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Geography of Cyberspace: from the beginning to the future of the discipline.

Geografie Kyberprostoru: od počátku k budoucnosti disciplíny.

Diplomová práce

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Vedoucí diplomové práce: RNDr. Jana Spilková, Ph.D.

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Abstract

This thesis focuses on the topic of Cyberspace and its role within social geography. Cyberspace, the Internet and their influences on everyday life, on many social, economical, political, as well as geographical aspects are obvious. The aim of the work is to uncover and explain the discipline “Geography of Cyberspace“, to form a solid basis and spring board for further studies of this discipline and its sub-disciplines. The work is mainly focused on evaluation of basic literature within the discipline and on introduction of the most important researchers and institutions which are concerned with the research of these issues. The retrieval method was used for purposes of the evaluation. For a complete overview and better understanding of the discipline the thesis depicts the technological history of Cyberspace. It is trying to answer the questions whether and how much Cyberspace influences the “real world“, or whether Cyberspace means the end of classical geographical understanding of the world. A qualitative research was realised for the purpose of the thesis for better comprehension of human perception of Cyberspace. The research was done with the sample of university students who were the foreign exchange students at the time of research. The chosen qualitative method was “focus group“. Cyberspace is a phenomenon which became complex, but still rather invisible part of the society. Social geography and especially its particular researches should focus on this phenomenon in a larger extent.

Keywords: Cyberspace – Geography of Cyberspace – Internet – real world – mapping Cyberspace – identity

Diplomová práce se zabývá tématem kyberprostoru a jeho postavením v rámci sociální geografie. Kyberprostor, Internet a jejich vliv na každodenní život, na řadu sociálních, ekonomických, politických a tudíž i geografických aspektů jsou nepřehlédnutelné. Cílem diplomové práce je odkrýt a vysvětlit disciplínu “geografie kyberprostoru“, být dobrou základnou a odrazovým můstkem pro další studium této disciplíny i jejich subdisciplín. Práce se zaměřuje především na hodnocení základní literatury disciplíny a představení nejdůležitějších vědců i institucí, zabývajících se výzkumem této problematiky. Pro účely hodnocení základní literatury byla použita metoda rešerše. Pro celkový přehled a lepší pochopení disciplíny se práce zabývá technologickou historií vzniku kyberprostoru. Práce se snaží zodpovědět otázky, zda a v jaké míře kyberprostor ovlivňuje “reálný“ svět, nebo zda kyberprostor znamená konec klasickému geografickému chápání světa. Pro lepší pochopení lidského vnímání kyberprostoru byl proveden kvalitativní výzkum na skupině univerzitních studentů, kteří byli v době výzkumu na zahraničním výměnném studijním pobytu. Vybranou kvalitativní metodou se stala metoda “focus group“. Kyberprostor je fenomén, který se stal nedílnou, ale pořád mnohdy neviditelnou součástí fungování společnosti. Sociální geografie, zejména pří svých dílčích výzkumech, by proto na tento fenomén neměla zapomínat.

Klíčová slova: kyberprostor – geografie kyberprostoru – Internet – reálný svět – mapování kyberprostoru – identita

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1 Introduction

”In Cyberspace, everybody is in the dark.”
(Dodge, Kitchin, 2000)

Current world is shrinking more and more. Researchers and scientists are speaking about globalisation, time-space changes, and quicker flows of information. Cyberspace, the word that was firstly enounced by William Gibson's novel Neuromancer in the 1984, is nowadays used in many modifications and by many fields of research. Does Cyberspace have also important influence on this shrinking? What kind of impacts have it brought to our lives? Cyberspace as such created new dimension where people have started to live their lives. It is also obvious that geography and especially social geography has become interested in this topic as well.

The foundation of cyberspace initially commenced with several networks and then finally Internet, which had created kind of technological playground for further origination of Web, virtual life, 24/7 online connectivity (Kreitzman, 1999) and hundreds of other expressions connected to Cyberspace. The Internet is a global network of interconnected computers and was the outcome of a specific set of political-economic relations. The Internet has its historical geography that centres it in the United States. The early beginning of Internet development was in form of the military-industrial complex (Abbate, 1999). In 1969 US Defense Department started to use so called ARPANET, computer network that was a primary component of the super-network which would eventually become the Internet. Historically, J.C.R. Licklider of MIT had previously wrote in 1962 a number of memos about his idea of a 'Galactic Network' linking computers worldwide. These ideas could be regarded as the original documented ideas about the Internet. Next years brought creation of Transmission Control Protocol (TCP) and Internet Protocol (IP), also World Wide Web that is user-friendly interface of the Internet (Gauntlett, 2004, p. 5). Although these steps sound too technological and insignificant for definition of Cyberspace, without them there would be no Cyberspace at all.

How do people behave in Cyberspace? Do they change their identities and live other lives there? Do they really perceive Internet as another space to live or not yet? How can we map this new dimension of human beings lives? What are the serious online threats nowadays? These and many other questions have been asked in discipline that is named Geography of Cyberspace. There are several different names of this field. Besides Geography of Cyberspace there are used also terms Cybergeography or Virtual geography which mean basically the same. For the aim of this work I decided to use the first term, “Geography of Cyberspace”, as from my point of view this is the best term, which covers this discipline as whole.

Although Internet, WWW, Cyberspace became everyday practical tool for the people worldwide and there are plenty of social or urban geographers from all around the world who focus themselves on this topic: there is still not a proper definition of Geography of Cyberspace.

Furthermore, there are many new topics opening every year under this discipline and it is very difficult to absorb them all. This is the typical issue of any other postmodern social-geographical disciplines. From my point of view, it would be even wrong to try to create one unique definition because Cyberspace is too dynamic, multiform and usually surveyed from different angles. This nonuniformity in opinions and definitions should be taken as kind of advantage because each definition uncovers some parts of Cyberspace.

1.1 The aims of the thesis

When looking back at the motives as to why I chose topic Geography of Cyberspace as the topic of my thesis, I can say there are more reasons that persuaded me. Firstly, it was a big challenge to write about this discipline as being one of the very little geographers in Czechia and create kind of a base for further research in this area. During my studies I was always more interested in postmodern, alternative approaches of social geography which led me to study disciplines as behavioural geography, cultural geography where I met with the topic of Cyberspace. Another reason for writing this thesis about virtual world around us is also because of my rich experience in several online projects in Czechia where I learnt more about how the online world is being created, what kind of different users with different behaviours and needs one can meet online, how online life influences the real offline lives of human beings etc.

All the incentives written above have motivated me to create a work that is trying to describe, explain and focus on Geography of Cyberspace. The main aim of the work is to bring overview about the most important researchers in this field and works that were written as basic works of this discipline. In my work, I am trying to define the discipline using different sources and find the theoretical framework, mainly within the social geography. The main part of work also contains an overview about past, present and possible future of the Geography of Cyberspace. I am trying to cover and describe the main changes in the discipline during the time. Besides this, other sub-disciplines of Geography of Cyberspace, which are the points of interest of many researchers worldwide, are mentioned and introduced. Last but not least, also a qualitative research is employed within this thesis. Since I had the chance to write my thesis abroad, I used opportunity to make qualitative research on online lives and behaviour of exchange students from all around the world. This research, based on focus group methodology, helped me to understand and answer my research questions that had been created in my head during the writing of this work.

As I already mentioned above, this work is kind of springboard for possible further research of Geography of Cyberspace among Czech geographers. Because I consider the discipline highly interesting, important and useful as well it would be pity if Czech geography was missing in this area.

The content of my thesis consists from four main chapters and summary. First introductory part explains basic definitions and issues of the discipline, as well as main aims of the thesis. The next three parts of thesis create the key part of the thesis. The importance of the part describing used methodology is in proper explanation why I chose given methodologies and how I used them for the aims of the work. An accurate explanation is even more important in this case as there have been used two different kinds of methods. One method is used for the retrieval part and the other for the qualitative research part of thesis.

