is the document I see as a formal start of introducing information systems in Serbia because this is the first law or legislative act referring to them since the process of break-up of the former Yugoslavia (1989). The new political system and power relations that were introduced in 1989 and wars that subsequently struck all the countries in the region were an obstacle to starting this process earlier. In this document I did not find almost any of the concepts I have introduced in the theoretical framework, be it general ones (Information Society, Knowledge Society, Networked Society, etc.) or more concrete and specific ones (services, digital literacy, ICT market competition, etc.). Since there was basically no follow-up to what was mentioned in this act (functioning and developing the information system and network of the state departments of the Republic of Serbia), we can say that 1990s were pretty restricted when it comes to the strategic

or any other documents on Information Society and ICTs in Serbia. Nevertheless, there were four Government's decrees brought in to regulate the development program and functioning of the information system (1997, 1998, 2000, 2001), and those documents together with the *Information System Law* were the first signs of formal noticing of what is happening in already globalized and networked world, and acknowledging that 'network' will be one of the most important concepts in the 21<sup>st</sup> century in Serbia as well. However, this was not enough to introduce comprehensive measures that are necessary to implement Information Society.

After the social and political changes that happened in October 2000 in Serbia, this country was determined, at least according to the high officials' words, to break-up with the practice of the previous regime (1989-2000). That considered the extensive reforms of all the segments of both the state and society. Certain policy documents referring to the e-Government and the Information Society concepts were introduced. First of all, I think about the *E-Government in the Republic of Serbia* (2002) and the *Electronic Signature Law* passed by the Serbian Parliament in 2004. They were followed by three strategies (*Public Administration Reform*, 2004; *Strategy for EU Accession*, 2005; and *Information Society Development*, 2006), as well by the monitoring framework called the *Millennium Development Goals in the Republic of Serbia* (2006). These policy documents give us an insight into what has been the declared goal, intention, but also and to a certain extent into what is the final result of the Serbian Government when it comes to the Information Society introduction in some relevant societal segments.

Based on what has been said in the methodology part, I will check in these documents whether the awareness was shown about the ICT development. This means that I will check the non-existence/mere existence/frequent existence/existence with certain follow-up action, when it comes to the previously explained theoretical concepts. Thus, once I do the analysis, I will indicate whether these concepts, and theories respectively, were actually recognized or not by the Serbian Government, and if yes – to what extent and with which results.

The concepts for which chosen documents and websites show *high extent* of awareness, and therefore are addressed in other documents as well (not all of them are presented in the table below), are: 'Information Society', 'services', 'technology', 'ICT', 'human capital', 'market', and 'education'. It seems that Serbian public officials and institutions are aware of the concept 'information society' through almost all the referred documents, except for the Law passed in 1990s and the monitoring framework (2006). When it comes to the 'services', it is the same: lesser or medium awareness is shown through most of the documents, except for the Strategies where it has been shown even higher degree of awareness (Strategy of the EU Accession – 206; and IS Development Strategy – 205). The same is for the 'technology' and 'ICT' for which higher extent of awareness is shown by two Strategies (technology: 56, 85; ICT: 17, 134), while almost all the other policy documents show at least some extent of awareness. 'Human capital' as a concept was mentioned in a lesser degree, but still it appears that most of the documents are

aware of it. The 'market' is not mentioned at all, or is only mentioned once (*E-Government in the Republic of Serbia*, and *PA Reform Strategy*) by most of the documents, but in three of them it seems that those public institutions are aware of the importance of this concept (EU Accession Strategy – 223, IS Development Strategy – 60, Millennium Development Goals – 27). The 'education' is mentioned very frequently in the three documents (EU Accession Strategy – 110, IS Development Strategy – 31, Millennium Development Goals – 141), but in all other is not mentioned at all.

Given the documents presented, the concepts that Serbian institutions did not pay attention to at all – or they did it to a *very low extent* – are: 'knowledge society', 'networked society', 'knowledge diffusion', 'networked institutions', 'digital literacy', 'competition in education market', 'competition in ICT market'. The syntagms like 'science', 'research and development', and 'innovation' seem to be recognized by certain number of documents (not more than three of them) but only to a medium or small extent. Finally, the terms 'ICT market', 'digital literacy', and 'competition in ICT market' are referred to a high extent but only by one document (IS Development Strategy), which means that they are not supported as goals or principles in other documents or activities.

Document Concept	Information System Law, 1996 (p. 5)	E-government in the Republic of Serbia, 2002 (p. 32)	Electronic Signature Law, 2004 (15 p.)	PA Reform Strategy, 2004 (p. 60)	National Strategy for SCG's EU Accession, 2005 (p. 207)	Information Society Development Strategy, 2006 (64 p.)	Millennium Development Goals (2006) (p. 80)
Inf. society	0	3	1	3	17	102	0
Knowledge society	0	2	0	0	3	4	0
Netw. society	0	0	0	0	0	0	0
Services	0	5	21	35	206	205	17
Science	0	0	0	0	3	12	6
Technology	0	6	4	11	56	85	2
ICT	0	69	0	4	17	134	0
Research and development	0	0	0	0	11	9	0
Innovation	0	1	0	1	11	10	2
Human capital	0	1	0	12	23	7	7
Knowledge diffusion	0	0	0	0	0	0	0
Market	0	1	0	1	223	60	27
ICT market	0	0	0	0	0	39	0
Netw.institutions	1	9	0	0	0	0	0
Digital literacy	0	0	0	0	0	19	0
Education	0	0	0	2	110	31	141
Competition in education sector	0	0	0	0	0	0	0
Competition in ICT market	0	0	0	0	0	11	0
Institutional set-up	6	9	3	0	0	0	0

Figure 13. Empirical analysis of the frequency of the mentioned concepts in the Serbian Government and Parliament's policy documents

When it comes to the institution particularly in charge of introducing the Information Society and Internet in Serbia (National Information Technology and Internet Agency – NITIA), we should check for the same terms and concepts to find out what is the awareness of this institution presented in its documents. We will check it by referring to its newsletters where we can actually see what were the most important activities of this institution for previous years and how do the theoretical concepts match with the priorities of this institution. As for the concepts that were mentioned *most often*, and therefore we can say that the NITIA has the awareness about these concepts are: information society (29, 15, 9); science (12, 2, 3); technology (32, 14, 5); ICT (21, 27, 0). Also to a lower extent – ‘digital literacy’ is mentioned (4, 1, 2). Furthermore, to a certain extent – ‘services’ were mentioned as well (4, 3, 4), and ‘education’ (3, 0, 0). On the other hand, when it comes to the concepts that attention was paid only to *very low extent*, those are:

‘knowledge society’, ‘networked society’, ‘service sector’, ‘research and development’, ‘innovation’, ‘human capital’, ‘knowledge diffusion’, ‘market’, ‘ICT market’, ‘networked institutions’, ‘competition in education/ICT market’.