The third part of the thesis, which contains the bulk of this paper, describes the most important issues from Geography of Cyberspace till nowadays. The start of the thesis is dedicated to the definition of discipline. Subsequent parts are introducing most important historical milestones of Cyberspace, as well as current and future thoughts. The theoretical framework is supplemented with thoughts over the impacts of Cyberspace on basic geographical characteristics, such as space, place, time and distance. To fulfil the goals of this chapter, I decided to write a retrieval work describing a selection of the most important works within this discipline. Besides this, my attention is paid to the authors of the books – important researchers in this field, and institution working with these issues. I am also trying to find visible touch points of this discipline among the Czech social geographers. At the end, there is a brief discussion about other sub-disciplines and topics connected to Geography of Cyberspace.

Last part before obligatory summary and conclusion is dedicated to the research of the thesis. It is based on qualitative research on exchange students who were asked on their online behaviour, needs, and perceptions of Cyberspace. Qualitative research was led in form of focus groups as it is more described in chapters 2.1.1 and 2.2.2. The main aim of this qualitative research was to find spatial regularities in online behaviour of exchange students from different parts of the world.

To fulfil the aims of the thesis was not always easy as my attention was disrupted by plenty of interesting topics connected to the Cyberspace, especially different surveys talking about particular problems of Cyberspace. Another problem is the high changeability of Cyberspace which caused that some statements and information I read became invalid. When discussing about Cyberspace I would compare it to a very lively organism that is evolving without any great logic or regularity. The observers who are trying to understand this organism, which include myself, have to basically rely on themselves and try to create their own opinion and draw their own definition. This definition can be based on information previously written or quoted before. This was also my case. During writing this thesis I realised that there is not just a singular idea about Cyberspace which could be generally used by everyone.

1.2 Sources and literature

Whilst writing my thesis I found out about the importance of good accessibility to sources and literature and that this “obvious” or “effortless” part of thesis can cause difficulties as well. For this reason and because Internet, Cyberspace helped me a lot with reaching my aim and getting to books, I decided to dedicate one part of thesis to the topic of sources and literature gathering.

The most important sources for my thesis are books that are directly connected to the topic of Cyberspace. The final selection of books was made after consultations with my home university tutor, tutor from University of Ljubljana and online consultation with Martin Dodge, Ph.D. who is nowadays one of the most important researchers on Cyberspace. As I realised afterwards, the majority of the selected books was not unfortunately possible to get from my home university libraries or from libraries of University of Ljubljana. The biggest obstacle was to gather all “the books under the roof”.

As previously mentioned, one of the main aims of describing this situation is to show the importance of Cyberspace and its cohesion within the academic institutions, within the real world and life. Maybe there are not many of us who think about how much our real world is connected with the cyber one. The short story below may let us think a little bit more about it.

The first step I had to do along the way to gather the right sources for my thesis was to arrange consultations with my tutors and doc. Dodge. Personal consultations with my tutors were arranged via email conversations between ourselves. Consultation with doc. Dodge was lead purely online by several exchanged emails with my questions and his solutions. After I received the final list of selected books into my hands (more precisely, in form of document in my laptop), I started to search for the books using online databases of different libraries of my home university and University of Ljubljana. Unfortunately I realised that there are only a very little of the books that are accessible via “classical” way of visiting library. This situation forced me to think about another ways how to get to the books. One option that was offered to me by a friend of mine, who is studying at the University of Salford in Manchester, was to use his access to i-Library account where I was able to read several books online in form of e-books. My mission was not still completed as I was still missing several books. That is why I finally decided to order these books via one of today most popular and biggest bookstore, online service Amazon.co.uk. Chosen books were paid online and shifted after online order to my “real” mail box. To close this story, it is important to mention that all these activities was possible to manage from one place that could have been on the other side of the world than the universities, libraries or bookstores are really located.

Other additional sources for my thesis were articles from different respected magazines. In this case I also chose “online” way to retrieve them. Primarily, I used the online databases of libraries which give access to many academic magazines from all over the world. The process of getting the articles was simple. After advanced search and choose of the right article I simply

downloaded it into my computer. The second important source for articles was online service Google Scholar that offers possibility to search among pure academic texts, articles, books. Even the opinions about this online service differ and there are still doubts if this online service fully respects the copyright of searched sources, in my eyes this kind of service is very helpful and underlines the real essential purpose of the Internet. Furthermore, Google Scholar is in my eyes a typical example of future online services that will offer the users simple and easy way how to get what they search for.

To conclude, it is necessary to underline that although I had basically the will to get to the final sources using traditional way of visiting a library and physically picking up the books, it was Cyberspace which was the final the tool that helped me the most.

2 Methodology

My thesis is based on two different methodologies. The method of information as well as document retrieval and qualitative research methods are used.

2.1 Information and document retrieval

Main part of the thesis is trying to cover the most important points of Geography of Cyberspace. It contents information about the most important researchers and works that have been written about the topic. In this part I am trying to outline the past and present of this social-geographical discipline. For this I decided to use the method of information and document retrieval because I have considered it the best option. Retrieval as such can be divided into several types as document, information, text or data retrieval. Each of them has its own body of literature, theory, praxis, and technologies.

Information retrieval is defined as science of searching for documents, for information within documents and for metadata about documents, as well as that of searching relational databases and the World Wide Web [Wikipedia, Information retrieval]. Besides this, document retrieval is defined as the matching of some stated user query against a set of free-text records. These records could be any type of mainly unstructured text, such as newspaper articles or paragraphs in a manual. User queries can range from multi-sentence full descriptions of an information need to a few words [Wikipedia, Document retrieval].

The definition of given types of retrieval is not as important as form of processing the retrieval as such. Several steps should be followed to consider the retrieval as successful.

The very first step is to clearly define what the aim and basic objects of given retrieval are. In my case the main purpose of the retrieval is to cover the most important books that have given the base to Geography of Cyberspace. As well as to catch the most important ideas, thoughts and interconnections between these works to show the complexity of this discipline, its past, present and possible future.

The next step of a successful retrieval is a collection of information. This means collecting all possible and relevant information in form of books, articles, dictionaries, quotes etc. Because amount of collected information is usually bigger than capacity of the reader as well as his retrieval work, there is an urgent need to specify the boarders and limitations used for minimalising the amount of used information sources. Limits I chose for myself after collecting a great amount of sources present a strict choice of not more than 10 books that were advised to me as the basic works of Geography of Cyberspace whereas the advice was given by one of the most important researchers within the discipline. The choice of the books should be taken as highly relevant. The list of the books is shown in the table below. as a simple overview. Detail retrieval can be found in the 3.6.1.

Table 2.1 The list of books used for retrieval by identified importance for Geography of Cyberspace (importance identified by the author – for more details see chapter 3.6.1)

	Author	**Title**	**Publication**
1.	Dodge, M.; Kitchin,R.	Mapping Cyberspace	2000
2.	Mitchell, W.J.	City of Bits: Space, Place, and the Infobahn	1995
3.	Zook, M.A.	The Geography of the Internet Industry	2005
4.	Graham, S.; Marvin, S.	Telecommunications and the City: Electronic Spaces, Urban Places	1996
5.	Castells, Manuel	The Rise of the Network Society	1996
6.	Miller, D.; Slater, D.	The Internet: An Ethnographic Approach	2000
7.	Benedikt, Michael	Cyberspace: First Steps	1992
8.	Salus, Peter	Casting the Net: From Arpanet to Internet and beyond...	1995
9.	Abbate, Janet	Inventing Internet	1999
Complementary literature that was also studied for the aims of thesis			
10.	Dodge, M.; Kitchin,R.	Atlas of Cyberspace	2001
11.	Graham, S.; Marvin, S.	Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition	2001
12.	Castells, Manuel	The Internet Galaxy: The Internet Galaxy: Reflections on the Internet, Business and Society	2001

Because the basic steps of Geography of Cyberspace were taken in English speaking countries, especially in the USA and the United Kingdom, there was no need to specify the language of the sources. My attention is paid also to the authors of the books whose names repeat in several cases. The retrieval part marginally contents also several statements and quotations taken from scientific articles, but this are only for briefly description of other sub-disciplines of Geography of Cyberspace.