Document Concept	“Newsletter”, 2004	“Newsletter”, 2005	“Newsletter”, 2006	“Internet Network Subsystems, Devices..”, 2008
Inf. society	29	15	9	0
Know. society	1	1	0	0
Netw. society	0	0	0	0
Services	4	3	4	0
Science	12 <sup>3</sup>	2 <sup>4</sup>	3	0
Technology	32	14	5	0
ICT	21	27	0	0
R. and D.	0	0	0	0
Innovation	0	0	0	0
Human capital	0	1	0	0
Knowledge diffusion	0	0	0	0
Market	1	0	0	0
ICT market	0	0	0	0
Netw.institutions	0	0	0	0
Digital literacy	4	1	2	0
Education	3	0	0	0
Competition in education sector	0	0	0	0
Competition in ICT market	0	0	0	0
Institutional set- up	0	0	0	0

Figure 14. Empirical analysis of the frequency of the mentioned concepts in the National Information Technology and Internet Agency (NITIA)

The conclusion to this chapter is that the Serbian Government shows rather high extent of awareness about concepts like ‘information society’, ‘services’, ‘technology’, ‘ICT’, ‘human capital’, ‘market’, and ‘education’, which are basically a bit broader and general conceptions connected to the term of Information Society. On the other hand, the concepts that were recognized only to a certain extent and therefore not really worked out and implemented further

<sup>3</sup> The word “science” was found in this document only as an integrative part of syntagm “Ministry of Science and Environment Protection”.

<sup>4</sup> The word “science” was found in this document only as an integrative part of syntagm “Ministry of Science and Environment Protection”.

in the actions of the institutions are: 'science', 'research and development', and 'innovation'. Also, the concepts like 'ICT market', 'digital literacy', and 'competition in ICT market' are mentioned only in one document, but not by other supportive documents which means that they did not really have the follow-up actions once the strategic document (*IS Development Strategy*) was introduced. On the other hand, the terms and concepts that were mentioned the least are: 'knowledge society', 'networked society', 'knowledge diffusion', 'networked institutions', 'digital literacy', 'competition in education/ICT market'. Not only that these concepts did not have the follow-up actions or institutional-set up to support them, but so far they were not even recognized as important by Serbian institutions, or at least not to a significant extent.

When it comes to the institution particularly in charge of implementing the Information Society in Serbia, situation is similar to what was presented in the Government's documents: higher or medium extent of awareness about 'information society', 'science', 'technology', 'ICT', 'services', and 'education'. 'Digital literacy' is mentioned as well, but only to a certain extent. The terms about which very low extent, or no awareness was shown at all, are (again): 'knowledge society', 'networked society', 'service sector', 'research and development', 'innovation', 'human capital', 'knowledge diffusion', 'market', 'ICT market', 'networked institutions', 'competition in education/ICT market'.

To sum up, after checking the operationalized terms and concepts in the policy documents of the Serbian Government and other public institutions in order to analyze the awareness of the importance of the ICT development, we can say that there are three groups of concepts pending on the extent to which the Government shows its consciousness of. In the first group are more general and broader terms like 'information society', 'technology', 'market' and others about which Serbian institutions show high extent of awareness. In the second group are terms such as 'science', 'research and development', 'innovation' and others about which the Serbian Government show awareness only to a certain extent, without too much effort to work on implementing them further. Finally, in the third group are terms as 'knowledge society', 'networked society', 'knowledge diffusion', 'ICT market', 'networked institutions', 'competition in education market', and 'competition in ICT market' about which the Serbian Government and other institutions show *the least* effort to understand or implement them. Knowledge society and Networked society concepts as mentioned by Lundvall (2006) and Stiglitz (1999) are the most important concepts which need to be apply fully and with all its subconcepts if country wants to achieve the higher developmental stage, that is "a learning economy" and "weightless economy". Therefore, knowledge diffusion together with networked institutions and developed and competitive ICT and education market (David and Foray 1995, etc.); among others, can bring transition country such as Serbia to a higher level of development.

## 5.2. ICT Users

In order to answer to the next empirical research question, I will look for the concepts made by authors of Innovation, Technology and Internet diffusion theories. The question is following one: To what extent does the Serbian government address important diffusion factors concerning individual users? To answer this I will go deeper into user characteristics theory, which considers the terms such as ‘user needs’, ‘user perceptions’, ‘user training/education’, ‘user beliefs’, ‘user attitudes’, and ‘user intentions’. Furthermore, if innovation is supposed to be spread in society, potential adopters need to have certain skills and ability to adopt new technology, in this case ICTs and Internet. Therefore, knowledge and knowledge sharing, as well as institutions for decreasing knowledge barriers is emphasized by many authors and theories which I have analyzed and discussed in the theoretical part of this thesis (Kim et al., 1998; theoretical part, p. 12; Fichman, 1992; theoretical part, p. 24) Other than this, cultural factors and cultural knowledge are also important factors which can affect the individual user how to behave when it comes to the ICT adoption. Moreover, I am going to look for the digital literacy and the income per capita, concepts which essentially decide on the digital inclusion/digital divide when it comes to individual users, so that I can see if these constructs were something that attention was paid to. Moreover, I will check the syntagm ‘community of adopters’, and ‘ICT adoption’ and ‘ICT use’ to see if public institutions in Serbia considered these aspects so far in their strategies. In the first part of this section I will go for the same documents which I examined in the previous part about ICT development (but different concepts now), all of them issued by the Serbian public institutions (the Serbian Government, the Parliament of the Republic of Serbia, the Ministry of Telecommunication and Information Society, and the National Information Technology and Internet Agency).

In the theoretical part I have divided concepts into three groups in order to use better all the terms previously operationalized. The first group of concepts is about user characteristics such as user perception and training, but also cultural factors, income per capita, and the extent to which users use the ICTs. This group of concept will be divide here, in the empirical part, in three sub-groups so that we can see which concepts are mentioned quite often, on the one hand, and which terms are mentioned only from time to time (or are not mentioned at all) without any deep understanding or determination to work further on implementing them.