The next steps that follow the preparation part of retrieval were introduction with the sources and the work with them as such. Before I started to go through the books I defined the process of analysing and reading them which was applied on all of them. The process contents these steps:

1. Analysis of the content of the book
2. Choice of the most important and relevant chapters
3. Detail reading of chosen chapters accompanied by noting the most important statements, thoughts, quotations etc.
4. Summary of the most important thoughts of the book and description why and how is the book important for the Geography of Cyberspace

After these steps, the retrievals of chosen books were written. Each retrieval of the book is an independent chapter that is basically focused on the content of the book. The final retrievals consist from several points, such as introduction of the book; pointing out the most important findings of the book; bindings and connections with Geography of Cyberspace; brief description of the content and most important chapters; as well as comments about to whom the book is dedicated.

Writing the retrievals became an interesting work with lot of findings for me. First of all, it taught me how to read broad publications and extract from them the most important for my own needs. I also realised how different can be language of academicians, even they are writing about the same topic.

2.2 Qualitative research

The last part of this thesis is focused on qualitative research on exchange students who came to study to University in Ljubljana for the period of one or two terms. For the aim of this thesis I decided to use qualitative method called focus group. Before definition of the main research questions and hypotheses that I put down before leading the focus groups there should be clear definition and explanation of this qualitative method as such.

After studying several literature sources and books dealing with issue of qualitative research I found out that it is not possible to provide the definition of this methodology precisely. This reflects the fact that the term is naming a category that consists from a wide range of approaches and methods found within different research disciplines (Richie, Lewis, 2003).

There are of course many other definitions of qualitative research. In particular, the authors agree together that qualitative research is a naturalistic, interpretative approach. This research method is trying to understand the meanings which people give and see within different phenomena, such as actions, decisions, values etc., within their everyday lives in society (Richie, Lewis, 2003).

The most useful definition that, in my opinion, covers whole field of qualitative research is the one used in the second edition of Handbook of Qualitative Research by Denzin and Lincoln (Denzin, Lincoln in Richie, Lewis, 2003):

Qualitative research is situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that makes the world visible. These practices … turn the world into a series of representations including fieldnotes, interviews, conversations, photographs, recordings and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative research study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them. (2000: p. 3)

The definition of qualitative research is now clearer but why should we use this kind of methodology for research in social sciences? Because the world we try to understand is more and more pluralised. “Key expressions for this pluralisation are the “new obscurity“, the growing individualism of ways of living and biographical patterns, and the dissolution of “old“ social inequalities into the new diversity of milieus, subcultures, lifestyles, and ways of living. This pluralisation requires a new sensitivity to the empirical study of issues” (Flick, 2006, p. 11-12).

What are the key features and functions of qualitative research? As Uwe Flick summed up in his introduction book to qualitative research, the essential features of qualitative research are the correct methods and theories; the recognition and analysis of different perspectives; the researchers' reflection on their research as part of the process of knowledge production; and the variety of approaches and methods that can be used (Flick, 2006).

Qualitative research as such provides the way how to better understand and know different social issues. To consider the position of its methods it is useful to understand some of the broader functions of social investigation. These have been defined in various ways, depending on the purpose of the classification. In general it is possible to identify this simple classification of social research functions (Richie, Lewis, 2003, p. 37):

- *contextual function* – describing the form of nature of what exists
- *explanatory function* – examining the reasons for, or associations between, what exists
- *evaluative function* – appraising the effectiveness of what exists
- *generative function* – aiding the development of theories, strategies or actions

There were basically explained the characteristics of qualitative research, as well as its basic functions and research aims. Because thesis uses focus group method as qualitative method of its research, there is provided closer introduction and explanation about this particular method.

2.2.1 Focus group as a highly efficient method of qualitative research

There are different ways in which data can be generated. One of the ways in qualitative research is the use of ”focus group“ that can be named as well as ”group discussion“. The terminology of this research method has changed in meantime. Earlier term used was ”group interview“ or, in the United Kingdom ”group discussion“ (Richie, Lewis, 2003, p. 170).

Focus group consists usually from four to ten respondents who are put together to discuss and answer the research questions of the researcher as a group. The focus group is mainly used in situations where group attributes and characteristics can help to illuminate the research issue. Data and outputs are naturally generated by members of the group in form of different

interactions. Respondents present their own views and experiences, but they also listen to the answers and opinions from other people. This usually causes reflections on what is said so that the respondents possibly modify their further standpoints. This is considered as one of the biggest strengths of focus group discussions. They are also ideal for creative thinking.

Another feature of focus group is the possible spontaneity that can come from the stronger social coherence. For this, respondents easily uncover more of their opinions about the subject of study. In comparison with in-depth interviews that are lead on individual level, focus groups are considered as more naturalistic and so as more effective research setting (Richie, Lewis, 2003).

Also Patton (in Flick, 2006) sees the focus group interview as ideal qualitative data-collection technique, which provides some quality controls on data collection: "Participants tent to provide checks and balances on each other which weeds out false or extreme views. The extent to which there is a relatively consistent, shared view can be quickly assessed." (Flick, 2006, p. 190)

It is also important to realise that focus group interview is just an interview. "It is not a problem-solving session. It is not a decision-making group. It is not primarily a discussion, although direct interactions among participants often occur" (Patton in Flick, 2006, p. 190). Anyway this kind of "disadvantage" becomes an advantage in this thesis, because I tried to collect opinions and descriptions of personal behaviours of online users.

Several weaknesses of this qualitative method can be also expressed such as e.g. limited number of questions that can be addressed, or unpredictable twists and turns that can occur because of impossibility to ensure the same conditions and variety of members for all planned sessions.

2.2.2 Analysis of qualitative data

One stage in the research is its preparation, research realisation as such and collection of data. The other stage that comes afterwards is an adequate analysis of qualitative data which is in comparison with quantitative analysis not so straightforward and without exact rules or procedures for analysing. Despite of this, there can be defined the ways how to analyse qualitative data. For the aims of this thesis, especially for the character of gathered data, I chose two main ways of their analysis (Richie, Lewis, 2003, p. 200):

- *narrative analysis* – identifies the basic story which is being told, focusing on the way an account or narrative is constructed, the intention of the teller and the nature of the audience as well as the meaning of the story
- *content analysis* – in which both the content and context of documents are analysed, themes are identified with the researcher focusing on the way the theme is treated or presented and the frequency of its occurrence. The analysis is then linked to outside variables such as the gender and role of the contributor.

Besides these ways, there can be identified three different contexts of interpretation in qualitative analysis: *self-understanding*, where the researcher attempts to formulate in condensed form what the participants themselves mean and understand; *critical common sense understanding,* where the researcher uses general knowledge about the context of statements to place them in a wider area; and *theoretical understanding,* where the interpretation is placed in broader theoretical perspective (Richie, Lewis, 2003, p. 201).

If we look directly on analysis of focus group data there are usually used only two types of work with these data, the first of which is most commonly practised (Richie, Lewis, 2003, p. 258):

- *whole group analysis* – which treats the data produced by a group as a whole without delineating individual contributions. The group therefore becomes the unit of analysis and will be treated in the same way as a unit of individual data. Additional information about group interactions or the balance of individual contributions may be added to the data as part of the evidence.
- *participant based group analysis* – where the contributions of individual participants are separately analysed within the context of the discussion as a whole. This allows the information of each participant to be retained and for interactions between individual members to be noted as part of the recordings of the group dynamic.

In my thesis I am trying to use *self-understanding* way of analysis added by *critical common sense understanding*. Because it is more important for me to understand differences and similarities occurring in group and define from them general regularities and obvious parallels I am analysing the focus group data on *whole group base*.

I am also trying to focus on the biggest differences that can be recognised between individual interview method and focus group method. The main possible differences that were already mentioned above are e.g. unpredictable group dynamics (this can appear any time during the group and this can have influence on the way in which the subject is discussed); interactions among members (the interactions that usually appear during the session can have the form of disagreements, conflicts); uneven and less extensive coverage (it is not possible to get the same level of data and information from each group member, the depth of information is also lower than an individual interview); influence from the others (group members have the opportunity to hear different or opposing views that can change their own answers) (Richie, Lewis, 2003).

3 Geography of Cyberspace

Although it still sounds like an unknown field of research, Geography of Cyberspace with its sub-disciplines composes great colossus of interconnected topics and issues. The main wave came from the universities in the USA where several successful projects with similar aim – origination of the network – were created. The first "jumps" over the Atlantic Ocean lead to the United Kingdom and its domestic universities that had connected with those in the USA. Besides these first steps, there were several experiments in other European countries, such as France or Germany, and also in Asian countries (e.g. in Japan). First highly technological aims, usually supported by state interests, crossed slowly the boarders of commercialisation. Simply said, the global Internet has grown by stages. It began as a domestic American network. Then it reached the second stage – no longer U.S.-only but still U.S.-centric network. Now we can talk about the third stage – a globally distributed, post-U.S.-centric Internet (Abramson, 1999, p. 148). More details about the history and invention of Internet can be found further within this part.

Internet or network or Cyberspace, whatever we name it, became an everyday tool or "partner" of our lives. Its place in academic researches is stable and respected. During studying this issue and reading different sources about Cyberspace I realised that mainly sociology and psychology have the great interest in this topic. Sociology is focused on topics such as cyber-subcultures, communities, changes of identity etc., while psychology focuses mainly on differences in behaviour in real and online world, impacts on psyche of Internet users, different kinds of online threats etc. These close interconnections of the research fields and often overlaying topics caused me difficulties to detect in geographical approaches within the read books or articles. Especially, the sociological approaches are in this case very close to the geographical ones.

This part of thesis is the backbone of the thesis. Besides the effort to define the topic as precisely as possible there is a discussion over the most important books and researchers connected to Geography of Cyberspace, naming the current hot spots in this field as well as trying to predict the possible future of this discipline.

3.1 Definition of Geography of Cyberspace

The definition of Geography of Cyberspace basically comes out from the term Cyberspace. Cyberspace is another space that geography studies. Cyberspace is the object of study of geography. To better understand the meaning of Geography of Cyberspace it is necessary to understand the meaning of Cyberspace as such.

What does prefix "cyber" actually indicate? Why did William Gibson decide to use this prefix to create the word Cyberspace? Cyber comes from the Greek "kyber" which means „to steer" or "to govern". Kubernetes, with Greek root as well, means "steerman". When the word is transformed into cybernetics it refers to the science of self-steering (Burnett, Marshall, 2003, p. 25). The

explanation of Cyberspace that is also connected to Greek roots says that the term Cyberspace literally means “navigable space” and is derived from the Greek word kyber – to navigate (Dodge, Kitchin, 2000, p. 1).

While searching in human geography dictionaries I came across a complex definition of Cyberspace (Johnston, Gregory, Pratt, Watts, 2000, p. 147):

Alternative worlds generated by computers. The term „cyberspace“ was first used quite casually by the science fiction writer, William Gibson, in his 1984 novel, Neuromancer. In the book, cyberspace was a there that was not there, an alternative world conjured up by a computer in which people could cruise like disembodied spirits among virtual computer-generated landscapes, „all the data in the world stacked up like one big neon city, so that you could cruise around and have a kind of grip on it, visually anyway, cause if you didn't, it was too complicated, trying to find your way to a particular piece of data you needed (Gibson, 1988, p. 13). The term rapidly became part of common usage, reflecting more of a cultural longing for such a world than its actual existence (Benedikt, 1992; Bukatama, 1993a, 1993b; Crang and May, 1999). Taken up by an odd alliance of the computer industry, artists, and cultural studies academics, the term has spawned a large number of books and papers which are as likely to be general disquisitions on western society as they are careful empirical studies.

The name of William Gibson is repeated in many sources and it seems that his book, Neuromancer, was the basic stone of Cyberspace. I cannot agree with this assumption because Cyberspace, although it was not named like this before Neuromancer publication, was already alive and in use for more than 40 years. It can be said that a kind of Cyberspaces or virtual spaces existed in the world for hundreds years as kind of “inner” worlds of people, their inner thoughts and perceptions of the outer “real” world (Kučera, 2006). From my point of view and what I believe is that the real origination of Cyberspace is definitely connected with technological development of computers and first experimental projects that were delivering first network connectivity. If the complex matrix of networks we have today began anywhere, it began at Dartmouth College in September 1940. More details about this project can be found in following chapter.

The spectrum of Cyberspace definitions is wider. It is interesting to see the differences in these definitions by the field of the researcher who wrote it. One of it says that Cyberspace is what Foucault has termed a “technology of the self”, a device which effects the social construction of identity by altering the conditions under which it is constructed (Aycock in Dodge, Kitchin, 2000, p. 53). In other words also connected to social construction, Cyberspace is a place where “the self is constructed and the rules of social interaction are built, not received” (Turkle in Dodge, Kitchin, 2000, p. 53). More psychological and mental explanation comes from Benedikt (Benedikt, 1992, p. 119) who says that Cyberspace is a “common mental geography”, a medium in which “ancient spaces” (mythical or imaginable spaces) become visible. Spanish sociologist Manuel Castells (Castells, 2006) refers to Cyberspace as a space of flows characterised by timeless time and

placeless space; a space where the formal qualities of time and space are qualitatively different. Castells argues that temporality is erased, suspended and transcended within Cyberspace.

As can be seen there is still a contradiction in the definitions of Cyberspace. While some of the researchers count Cyberspace still for kind of space with its characteristics, the other researchers argues that Cyberspace caused death to classical perceiving of space, place and time. Next chapters will show that there is a huge discussion whereas Cyberspace destroys the meaning of basic geographical characteristics such as space, place, time, distance etc. Next chapters basically show where the “abrasive surfaces” between geography and Cyberspace are.

3.2 Brief history of the Cyberspace, Internet, WWW

For better understanding of technological background of Cyberspace it is good to mention several most important steps in the history of “the Matrix”. There are two books that should be read if one wants to understand the Cyberspace. These provide the best historical overview with many technical details. The books are *Peter H. Salus*' publication “*Casting the Net: From ARPANET to Internet and Beyond...*” written in 1995 and *Janet Abbate*'s publication “*Inventing the Internet written in 1999*”.

Like all technologies, also the Internet is an outcome or creation of its social environment and current needs. The Internet is not a recent phenomenon. It is a product of long decades of development and many turnovers. First of all, it is important to remember that the network was not originated to be a medium for interpersonal communication. It was invented for the scholars to overcome their difficulties of running programs on remote computers. The current commercially run communication-oriented Internet emerged only after a long process of technical, organisational and political restructuring (Abbate, 1999, p. 2).

As previously mentioned, the very first experiment that can be count as the beginning of network history happened in September 1940 at Dartmouth College. It was the meeting of the American Mathematical Society where it was planned to demonstrate the Complex Calculator at that time placed in New York. The final decision was to demonstrate the calculator remotely. The attendees who came to Dartmouth were able to use the calculator even despite it stayed in New York via the telegraph connection. That was the very first connection “on distance” whereas the distance was around 370 km (Salus, 1995).