The first sub-group are terms that are mentioned often and therefore can be taken as concepts that the Serbian Government and other institutions have *awareness* about. These concepts are: ‘user characteristics’ (rights and responsibilities), ‘user needs’, and ‘knowledge sharing’. The term ‘user characteristics’ is mentioned relatively often - 27 times in Electronic Signature Law, and 3 times in IS Development Strategy; while the concept ‘user needs’ is mentioned 10 and 34 in the *E-government in the Republic of Serbia* and *IS Development Strategy* respectively. The term ‘knowledge sharing’ (in this and other connected forms and meanings) is mentioned in the

four documents (*E-government in the Republic of Serbia*, *PA Reform Strategy*, *EU Accession Strategy*, *IS Development Strategy* and the *Millennium Development Goals*) – 2, 3, 19, 17, and 3 times respectively.

The second sub-group consists of the terms that are mentioned only for *few times* each (in more than one document) and therefore cannot be regarded as the ones that high extent of awareness is shown about. Having been mentioned only for few times is not being enough to develop and in-depth understand concepts which basically means that they will not have bright future when it comes to their further implementation. However, this will be checked in other relevant documents and institutional set-up which will tell us how seriously these concepts were actually taken into account. The terms that I just referred to are: ‘user training’, ‘(adopter’s) ability to adopt’, ‘institutions for lowering knowledge barriers’, ‘cultural factors’, and ‘digital literacy’. The term ‘user training’ is mentioned only in *PA Reform Strategy* (3 times) and in the *Millennium Development Goals* (1). The ‘adopter’s ability to adopt’ is noticed in three documents [*Electronic Signature Law* (3), *EU Accession Strategy* (1), and *IS Development Strategy* (1)]. ‘Institutions for lowering knowledge barriers’ are mentioned in two documents – *E-government in the Republic of Serbia* (1), and *EU Accession Strategy* (3). The concept of ‘cultural factors’ is mentioned in three documents (*PA Reform Strategy* (2), *EU Accession Strategy* (5), and *IS Development Strategy* (1)). Finally, the concept of ‘digital literacy’ is referred to in two documents – *IS Development Strategy* (5) and *Millennium Development Goals* (1) respectively. What is important to notice here is that even though very significant concepts such as ‘user training’ and ‘institutions for lowering knowledge barriers’ are referred to in few documents they are not mentioned in the most important one when it comes to the IS introduction and that is *IS Development Strategy*.

Finally, the third sub-group consists of terms that are mentioned only in one document or they are *not mentioned* at all. The fact that some of the concepts are mentioned only in one document is not enough to say that policy-makers in some country are aware of its existence in a way that these constructs will be implemented in their actions in the near future. Therefore, I have chosen to put these concepts in the third group even though they might show up in some other policy texts. That is exactly why other policy texts and relevant institutions and sources will be checked as well. Therefore, the concepts not being mentioned at all in the documents are: ‘user perceptions’, ‘user beliefs’, ‘user attitudes’, and ‘user intentions’. Therefore, we can say that individual users when it comes to their perceptions, beliefs, attitudes, and intentions are not taken seriously. This means that it has not been worked out a strategy or some other policy document about how to approach this social group and communicate the benefits and responsibilities of ICT adoption and ICT use. As for the concepts being used only in *one* policy document without any significant follow-up action, they are the following: ‘knowledge barriers’ (1), ‘cultural knowledge’ (9), ‘community of adopters’ (2), ‘digital inclusion’ (1), ‘digital divide’ (4), ‘income per capita’ (8), ‘ICT adoption’ (1), and ‘ICT use’ (35). Again, it is mentioned that some of the



concepts like ‘knowledge barriers’ and ‘income per capita’ are mentioned in some other documents, but not in the core document for modernizing the Serbian Information Society, and that is the *IS Development Strategy*. The numerical results are presented in the table below (Figure 15).

Document Concept	Information System Law, 1996 (p. 5)	E-government in the Republic of Serbia, 2002 (p. 32)	Electronic Signature Law, 2004 (15 p.)	PA Reform Strategy of the Republic of Serbia, 2004 (p. 60)	National Strategy of for SCG's EU Accession, 2005 (p. 207)	Information Society Development Strategy, 2006 (64 p.)	Millennium Development Goals (2006) (p. 80)
User character.	0	0	27	0	0	3	0
User needs	0	10	0	0	0	34	0
User perceptions	0	0	0	0	0	0	0
User training	0	0	0	3	0	0	1
User beliefs	0	0	0	0	0	0	0
User attitudes	0	0	0	0	0	0	0
User intentions	0	0	0	0	0	0	0
Ability to adopt	0	0	3	0	1	1	0
Knowledge sharing	0	2	0	3	19	17	3
Know. barriers	0	1	0	0	0	0	0
Institutions for lowering know.barriers	0	1	0	0	3	0	0
Cultural factors	0	0	0	2	5	1	0
Cult. knowledge	0	0	0	0	0	9	0
Community of adopters	0	0	0	0	0	2	0
Digital literacy	0	0	0	0	0	5	1
Digital inclusion	0	0	0	0	0	1	0
Digital divide	0	0	0	0	0	4	0
Income per capita	0	0	0	0	0	0	8
ICT adoption	0	0	0	0	0	1	0
ICT use	0	0	0	0	0	35	0
Inst. set-up	0	0	3	0	0	0	0

Figure 15. Empirical analysis of the frequency of the concepts mentioned in the Serbian Government and Parliament's documents

When it comes to the documents of the National Information Technology and Internet Agency, I will divide observed concepts in two groups. One group will consist of the terms that are mentioned in more than one document, while the other group will consist of the terms from that are not mentioned at all or that are only mentioned in one document (without any support or follow-up from other documents). The first grouping of terms, which are mentioned in more than one document, consists of concepts such as ‘user training/education’ [*Newsletter 2004* (1),

*Newsletter 2005* (3), and *Newsletter 2006* (1)]; ‘knowledge sharing’ [*Newsletter 2004* (5), and *Newsletter 2005* (3)]; ‘digital literacy’ [*Newsletter 2004* (4), *Newsletter 2005* (1), and *Newsletter 2006* (2)]; and ‘ICT use’ [*Newsletter 2004* (9), and *Newsletter 2005* (7)]. The second grouping of terms consists basically of all the other terms. They are: ‘user characteristics’ [*Newsletter 2004* (1)], ‘user needs’ [*Newsletter 2005* (2)], ‘user perception’ (0), ‘user beliefs’ (0), ‘user attitudes’ (0), ‘user intentions’ (0), ‘adopter’s ability to adopt’ [*Newsletter 2004* (2)], ‘knowledge barriers’ (0), ‘institutions for lowering knowledge barriers’ (0), ‘cultural factors’ (0), ‘cultural knowledge’ (0), ‘community of adopters’ (0), ‘digital inclusion’ (0), ‘digital divide’ (0), ‘income per capita’ (0), and ‘ICT adoption’ (0).