Time till 1960's was filled with similar projects, all located in the USA and usually on different universities (University of Illinois, University of Michigan or MIT). The non-commercial project ARPANET started in 1968 under the wings of ARPA, at that time Advanced Research Projects Agency, represented a big step forward. Its aim was to create kind of network that would connect different computers located on different places. The first ARPANET node was installed at University of California in Los Angeles (UCLA) and four nodes communicated from different geographical locations in the western United States.

Important technological improvement of this time was origination of packet-switching. Simply said, “packet-switching involves breaking data or messages into units of equal size for posting through the system. Each packet is labelled with an identifier and the address of its intended recipient. The packet is passed from one packet-switch (node on a network) to another until it arrives at its intended destination. Packets can travel using alternative routes and at their destination are reassembled into their proper sequence using individual identifiers” (Dodge, Kitchin, 2000, p. 7).

Within the ARPANET project, there was originated also product that afterwards became one of the most successful and popular commercial products ever – email. Email services had been first used in the mid-1960's. The users who got a chance to use the first email communication were able to leave messages for each other and so exchange information (Cerf in Dodge, Kitchin, 2000). In 1970, it was written the first program that allowed mail to be sent across a distributed network. The program circulated quickly between all ARPANET sites and by 1971 the two most used applications were electronic mail and remote login services (Salus, 1995).

In the 1960's the possibility for communication via computer was still unthinkable. The computers were unstorable and too expensive. Looking at the wider picture of investments into computing technologies it can be said that in the 1960's they became policy instruments both in the United States and in the United Kingdom. For instance, in the United Kingdom in the focus on the computer industry was seen as a symbol of the Labour Party's commitment to current modernization. This new industry was seen as important engine of economic growth. In the United States, technological prowess was seen as a weapon in the Cold War (Abbate, 1999).

1970's were the era of first network projects out of the United States. Biggest effort could be seen in France, Germany, Japan, United Kingdom and within European Economic Community (EEC, previous form of European Union). French project CYCLADES that took different path from that of the ARPANET was initiated in 1972. The difference was in technical level, usage of different approaches. When focusing on Germany, the earliest networking experiments appeared at the Hahn-Meitner Institute in Berlin in 1974. There was as well the United Kingdom that started with networking in early 1970s. There were already British representatives who worked on ARPANET project which was great basic stone for the national project. This time it was the British post office that did extensive work on a packet switching network. The network called Experimental Packet-Switching Service was opened for use in 1975 but for incompatibilities and other problems it was closed in 1980. The intentions of EEC towards networking started in 1968 when there was created an agreement that “informatics“ is an important international project. Selected group started to work on project “a pilot informatics Network” in 1973. After years of development, stabilization of system and solving the interconnection problems there was finally a public demonstration in 1978. Unfortunately European Informatics Network never went further. Focusing on Japan there were also couple of first networking steps in 1970s. There were several university projects such as TECHNET, the experimental Internet network at Tokyo University, and KUIPNET, the Kyoto

University in-house network, as well as participation of Tohoku University in US project ALOHA (Salus, 1995).

1970's were important also for the first thoughts about commercialisation of network. By 1974 the representatives of ARPANET project had interest to sell this project to commercial firms. The major corporations were sceptical as to whether computer networks could be turned into viable economic entities. Finally, it was another project that crossed as first the boarders of commercial world. It was Telenet's application that started to serve US cities after getting the permission in 1973. In 1985, the Telenet network was locally dial able from nearly 400 US metropolitan areas and 67 countries. Although the beginnings of commercialisation of network were not very easy and profitable this was important step in the era of networking (Salus, 1995). Commercialisation of network and interest of international politics caused the first thoughts about Internet standards in the late 1970's and in 1980's. The Internet and its creators were no longer operating in the isolated world with the only aim – national defense. Origination and recognition of TCP/IP is one of the most visible examples among these standards (Abbate, 1999).

The 1980's meant in computer and network industry a steady growth in institutional networks and so called bulletin board systems, . This time was characteristic for the development of public access Internet architecture and the construction of the first gaming worlds (Dodge, Kitchin, 2000). So called UKnet and EUnet were the connecting points on European side. European projects moved quickly forward during the 1970's and there were many universities and other institutions that became involved into network issue. Namely Mathematical Center in Amsterdam, University of Kent in Canterbury and many other British universities got connected. Expansion of so called EUnet happened in 1982 after the meeting of the European Unix systems User group in Paris where this system was set up. Japan moved on as well in their network projects. JUNET – Japanese Universities and Research Net – began in 1984. In 1988 this network already connected over 2000 computers in 200 organisations via dial-up lines (Salus, 1995). In the early 1980's, two new special purpose networks modelled on ARPANET, were built in the US. CSNet was designed to give access to electronic mail to non-defence contracting computer science departments and was funded by the National Science Foundation (NSF). BITNET was aimed at the wider academic community and was partially funded by IBM (Hart in Dodge, Kitchin, 2000, p. 10). 1983 became a very important year because of another technical switchover that had happened because of rising technical problems. It was the year of switchover to TCP/IP which caused that ARPANET became the Internet (Salus, 1995). The Internet – a system of many interconnected networks that is capable of almost indefinite expansion. For all its later importance, however, the Internet was not part of ARPA's initial networking plans. The Internet became a new type of networking and its development was followed by a series of unforeseen events (Abbate, 1999). Looking a bit on achieved numbers, by 1986 there were 1414 sites, by 1988 there were 11000 sites with four million bytes being posted every day (Dodge, Kitchin, 2000).

By the late 1980's and early 1990's a significant amount of research was underway outside of the United States and the technologies were starting to attract both commercial investment and media attention. In 1990 The World company and its website became first site to offer full commercial Internet dial-up access to the general public. The first Internet applications used for searching were originated. Archie (developed at McGill University in Montreal), Gopher (developed at the University of Minnesota), Veronica (developed at the University of Nevada at Reno) or Jughead (developed at the University of Utah) – these were the first simple pioneers on the way to high developed search tools (Salus, 1995). Applications created during this time tended to be simulators, allowing users to experience a particular environment and learn how to react to a series of situations. This period was also famous for origination of World Wide Web developed by Tim Berners-Lee at CERN in Switzerland, which is a system of interlinked hypertext documents contained on the Internet. Also Mosaic, the most popular user interface to WWW, was created at the University of Illinois and started to integrate graphics, test and sound into “pages” of information (Salus, 1995). In March 1995, WWW became the service with the highest numbers and best results in traffic on the Internet (Dodge, Kitchin, 2000).

Switching to the topic of commercial potential of the Internet there is a simple summary of the most important competitive advantages for business usage that was put under six headings: “electronic email, access to research, tracking competitors, inexpensive remote collaboration, enhanced customer service and low/cost marketing and advertising” (Salus, 1995). “With the growing commercialisation of the Internet there has also been an explosion of service providers and a host of spin-off industries such as those that design and maintain web pages, online consultancies, and cybercafés where you can connect to the Internet whilst having a coffee. The proliferation of these industries is likely to continue, especially as digitally-based industries collide and merge. Indeed, the late 1990's were characterised by massive commercial investment in Cyberspace by investors seeking competitive advantage, particularly with the e-commerce hype and huge stock market valuations surrounding companies like eBay and Amazon.com” (Dodge, Kitchin, 2000, p. 11).

The success of Internet, one of the network projects, basically stood on its flexibility and diversity, both in technical and organisational part. As can be said today, nobody predicted and thought about such a final state of this project. That was the real revolution in the computing and communications industries at the end of the twentieth century (Abbate, 1999).

That is the brief history of network and Internet with its most important milestones. As could be seen the early begins of network were very closed and determined only for few selected institutions, mostly with academic character. Only first commercial steps in 1970's allowed the public to get in. This was the break for development of the real Cyberspace as it is understood nowadays. Network was divided into two basic platforms, the Internet and different kind of intranets that, in my eyes, mostly substituted previous non-commercial projects dedicated for different organisations and institutions. Simply said, the difference between intranets and Internet is

based on accessibility. Intranets can be accessed only by members of given institution (enterprise, organisation etc.) and there can be thousands of them. The Internet is only one and is accessible to anyone who has Internet connection and computer in hands.