Document Concept	“Newsletter”, 2004	“Newsletter”, 2005	“Newsletter”, 2006	“Internet Network Subsystems, Devices...”, 2008
User character.	1	0	0	0
User needs	0	2	0	0
User perceptions	0	0	0	0
User training	1	3	1	0
User beliefs	0	0	0	0
User attitudes	0	0	0	0
User intentions	0	0	0	0
Ability to adopt	2	0	0	0
Knowledge sharing	5	3	0	0
Know. barriers	0	0	0	0
Inst. for lowering knowledge barriers	0	0	0	0
Cultural factors	0	0	0	0
Cult. knowledge	0	0	0	0
Comm. of adopters	0	0	0	0
Digital literacy	4	1	2	0
Digital inclusion	0	0	0	0
Digital divide	0	0	0	0
Income (per capita)	0	0	0	0
ICT adoption	0	0	0	0
ICT use	9	7	0	0
Institutional set-up	0	0	0	0

Figure 16. Empirical analysis of the frequency of the concepts mentioned in the NITIA’s documents

To conclude this chapter I can say that there are terms about which the Serbian Government shows relatively higher extent of awareness. Those terms are mostly the following: user characteristics and needs, and knowledge sharing; and to a certain extent – user training, adopter’s ability to adopt, institutions for lowering knowledge barriers, cultural factors and digital literacy. As for the concepts *not* mentioned at all in the Serbian Government’s documents,

they are the following: user perceptions, beliefs, attitudes, and intentions; and also the concepts mentioned only in *one* document – knowledge barriers, cultural knowledge, community of adopters, digital inclusion, digital divide, income per capita, ICT adoption, and ICT use. Now comparing what was mentioned in the Serbian Government’s documents, on the one side, and NITIA’s documents, on the other side, we can say that some of the concepts that had been mentioned in the Government’s texts were never mentioned later by the specific bodies created for implementing the Information Society conditions. First I will refer to the concepts that actually had some follow up and can be considered as the ones that will be perhaps taken seriously in the future as well. Those are: user training and education, knowledge sharing, digital literacy and ICT use.

On the other hand, I will present the list of concepts that did not get the chance to be in-depth understood or implemented in the actions of the particular bodies: user characteristics, needs, perceptions, beliefs, attitudes, intentions, adopter’s ability to adopt, knowledge barriers and institutions for lowering the knowledge barriers, cultural factors, cultural knowledge, community of adopters, digital inclusion, digital divide, income per capita, and ICT adoption. Therefore, the concepts that were not actually taken seriously or which were not even tried to be understood cannot be considered as areas in which respective country will have significant results in the future if the most important policy texts are going to stay as they are now. Except for the concept related to the knowledge diffusion, which was the case in the previous question as well, we see that all the above mentioned user characteristics – needs, perceptions, beliefs, attitudes, intentions, and adopter’s ability to adopt – are disregarded in the policy documents. On the other hand, this is what was particularly emphasized by certain authors (Burton-Jones, Hubona, 2006) to be the most important factors of Internet diffusion in the community of adopters.

### **5.3. National ICT Infrastructure**

After answering the first two empirical research questions, I will go further – now to investigate what is the current situation with national ICT infrastructure and how the Serbian Government handles this issue. The third empirical research question is the following one: “To what extent does the Serbian government address questions of national ICT infrastructure?” In order to give an answer to this question I will take concepts from the theoretical part again. There are going to be three groups of concepts. The first group is related to the current situation of ICT and other technology, technology characteristics, ICT market and products, competition, etc. The second group of concepts in this infrastructure issue is the one related to the technical details and infrastructure itself, such as internet access (*access-for-all* principle), bandwidth availability and infrastructure, digital divide, and others. The third group of concepts used to describe the situation in infrastructure field is related to the economic factors, economic stability, ICT

products and services' prices, the level of GDP, tariff and non-tariff barriers and regulatory environment. However, in referring to these concepts in the analysis I will look to the frequency of their appearance in the documents in order to emphasize what were the concepts that the Serbian Government and other institutions stressed in comparison to the concepts that were not mentioned at all. That is exactly why I grouped results into three levels so that it can be accentuated to what extent Serbian institutions addressed the questions of the ICT infrastructure.

The first group consists of concepts presented in all or almost *all documents* (5, 6 or 7 – out of 7 of them introduced in the table). These concepts are: 'technology', 'telecommunication infrastructure', 'innovation', 'economic factors', and 'human capital'. As for the 'technology' it has been mentioned quite often in six documents [*E-government in the Republic of Serbia* (6), *Electronic Signature Law* (4), *PA Reform Strategy* (11), *EU Accession Strategy* (56), *IS Development Strategy* (85), and *Millennium Development Goals* (2)]. The syntagm 'telecommunication infrastructure' is put forward in all of the previously mentioned documents (except the Millennium Development Goals) the following number of times: 3, 7, 3, 5, 1, and 80 respectively. A bit lower extent to which the term 'innovation' is mentioned does not change the fact that it has been noticed and designated in five out of seven documents in the table (number of times mentioned: 1, 1, 11, 10, and 2). The term 'economic factors' is also quite often indicated in the texts; five out of seven documents incorporate this term as well (no. of times: 6, 9, 143, 13, and 11). Finally, the syntagm 'human capital' is mentioned in five out of seven documents too (no. of times being mentioned: 1, 12, 23, 7, and 7).

Before analyzing the second group of concepts there are some specific cases that I would like to mention here. The terms such as: 'ICT' (mentioned 224 times in total, but only 4 documents), 'ICT services' (mentioned 211 times, but only 4 documents), and 'Internet access' (mentioned 71 times, but only in 2 documents) basically belong to the second group of concepts but I think that they should be put here in between the first and the second group. This is because, on the one hand (which makes them closer to the second group), they are mentioned in more than one document and not more than four of them, and on the other hand (which makes them close to the first group as well), they are mentioned quite a number of times in the particular documents (although not enough documents so that these concepts can be put in the first group).

The second group of concepts consists of the constructs mentioned in more than one document but not more than four of them. These are the concepts that can be indicated as the ones with *not too much emphasis* on them (neither by the number of documents where they were mentioned, nor by the number of times being mentioned in the documents themselves). They are: 'technology characteristics', 'ICT products', 'competition', 'innovation/technology-propagating institutions', 'economic stability', 'ICT products and services' price structures', 'tariff/non-tariff barriers', and 'regulatory environment'. As for the 'technology characteristics', it has been mentioned in two documents [*EU Accession Strategy* (23), and *IS Development Strategy* (2)].

The syntagm 'ICT products has been mentioned in two policy texts as well [*Electronic Signature Law* (1), and *IS Development Strategy* (23)]. As for the word 'competition' it was mentioned more times than almost all the other concepts in this group (in total 65 times, by documents: 2, 45, 15, and 3). The term 'innovation/technology-propagating institutions' it was mentioned in two documents (no. of times: 1, 10), just as the term 'economic stability' (2, 9). The concept 'ICT products and services' prices and structures' was referred to in four different documents but in three of them only once (1, 1, 1, and 4). The 'level of GDP' is put forward in two documents, with reference to it of 52 and 24 times (*EU Accession Strategy* and *Millennium Development Goals*). Finally, the last two concepts in this group are tariff and non-tariff barriers, and regulatory environment. As for the former one, barriers, taxes and such are mentioned 76 times in four documents, but most of them refer to the non-ICT taxes (61/76). As for the later concept, 'regulatory environment' it is mentioned 59 times in four documents.

The third group of concepts refers to the constructs mentioned in *none* of the documents, or in only one of them. This basically means that even if they were mentioned in one document it did not really have an impact later or caused any follow up action. These concepts are: 'ICT market', 'competition in ICT market', 'access for all', 'digital divide', 'bandwidth', 'bandwidth availability', 'bandwidth infrastructure', and 'the level of GDP'. As for the term 'ICT market', it has been mentioned quite often in the *IS Development Strategy* (35 times), but without any effect in follow-up documents which were analyzed as well. The syntagm 'competition in the ICT market' is mentioned 11 times in the same strategy, but with no significant effects afterwards. The principle 'access for all' is designated only one time in one document (*IS Development Strategy*) out of seven of them in the table. As for the 'digital divide' it is almost the same, because it was mentioned four times in one document but with no support in other texts. The term 'bandwidth' and two other connected terms are mentioned in total 43 times inside only one document (*IS Development Strategy*).

Document \ Concept	Information System Law, 1996 (p. 5)	E-government in R. Serbia, 2002 (p. 32)	Electronic Signature Law, 2004 (15 p.)	PA Reform Strategy of the R. of Serbia, 2004 (p. 60)	Nat. Strat. for SCG's EU... (p. 207)	IS Development Strategy, 2006 (64 p.)	Millennium Development Goals (2006) (p. 80)
ICT	0	69	0	4	17	134	0
Technology	0	6	4	11	56	85	2
Tech. characteristics	0	0	0	0	23	2	0
ICT market	0	0	0	0	0	35	0
ICT products	0	0	1	0	0	23	0
ICT services	0	10	22	0	0	179	0
Competition	0	0	0	2	45	15	3
Competition (ICT)	0	0	0	0	0	11	0
Telecomm. infrastructure	3	7	3	5	1	80	0
Innovation	0	1	0	1	11	10	2
Inn./tech.-prop. institutions	0	0	0	0	1	10	0
Internet access	0	0	0	0	3	68	0
Access for all	0	0	0	0	0	1	0
Digital divide	0	0	0	0	0	4	0
Bandwidth	0	0	0	0	0	22	0
Bandwidth availability	0	0	0	0	0	6	0
Bandw. infrastructure	0	0	0	0	0	15	0
Economic factors	0	6	0	9	143	13	11
Economic stability	0	0	0	2	9	0	0
ICT price structures	0	1	1	0	1	4	0
The level of GDP	0	0	0	0	52	0	24
Human capital	0	1	0	12	23	7	7
Tariff/non-tariff barriers	0	0	0	54 <sup>5</sup>	14	7 <sup>6</sup>	1
Reg. environment	0	0	0	11	15	32	1
Institutional set-up	8	11	5	0	0	9	0

Figure 17. Empirical analysis of the frequency of the concepts mentioned in the Serbian Government and Parliament's documents

As for the information provided on the website of the National Information Technology and Internet Agency through their newsletters I will divide them in groups. This information will be actually checked concepts and I will split them according to the frequency of their appearance in the documents. Basically I will take the same methodology as in the five previous tables, put concepts in two groups pending on the fact whether they show up often and sometimes (meaning more than in only one document), or they show up only in one document/do not show up at all (in this last group is also included the concept that was mentioned only once without referring to it any further).

The concepts in the first groups where the constructs show most often in all or almost all documents are: 'ICT', 'technology', 'technology characteristics', 'ICT products', 'ICT services', 'telecommunication infrastructure', 'innovation/technology-propagating institutions', 'bandwidth infrastructure', 'economic factors' and 'regulatory environment'. The term 'ICT' shows up in

<sup>5</sup> Non-ICT tax.

<sup>6</sup> Non-ICT tax.

two newsletters (no. of times: 21, 27). The concept 'technology' was mentioned in all four documents (no. of times: 32, 14, 5, and 3). The syntagm 'technology characteristics' was mentioned in all four documents as well (4, 4, 4, and 7). The 'ICT products' are mentioned in two newsletters (6, 2). ICT services are being mentioned in three newsletters (4, 3, and 4). The syntagm 'telecommunication infrastructure' was mentioned quite often, in all four documents (19, 15, 2, and 5). As for the 'innovation/technology-propagating institutions', they are mentioned in all the newsletters (5, 4, and 1 respectively). The term 'bandwidth infrastructure' was mentioned only in two documents, 5 times in one (year 2005), and 1 time in the other newsletter (2006). The syntagm 'economic factors' are mentioned in two newsletters (1, 3). Finally, the 'regulatory environment' is mentioned in two documents as well, in two newsletters (3, 2).

As for the second group where I put all the concepts that were mentioned only in one document or were not mentioned at all, I will place these constructs: 'ICT market', 'competition', 'competition in ICT market', 'innovation', 'Internet access', 'access for all', 'digital divide', 'bandwidth', 'bandwidth availability', 'economic stability', 'ICT products and services' price structure', 'the level of GDP', 'human capital', and 'tariff/non-tariff barriers'. Most of the concepts that I just mentioned are not indicated a single time in none of the four presented documents. Actually, this is the case with all the aforementioned terms except for: 'bandwidth' (mentioned once), 'ICT products and services' price structure' (1) and 'human capital' (1), which basically were not mentioned in a manner or with intention to produce any follow-up action later. The data are presented in the table below (Figure 18).