Internet is the place where Cyberspace settled down. This is basically the space with the highest number of user interactions where users try to change their identities and escape from the everyday real world. This is basically the space where different cybercultures and cybersubcultures are being originated. This is basically the space that became an interest of many different researchers, social geographers as well.

3.3 Present and predicted future of Cyberspace

Cyberspace in wider meaning should be understood as “anything” that has technologically accessed our lives and started to be a part of our everyday activities even without our consciousness. It is not only Internet and our user browsing “online” that is transferring us into “life” in Cyberspace. Using a mobile phone, navigation system in the car, withdrawing money from cash machine, providing online payments with virtual money, buying the books or electronic devices in e-shops, going on a special surgery lead by the surgeon on far and many other situations in our “real” life are dependent on Cyberspace. Origination of soft cities – cities that are basically functioning on different Cyberspace systems – this is the fact of nowadays. Orwell's 1984 was kind of prediction of Big Brother control that would be checking our steps wherever we move, whatever we do. Although his imaginations were not technically perfect, nowadays situation in Cyberspace that is technologically mature and in permanent development seems as a world of plenty “Little Brothers” that are recording each of our electronic steps (Mitchell, 1995).

Current research deals with great amount of geographical and sociological topics that are directly connected with topics of Cyberspace, Internet, networks. Geography of Cyberspace became into interest of social geographers shortly after origination of network and Internet. Changes in research aims have been shifting in relation with new phenomena appearing within the network as e.g. i-Islam issue, online threats of children or wars lead within the network.

The word “Cyberspace” started to be spelled also in different classical geographical disciplines. This is more discussed in following chapter talking about theoretical framework within the Cyberspace topic. Because Cyberspace was recognised as the new dimension of everyday life and the Internet became an important and strong engine for different geographical and social changes, because it is the network that is challenging classical geographical regularities, it was necessary to name this phenomenon and emphasise its importance.

The future of Geography of Cyberspace or even of Cyberspace as such is difficult to predict. On the first place, it is not easy to choose which part of Cyberspace to predict. There can be predicted quantitative data such as number of Internet users in different countries as well as the level of threats or conflicts that Internet causes. On the other hand, the network is very active organism that is changing itself strongly and quickly and without any basic rules. In the prediction

we can focus on possible technological development or on changes in user behaviour that can have direct impact on Cyberspace. We can only guess how strongly our lives will be dependent on network. Anyway, the expectable fact on the Cyberspace future is that because Cyberspace is a product of society which has been always changing depending upon current social, political or economical needs, this dependence will be conserved henceforward.

Similar future can be predicted also for Geography of Cyberspace. From my point of view which is based on my own “online” experience, history of Cyberspace and development of the discipline, I assume that Geography of Cyberspace will always be strongly dependent on the changes that will be happening on the network as such. New sub-disciplines, theoretical approaches, methodology or practical utilisation will be originating and changing in terms of upcoming happenings or problematic issues of Cyberspace. As it could be seen in different books dealing with Cyberspace (e.g. Salus, 1995; Mitchell, 1995), future predictions in these books partially missed the final reality. I consider that nowadays predictions of Cyberspace future will have the same ending.

It is obvious that Cyberspace and the Internet, one of its strongest parts, is one of the most important tools used for any kind of world transfers such as trade, money, labour force, and that it has significant impact on any kind of human activities. My assumption for this is that it will not be possible to look at the most of geographical or sociological changes without having in mind the present of the network.

3.4 The theoretical framework of Geography of Cyberspace

"An era where a new socio-spatial nexus is being constructed."

(Harvey in Mitchell, 1995)

In this chapter I am trying to show and explain the theoretical framework of Geography of Cyberspace. I found the possible connections of this discipline within the classical theories and approaches of the social geography in the 20th and 21st century. Because Cyberspace and Information and Communication Technologies (ICTs from now on) challenge mainly geographical factors as space, place and time and relations among them, it was obvious to mention those disciplines which focus on these factors. Despite of this, the classification of the discipline of Geography of Cyberspace under just one single social geographical discipline is not possible. Although the connections are very strong with a wide scale of geographical disciplines, as well as within the sociology, psychology etc., Geography of Cyberspace is standing independently as a full-value discipline of social geography.

One of the big changes in social geography and its approaches took place in 1950's and 1960's during so called Quantitative revolution in geography. At that time, this science moved towards "new geography" that was also called "spatial science" (Dostál, 2008/2009). The new paradigm approach was reaction on dissatisfaction of the social geographers with contemporary approaches in social and regional geography. The main movement in the post-war era was from idiographic thinking towards nomothetic thinking. This was based on generalisation and searching for regularities, spatial patterns in the natural and social interactions. Nomothetic researchers wanted to improved geography to the same level as the level of other social and natural sciences. During the same time era the importance of the first networking projects and importance of "being connected" was rising up. As can be seen nowadays, Geography of Cyberspace is trying to find the regularities and important spatial patterns and impacts caused by "network" as well. What more, although it uses qualitative research methods for micro and individualistic studies, methods trying to map Cyberspace in general and global level (e.g. maps of connections, maps of users' activities) have to use quantitative data that is typical sign of nomothetic approach.

1960's brought important reaction on spatial science which was basically built on criticism and failures of new geography. The criticism of the spatial geography was that it was too systematic and focused on localisation theories of neoclassical economical approaches which neglected the processes of behaviour, decision, perception etc. That was the right time for behavioural geography – positivistic discipline that took into account these processes within the space. Although it still respected nomothetic approaches of generalisation when it tried to model and show the spatial patterns of behaviour, decisions and mobility, this discipline was more sensible to individuals and their cognition of space (Spilková, 2008/2009). In some cases, Geography of Cyberspace is considered as a sub-discipline of Behavioural geography but the

relationship between these two research fields is different, they are equal. The typical outputs of behavioural geographic research are mental maps, maps of cognition that are trying to show and proof the differences between the real geographical space, where the individuals move and their mental perception and cognition of this space. But because Cyberspace as such is already kind of mental space it is difficult to proof the same differences in this case. What should we take as “the real Cyberspace“ and what should we count for “an individually recognised Cyberspace“? From my point of view, both research fields stand next to each other. Behavioural geography can study Cyberspace as one of the spaces that are recognised by individuals. Geography of Cyberspace can use the approaches and methods of behavioural geography for its own needs.

A very important role in the post-war geography plays the “time geography”. It firstly appeared in 1950's as a new research field of Swedish geographer Torsten Hägerstrand (Dostál, 2008/2009). This discipline is connected with the name of Lund University where Hägerstrand worked. Time geography is that branch of human science which deals with the study of temporal factor on spatial human activities with constraints like authority (limits of accessibility to certain places or domains placed on individuals by owners or authorities), capability (limitations on the movement of individuals based on their nature, biological factors) and coupling (restraint of an individual, anchoring him or her to a location while interacting with other individuals in order to complete a task). In case of behavioural geography we can speak about time geography as about parent discipline. Time geography started to observe the movements, behaviour and decisions of individuals in connection with different limitations. As it was already mentioned, Geography of Cyberspace challenges basically time-space relations. Especially “time, it is argued, is becoming the crucial dimension of who is accessible, rather than space dimension, e.g. geographical location” (Dodge, Kitchin, 2000, p. 14). Geography of Cyberspace is not sub-discipline of time geography but starts from its assumptions and attacks its essence.

There are other important connections with other social-geographical disciplines. For instance, with cultural geography which focuses on different cultural products in space, their variations and changes in time: languages, religions, economies and other cultural phenomena as well as on processes of regional and identity formation (Havlíček, 2008/2009). Cyberspace as such within cultural geography is considered as strong culture with variety of different subcultures. This research field is abstract enough to apply the process of regional formation also into the cyber space.