Document Concept	“Newsletter”, 2004	“Newsletter”, 2005	“Newsletter”, 2006	“Internet Network Subsystems...”, 2008
ICT	21	27	0	0
Technology	32	14	5	3
Technology characteristics	4	4	4	7
ICT market	0	0	0	0
ICT products	6	2	0	0
ICT services	4	3	4	0
Competition	0	0	0	0
Competition in ICT market	0	0	0	0
Telecommunication infrastructure	19	15	2	5
Innovation	0	0	0	0
Innovation/technology-propagating institutions	5	4	1	0
Internet access	0	0	0	0
Access for all	0	0	0	0
Digital divide	0	0	0	0
Bandwidth	0	0	1	0
Bandwidth availability	0	0	0	0
Bandwidth infrastructure	0	5	1	0
Economic factors	1	3	0	0
Economic stability	0	0	0	0
ICT products and services' price structures	1	0	0	0
The level of GDP	0	0	0	0
Human capital	0	1	0	0
Tariff/non-tariff barriers	0	0	0	0
Regulatory environment	3	2	0	0
Institutional set-up	0	0	0	0

Figure 18. Empirical analysis of the frequency of the concepts mentioned in the NITIA's documents

In order to conclude this chapter I will refer again to the documents provided by both the Serbian Government and the institution particularly in charge of introducing the Information Society in Serbia (NITIA). Based on what was provided so far in the analytical part of this chapter about the concepts presented in the documents of both institutions, I will draw following conclusions. Referring once more to the terms that were mentioned quite often in both documents I can say that there is certain extent of similarity between them. Referring to the quite general terms such as ‘technology’, ‘telecommunication infrastructure’, ‘ICT services’, ‘economic factors’ and others, and in the same time not going into details are pretty much characteristics of all these documents. Keeping the subject on rather general level while mentioning them quite often is therefore feature of almost all the documents I have analyzed in this thesis. On the other hand, the concepts that are essential when it comes to the authors and theories I have introduced in the theoretical chapters are either not mentioned at all or they are mentioned in a very insignificant way and very rare. More often they are not being mentioned at all in comparison to the cases when they are mentioned once. The terms ‘ICT market’, ‘competition in ICT market’, ‘access for all’, ‘digital divide’, ‘bandwidth’, and ‘bandwidth availability’ are the ones that I indicate. These



concepts and principles are some of the most important drives when it comes to the introducing the Information Society, on the one hand, and Innovation, Technology and Internet diffusion processes, on the other hand (Pedersen, 2002; Dholakia et al., 2003; Milanovic, 2003; etc.). Not being aware of those concepts or not wanting to indicate, understand and implement them respectively as some of the most important Information Society and Internet diffusion conditions can have, and actually does have, important effects on the Serbian society when it comes to the Internet diffusion.

#### **5.4. Serbia, Transition Countries, and ICT Investments**

In order to answer the last empirical question: “How do the activities of the Serbian government in this respect compare to the activities by other governments of similar countries?” I will assess the Serbian Government’s awareness of the *investments in the ICT hardware, software and telecommunication equipment*. Thus, investments in all these fields together with *ICT investments in manufacturing industries and service sector* are going to be checked. I will use documents and data provided on the websites of the Serbian institutions such as the Serbian Government, the Parliament of the Republic of Serbia and the National Information Technology and Internet Agency to answer this question. Furthermore, I will use Piatkowski’s research results about transition countries that joined EU (CEE countries), but also study made by him about SEE countries.

After looking at the documents and data provided on the websites of the Serbian institutions I realized that terms such as ‘ICT hardware’, ‘software’, and ‘telecommunication infrastructure/equipment’ were mentioned quite often, and on a more general level in comparing to the other provided terms. Other terms – ‘ICT hardware investments’, ‘software investments’, ‘ICT investments in manufacturing industries’, and ‘ICT investments in service sector’ are mentioned less number of times and in not so high number of documents. The terms ‘ICT hardware investments’ and ‘software investments’ were mentioned in three documents each, while ‘ICT investments in manufacturing industries’ and ‘ICT investments in service sector’ were mentioned in one and two documents respectively.

Document Concept	Information System of the Republic of Serbia Law, 1996 (p. 5)	E-government in the Republic of Serbia, 2002 (p. 32)	Electronic Signature Law, 2004 (15 p.)	Public Administration Reform Strategy of the Republic of Serbia, 2004 (p. 60)	National Strategy of the Republic of Serbia for SCG's EU Accession, 2005 (p. 207)	Information Society Development Strategy, 2006 (64 p.)	Millennium Development Goals in the Republic of Serbia (Monitoring Framework, 2006) (p. 80)
ICT hardware	17	8	2	1	0	16	0
ICT hardware investments	0	4	0	0	0	21	1
Software	29	48	138	3	4	116	0
Software investments	0	5	0	0	0	9	1
Telecommunication infrastructure	10	5	3	2	9	80	0
ICT investments in manufacturing industries	0	0	0	0	1	0	0
ICT investments in service sector	0	0	0	0	1	5	0
Institutional set-up	0	2	3	0	0	0	0

Figure 19. The analysis of the Serbian Government and respective institutions' documents

As for the documents found on the website of the National Information Technology and Internet Agency, I can say that the situation is almost the same as with the Serbian Government's documents. Namely, 'ICT hardware', 'software', and 'telecommunication infrastructure' were mentioned more often than the other terms. When it comes to the investments and awareness about investments it is obvious from the provided table that only 'zeros' are present. Given this data, the results can help us understand Piatkowski's study about CEE and SEE countries and Internet penetration rate in all the countries from these two regions. Right after the table where the analysis of the NITIA's documents is placed, I will present the results from Piatkowski's research.

Document Concept	“Newsletter”, 2004	“Newsletter”, 2005	“Newsletter”, 2006	“Internet Network Subsystems, Devices, Equipment, and Installations”, 2008
ICT hardware	2	2	1	0
ICT hardware investments	0	0	0	0
Software	27	7	0	0
Software investments	0	0	0	0
Telecommunication infrastructure	22	16	2	0
ICT investments in manufacturing industries	0	0	0	0
ICT investments in service sector	0	0	0	0
Institutional set-up	0	0	0	0

Figure 20. Analysis of the NITIA’s documents

### Competition, Innovation and Macro-Economic Stability

Piatkowski (2002) focused on the economic and institutional determinants of investments in ICT. He made “New Economy Indicator”, which is aimed at measuring the capability of 27 transition economies to exploit the ICT’s potential and speed up the economic growth in order to catch up with developed countries. On the basis of the original New Economy Indicator for 2000, Slovenia scored the highest, followed by the Czech Republic, Hungary, Slovakia and Poland. Albania, Bosnia and Herzegovina, and Yugoslavia occupied the bottom of the table (Piatkowski, 2002). The ranking showed that the post-socialist countries which were most advanced in the transition process also received the highest scores. Since the level of development of the economic and institutional infrastructure is seen as crucial for innovation and technological change, Piatkowski (2002) argued that the most advanced CEE countries were also the most likely to benefit from the use of ICTs and thus speed up the catching-up process with the EU-15 countries.

The *New Economy Indicator*, as it was mentioned that it had been coined by Piatkowski, suggests that *competition, innovation and macroeconomic stability* altogether provide conducive environment for growth enhancing diffusion of ICT. It provides an insight in how economic policy can contribute to the realization of the growth potential of the “new economy” in both the New and Old Europe (Ark et al., 2004). However, as the authors argued, it should be also stressed that from the perspective of convergence analysis, many CEE countries were able to

increase ICT intensity and raise the ICT contribution to productivity in spite of a much less developed economic, regulatory, and institutional environment than in the EU-15 countries. This might be a feature, as they say, of the first phase of the transition and convergence during which restructuring could take place even without the existence of such an environment. Even though the authors' conclusions give more support to the convergence hypothesis than to the divergence hypothesis, we can argue that the convergence process may slow as productive implementation of ICT in services is more complicated and requires larger changes in the economic environments of CEE countries. Also income and productivity convergence of the CEE countries with the EU will depend on continued progress in “the creation of modern institutions, implementation of market-oriented policy reforms aimed at strengthening competition, *increased innovation*, improvements in the quality of the human capital and an enhancement of the comprehensiveness and effectiveness of regulations” (Ark et al., 2004). I would argue that except for the CEE region, given the fact that the group of transition countries is much larger than the ones in Central and East Europe, we can apply the same criteria of convergence and the same ‘factors’ of progress to the SEE and other countries in the same situation that CEE countries have been from four years ago. These ‘factors’ of progress are graphically presented in the figure below (Figure 21).

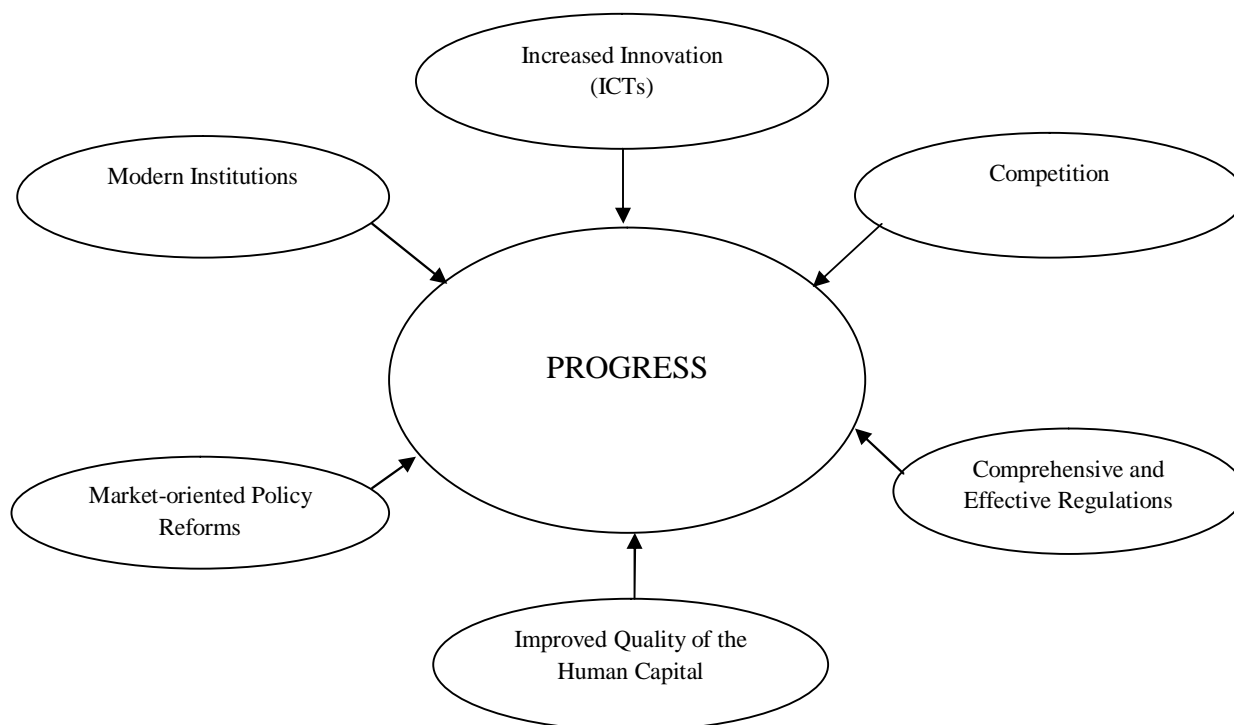


Figure 21. ‘Factors of progress’ in the transition countries (Ark, Piatkowski, 2004)

I also want to emphasize here that according to some of the authors that I have already referred to, the *level of ICT employment* in one country can tell in a significant way about the *level of development* of that country. Therefore, the data about what is the awareness of the Serbian Government and other institutions about the ICT investments, to what extent ICTs are being used in Serbia and how much citizens use Internet can tell us as well how much this country has progressed when it comes to the economic, cultural and social progress, but also where the main challenges are if this country wants to move forward. Ark and Piatkowski's study demonstrates that Serbia is not only behind EU countries, but also behind most of the countries from the SEE region. If we look at the region of the Balkans, behind Serbia are only Bosnia and Herzegovina and Albania. This specifically means that ruling elites in these few countries are not fully aware of the global modernization process which is characterized largely by *ICT development and use*. Some of the previously mentioned authors in this section think that ICTs stimulate more efficient, effective and responsive public sector functioning, and that institutional development level in one society can be significant indicator to the potential foreign investors in that country. These authors argue that the fact how much institutions are developed tells us a lot about their efficiency and effectiveness. No matter if discussion is about electronic services on the organizational side of public sector institutions or about the businesses that have to do with citizens and private sector, it is important to know that numerous authors have written that the *electronic* services can contribute significantly to a higher level of public sector's efficiency, service quality, cutting costs, easier access to the information, fighting with bad habits of bureaucracy, and decreasing corruption level. Furthermore, cutting costs by more efficient and cheaper business than usual can provide us with *extra funds* which can be used to invest in infrastructure, human capital and ICT. I will not go further in the explanation about e-Government, but few most important facts about the e-Government importance was needed to be mentioned for the sake of the overall development and benefits to the society.