Urban geography is another example where Cyberspace pronounces its importance. Many studies comments what kind of impacts and changes Cyberspace caused in urban areas. Already urban sociologists, who became one of important social geographical directions in 1960's, were looking at the city as at an important social laboratory where communication tools (TV, radio, news) were very important determinant of society (Dostál, 2008/2009). Has the development of ICTs and connection in the cities helped them or has it destroyed classical life and functioning of the cities? Many scholars argue that city structure has changed and today it is more composed of and

controlled by computers. It is easy to recognise that current cities consist of thick computer networks and gigabytes of information crossing the city. Computer network is becoming a city as such (Batty in Dodge, Kitchin, 2000). More detail discussion about Cyberspace impacts in urban areas can be found within the discussion over the books.

The background of Geography of Cyberspace can be seen also in connection with geography of information society that studies rising and spreading of networks and activities connected with networking all around the world. This spreading of course causes the impacts and geography of information society is trying to underpin any kind of restructuring appearing in different parts of society (living, economy, industry, consumption etc.). These shifts should be understood as an evolutionary development. It is not a transition into some different condition. As many others inventions, ICTs and Cyberspace are also strongly bound to capitalist modes of production. Simply said, Cyberspace is a commercial product, which has opened new markets of opportunity and has created new industry (Dodge, Kitchin, 2000).

To sum up this brief overview of most important social-geographical approaches and their interconnections with Geography of Cyberspace, Castells' suggestion can be used. He says that the spatial logic is being divided into two distinct forms; a new “space of flows” which is starting to be more important and dominant than the old “space of places” (Castells, 1996). “Geographic space is being supplemented by a virtual space allowing people and organisations to be more flexible in relation to real-space geographies” (Kitchin in Dodge, Kitchin, 2000, p. 15).

Interesting comments on Cyberspace can be found also under geographies of power and exclusion. Firstly, geographies of power see in Cyberspace some contradictions. On one side, Cyberspace can be considered as a space of individual freedom and power. On the other side, Cyberspace is understood in the sense of “Big Brother” future where users will move in a giant panopticon (Dodge, Kitchin, 2000). The statements of geographies of exclusion also show a conflict. Although Cyberspace is often promoted as a space anybody can access, uses and provides her or his individual autonomy, this is not true in fine. Cyberspace is not accessible to all. The second claim, which geographies of exclusion uses is that everyone in Cyberspace is equal. This can be refuted by any study of online community which would reveal that this is not the case. Power relations and inequalities known from real world continue to exist within various Cyberspaces (Dodge, Kitchin, 2000).

More in general and out of the social geographical boundaries there can be found different opinions about Cyberspace and technological dependence via different approaches. For instance, utopian approach says that the technology is a very strong determinant of basic aspects of our lives. For the representatives of utopian approach the technical innovations are important shapers of society and cause significant shifts within it (Dodge, Kitchin, 2000). Social constructivists assume that “technology is a social construct and technology and society cannot be separated because they are intimately entwined with each other and with nature” (Escobar in Dodge, Kitchin, 2000, p. 25). As such, technology is mediated by culture, and vice versa. Political economists basically say that technology and society are bound together and both strongly supply the

political, economic and social relations which underlie capitalism (Graham, Marvin, 1996). “Here it is posited that technologies are rarely neutral, but are developed in the interests of industrial and corporate profits” (Penley, Ross in Dodge, Kitchin, 2000, p. 26).

The interest about Cyberspace within the science is wide and the connections with particular statements of different approaches are obvious. Although my first expectations about Geography of Cyberspace were that it is only a sub-discipline of one social geographical discipline, it should be taken as the real pure discipline of social geography with its own definitions, research methods, outputs and finally practical utilisation.

3.5 Death of place, space, distance and time?

Real geographical space is nowadays more and more challenged with increase of different technologies. The meaning of time, space, and distance has been changing during the centuries with origination of railways, telegraph, phone, cars etc. There is a big discussion whether Cyberspace is causing the death of place, space, distance and time, its basic meaning and understanding. But what can be said about the previous technological inventions? Did not they cause the same already? The aim of this chapter is to discuss over this topic and to find the most objective facts whether ICTs, Internet and Cyberspace cause such destruction or not.

Does geography still matter in this world? And what are the basic characteristics that are purely geographical? The real geographical space is possible to describe with using terms as size, distance, direction, place or time. The geographical space is possible to map whereas there can be found different natural or artificial linesor boarders, exact localizations of the elements. It is easily possible to define the regions and their hierarchy (Mašata, 2003/2004).

What does it mean when we talk about space, place, distance and time within the geography? Space basically can be viewed either as “absolute (Aristotelian, Newtonian) – space is understood and treated as a container filled with objects, or as relational (Leibnizian, Kantian) – space is understood as the consequence of interrelationships between objects” (Dodge, Kitchin, 2000, p. 28). As a social geographer it is explicit to me that definition of space as a relational unit is the right one. Space is not a passive geometry without any external relations and dependencies. It is strongly determined by social interactions, which are continuously changing it. It is important to understand that space is not essential but it is constructed and produced (Dodge, Kitchin, 2000).

Place is another characteristic of geographical space. It is one exact position, dot, node that can be precisely localised. Each place has its physical and human characteristics; each place has its own sense. Behavioural geography would add importance of perception of the place in terms of positive-negative, known-unknown etc. These perceptions are usually created as a result of previous gathered experiences. Once a place or a location is identified, once it is named and recognised, it is separated from the rest undefined space that surrounds it.

The distance between two places in space is another important characteristic of real geographical space. Distance can be easily defined as accessibility between point A and point B

within the given space. Distance can be measured in metric units or time units while there can be found striking differences in results. The final distance of two places is highly dependent on what kind of tool one decides to use for its overcoming. As well as space should be considered as relational and relative unit, also distance and time in geographical space are relative. This relativity in time-space relation was defined already by Torsten Hägerstrand who defined the constraints that are placed in front of individual while passing given space. Because constraints and conditions of movement are always different, the perception of distance and time between two dots is relative.

How these characteristics of space, place, distance and time fit on Cyberspace? Cyberspace causes many troubles and new challenges to the thinkers of space. Cyberspace is a space, which consists from its places – from different web pages, chat rooms, bulletin boards, virtual reality environments, information databases, all with "their own sense of place and space, their own geography" (Batty in Dodge, Kitchin, 2000, p. 30). Cyberspace consists of many spaces but they are all constructions. Cyberspace is a product and its "architects" are basically the designers, and in many cases, users. Cyberspace spaces can have the formal qualities of "geographic" space if it was programmed so. On the other side, the forms and designs that can be found within Cyberspace are dematerialised and not physically tangible and the users can explore them only by the mind. Anyway, Cyberspace cannot be called a paraspace because it is closely connected to human beings' lives as an experiential continuum. (Dodge, Kitchin, 2000).

What if we look at a definition of place, distance and time within the Cyberspace? Places in Cyberspace can be characterised as particular web pages or online services that are visited by users – kind of current inhabitants of Cyberspace. Places in Cyberspace have also their physical (view of the pages) and human (perception of pages) level. Basic and biggest difference between real geographical places and places in Cyberspace is that those ones visited in the cyber world can be accessed from anywhere in geographic space. These cyber places are based on new modes of interaction, new forms of social relationships and are centred on common interests rather than coincidence of location (Dodge, Kitchin, 2000). The problems can appear when one decides to locate any cyber place. E.g. when the web pages introduce an enterprise from Prague that is producing and selling its products in the centre of Prague, it does not mean that the data and information displayed on these web pages are localised (saved) in Prague. Servers on which data are stored can be localised wherever all around the world (Mašata, 2003/2004).