To conclude this chapter, the Serbian Government and other relevant public institutions which documents have been analyzed in this chapter show much higher awareness of the concepts such as ICT hardware and software, and telecommunication infrastructure in comparing to the awareness of the need to make investments in the aforementioned fields of development. ICT hardware and software investments together with the ICT investments in the manufacturing industries and service sector are not highly positioned on the agenda of the most responsible public institutions in Serbia since each of these concepts has been mentioned only in few documents and only for few times without significant follow-up actions. Based on this, and also taken into account what Piatkowski's research showed about the CEE and the SEE countries, we can say that it is no wonder that Serbia (Yugoslavia) was one of the three countries occupying the bottom of the table when the research results were presented. If not taken seriously and responsibly what Piatkowski and other authors indicated about the economic and institutional infrastructure, as being a crucial for the innovation and technological change, then the Serbian result cannot be much different than what the result shows in his empirical study about the

transition countries. Competition, innovation and macroeconomic stability have been some of the most important principles with which this author came up with, and the increase in ICT intensity and the raise of the ICT contribution to overall productivity of the (transition) country are therefore some of the conditions how to speed up progress in these countries. The creation of the modern institutions and increased innovations are some of the demands to the income and productivity convergence between the transition countries, on the one side, and the most developed EU countries, on the other side. Even before considering doing this for a cause of joining EU, I think that the transition country should employ gradually more ICTs in order to reach economic, cultural and social progress which would be otherwise a bit harder to achieve. To this cause strong political leadership and its awareness of the global modernization processes are needed which will be materialized through the modern institutions and comprehensive regulative framework.

## 6. Conclusion

Based on what has been stated so far, there are few important results and conclusions to be made at the end of this study. First of all, I will say few things about why this study was conducted in the first place and according to which research questions it was conducted. Second, I will refer to the methodology and theories I used in this research. Finally, I will tell more about the empirical results of the study.

As for the reason why I thought this study was needed in the first place, I argued that the consequences of the discontinuity of the modernization waves in Serbia that have happened so far have had the important effects on the ICT development and Internet diffusion in Serbia today. The new technology, and even broader, the new way of living or new pattern of how to conduct the everyday life is something that is not that easy to implement. The technological gap that exists between Western countries, on the one hand, and transition countries, on the other hand, tends to be bigger and with dangerous consequences for the latter. In order to find the factors of how to interrupt the pattern that Serbian society has had so far when it comes to innovation diffusion, or implementation of anything that is *new*, I have introduced one central and seven research sub-questions. The central research question is: What are the reasons that Serbia lags behind in terms of Internet diffusion and ICT infrastructure compared to almost all other European countries and what can and should the Serbian Government do to address this issue? Subsequently I introduced three research sub-questions according to which I have written the theoretical part and the methodology chapter. Finally the four research sub-questions were introduced as well according to which I looked for the answers to the questions why Serbia lags in terms of ICT development, Internet diffusion, and the level of development of its national ICT infrastructure behind almost all European countries, and finally how do all this compare to other transition countries. Before giving an answers to these questions, it is important to mention that theories I used, such as the Information Society, Knowledge Society, Network Society; Innovation, Technology and Internet diffusion theories followed main trends in modern literature, which basically means in this case that I wanted to find a spot or nod(e) where most of the theories intersect with each other and, based on this implicit agreement, conduct a research on what is the current situation in country such as Serbia today when it comes to the Internet diffusion. As the research methodology, I used in-depth case study approach, with both manifest and latent document (content) analysis.

The answer to the first empirical question which considered the ICT development showed that the Serbian Government and other relevant national institutions have higher awareness of rather general terms such as ‘information society’, ‘technology’ or ‘ICT’. On the other hand, the concepts that were mentioned the least are ‘knowledge society’, ‘networked society’, ‘knowledge diffusion’, ‘digital literacy’, ‘competition in education/ICT market’. This and non-

existence of any follow-up actions to the concepts that were mentioned perhaps once or twice per document can tell us in a significant way about the manner in which these and other concepts were treated further.

As to the answer to the second empirical question which considered the way in which individual Internet users in Serbia are addressed, it was obvious that the concepts not mentioned at all or mentioned only once without any follow-up action are also the concepts that, according to the other sources (such as CePIT's research and international rankings) as well, this country has the biggest problems with, in a sense of not dealing with them in a proper way or not understanding them at all. These concepts are: user characteristics, needs, perceptions, beliefs, attitudes, and intentions; adopter's ability to adopt, knowledge barriers and institutions for lowering the knowledge barriers; cultural factors, cultural knowledge, community of adopters, digital inclusion, digital divide, income per capita, and ICT adoption.

The third research sub-question that was related to the national ICT infrastructure showed us that in between the groups of Serbian Government's documents, on the one hand, and all other institutions' documents, on the other hand, we could find similarity in addressing certain concepts in a same manner which had significant consequences afterwards. Referring to the quite general terms such as 'technology', 'telecommunication infrastructure', 'economic factors' and others, and in the same time not going in details is pretty much characteristic of most of the documents I have analyzed. Not wanting to indicate, understand and/or implement the constituents of the Information Society is the fundamental challenge that I have encountered while analyzing the documents of the Serbian institutions. The terms such as: ICT market, competition in ICT market, access for all (principle), digital divide, bandwidth, and bandwidth availability are the most important conditions of implementing the Information Society and drive of the higher level of Internet diffusion in a society, and yet they are not considered seriously and implemented consequently by the relevant institutions in Serbia.

Finally, as for the fourth empirical sub-question related to the comparisons between Serbia and other transition countries, we saw that the Serbian Government shows a bit higher extent of awareness of the concepts such as ICT hardware and software, and telecommunication infrastructure in comparing to the awareness of the *crucial need* to make certain actions and prepare conditions for the investments in the aforementioned fields of development. Because of this there was no wonder in realizing that Piatkowski's research about Internet diffusion showed that Serbia (he referred to Yugoslavia in his research) was one of the three countries occupying the bottom of the table. Here it is important to mention once again that if not taken seriously and responsibly what the authors indicated about the economic and institutional infrastructure as being a crucial for the innovation and technological change, and actually *doing* something and not only making mere references to these concepts, then the Serbian result cannot be much different than what the result shows in the empirical study about the transition countries.



Strong innovation and internet diffusion; competition in both education and ICT market, digital literacy, and digital inclusion (access for all), as well as knowledge diffusion before or – even better – *together* with the internet diffusion itself have been the most important principles which all the cited authors in this thesis vouch for. The increase in ICT intensity and the raise of the ICT contribution to overall productivity of the (transition) country are therefore some of the conditions how to speed up progress in these countries. Even before considering doing something for a cause of joining an international club or organization, I think that the transition country should employ gradually more ICTs and increase the level of Internet diffusion firstly in order to reach economic, cultural and social progress which would be otherwise a bit harder to achieve in modern era. To this cause, to repeat this again, strong political leadership and its awareness of the global modernization processes are needed which will be materialized through the modern institutions and comprehensive regulative framework, just to mention some of the most important factors of the progress.

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