The distance of two points in terms of Cyberspace is in this case probably the most abstract geographical term. What does this distance mean? Is it a physical distance of two servers on which given data are stored (Mašata, 2003/2004)? From my point of view for the aims of Internet the meaning of distance partially vanishes and more important unit that can be used for measuring the "cyber distance" is time. Time during which data can be transferred from server to an user or from one user to another one. Also in this case there can be identified different constraints but these essentially differ from those defined by Thorsten Hägerstrand. Typical constraints for cyber distances measured in time units are quality of connection, current utilisation of servers, webpage performance quality, used browser etc.

“The idea of telecommunications as distance shrinking tool makes it analogous to other transport and communications improvements. The essential essence of advanced telecommunications is not to reduce the “friction of distance” but to render it entirely meaningless” (Gillepsie, Williams in Dodge, Kitchin, 2000, p. 14). To measure “cyber distance” usually means to count in time units smaller than one second. The differences between two different measured cyber distances are usually so irrelevant that the communication and connection between two cyber places can be named as instant. Some scholars talk about the “death of distance” that was caused by the existence of instantaneous communications in Cyberspace. This radical space–time compression made the social and capital relations much more free (Dodge, Kitchin, 2000).

But is it so acute with Cyberspace? Is it correct to claim that Cyberspace is destroying basic geographical regularities? In other words, does Cyberspace help render geographic space placeless? And does Cyberspace have places, and if so are they replacing those in geographic space? Does Geography still matter? This is an important discussion that should be lead over the topic of Cyberspace, especially among geographers.

Place and distance are obviously loosing their meaning within the Cyberspace because their definition and identification is complicated and provides many contradictions. The level of differentiation with the real geographical place and distance is too significant. It is argued that ICTs and Cyberspace are creating a “placeless” world (Dodge, Kitchin, 2000). Cyberspace is a placeless world and it has influenced and changed also the parts of the real world into the placeless one. Nevertheless, “placeless” places could be found in the real world before the origination of Cyberspace even so this placelessness has had a bit different meaning. Places that lack a "sense of place" are sometimes referred to as "placeless" or "inauthentic." Placeless landscapes are those that have no special relationship to the places in which they are located - they could be anywhere. Roadside strip shopping malls, petrol stations and convenience stores, fast food chains, and chain department stores are often cited as examples of placeless landscape elements [Wikipedia, Sense of place].

Meaning of distance and time is getting new dimension in Cyberspace and this difference makes impact on the real world human activities. This destruction of space by time is causing transformations within business or work patterns. It is moving to significant urban-regional restructuring (Dodge, Kitchin, 2000). Great discussion about in which fields we can nowadays see the impacts of ICTs and Cyberspace, how easily we all are becoming so called “cyborgs” and what kind of importance Cyberspace plays within the national economies and policies is lead in *William J. Mitchells* book “*City of Bits*”. There is no doubt that Cyberspace matters and cannot be displaced from the “real world” functioning.

Although online places might seem geographically dislocated, they are recursively connected to real places in a number of ways. One such way is through the individual user who accesses Cyberspace from a geographic site. Although an online place may provide a sense of belonging, the user may reside in an inauthentic place offline. “One must not overlook the fact that people still live in a material world and require food, shelter and human contact. In cases where

services can be decentralised, they still have to locate in areas of suitable skilled labour and conventional transport links. In other words, although ICTs work to destroy space–time relations, to render social relations “spaceless”, other spatial practices, forms and forces resist and work against this attrition” (Dodge, Kitchin, 2000, p. 15).

To sum up this discussion, there is undisputable claim - geography continues to matter. Despite of a huge impact of Cyberspace and its strong connection within the “real world” activities, geography was, is and will be an organising principle and a constituent of social relations. It cannot be entirely eliminated.

Paul Adams from University at Albany, Department of Geography and Planning presented a very interesting approach how to understand Cyberspace better in his paper. Using combinatorial theory (a method for comparing network forms) and structuration theory he identifies several network typologies that mirror their geographical equivalents in terms of their structure and the social interactions performed. He is trying to draw parallels between the sense of place imbued in a particular network architecture with those of “geographic” spaces. One of Adams arguments for such a typology is that relationships between physical/social structures and human agency are replicated online. Even this typology was created in 1998 and nowadays perception of network and Internet is already different in some cases I consider this approach as a very good step forward in comparing “real” and “cyber” worlds and finding important connections. Adams' found equivalents are:

1. Cybercasting (radial/one-way topology): This arrangement supports communication from one or few to many. This is the topology of radio and television. It is presently used for online magazine and newspaper text and for messages to users from the managers of computer networks. Architectural archetype includes the places used traditionally for ceremonial proclamations, lectures: temples, churches, theatres, lecture halls, auditoriums.
2. File search and retrieval (radial/two-way topology): This is user-driven information search and retrieval in which users extract text, images or sounds from central repositories. Search engines and indexes installed at central or peripheral nodes help locate material. Online examples include the World Wide Web, wire service reports, online encyclopaedias, education resources. Architectural archetype is significantly library and archives.
3. Email (one-to-one or one-to-many/one-way topology): This popular connection resembles regular postal mail except the messages travel much faster, and sending mass mailings to all members of a group is easier and cheaper. Network users can create their own lists or subscribe to mailing lists as a way to send and receive messages with persons in a group that is defined by similar interests. The main architectural archetype is the mailbox and the seclusion of a private room or office.

4. Computer bulletin board (radial/two-way topology): This arrangement is topologically identified with file searching and retrieval, except that the database that users search acts also as a repository for users' contributions. Users interactively search the messages of others and leave their own inquiries, comments and replies. Its main benefit is that it creates a living archive of the thoughts of a group of people, which other people can access whenever it is convenient. Architectural archetype is a bathroom stall with graffiti or a message board.
5. Computer forum (many-to-many, two-way): This arrangement is often referred to as the "chat room" or "electronic auditorium". It involves real-time discussion among spatially separated participants, all of whom are logged on at the same time and view each others' contributions instantaneously. Users can "listen in" or contribute their own comments. All of those "presents" see the same lines of text scrolling up their screens with contributions of themselves or others. A variation provides to gather and listen to an expert or celebrity. To reduce the confusion, such contexts are sometimes divided into "rows" and people see only communications in their own row plus a single speaker or speakers "on stage" for all of the rows. Architectural archetypes are in this case auditorium and central square, places that allow one to listen to a public speaker and also exchange comments with other listeners.
6. Multi-user environments (many-to-many, two-way): These contexts are similar to computer forums but have textual descriptions automatically inserted by a computer program which narrates the experience of being in an invented place. Such simulations include descriptions of views and descriptions of the actions of other users. The computer program also autonomously generates one or more characters that appear to take part in the game alongside the human participants and contribute in interesting ways to the fantasy character of the situation. Architectural archetypes are role-playing theme park, public space.

(Abridged from Adams 1998, p. 92–93)

Discussion about real and cyber world similarities does not end here. The Internet is usually defined as a space where physical distance of two points looses its meaning, as a space where no boundaries are and where no core place is. As it was already discussed above, some geographical terms in terms of Cyberspace does not have big sense. On the other hand, it is obvious that common interconnections between real space and the world of Internet are significant. Technical infrastructure, number of users, language environment, location of data storage and many more are still characteristics coming from real world (Mašata, 2003/2004).

There should be also reminded the differences before underlining the similarities between real and cyber world, which I recognised as the most important. Differences that will not be possible to overcome although the technological progress would be huge and all the human activities would be directly connected to Cyberspace. For instance, gravity does not exist in

Cyberspace. It has to be programmed and implemented by designer. There are usually no ground rules about how the Cyberspace has to look like so it can be altered at will (Memarzia in Dodge, Kitchin, 2000). “While some Cyberspaces do have an explicit spatial form (e.g., three-dimensional virtual worlds), they exist only in code, a combination of zeros and ones – objects are merely surfaces, they have no weight or mass” (Holtzman in Dodge, Kitchin, 2000, p. 61).

The movement within Cyberspace also differs from the movement in the “real” geographical space. The users of Cyberspace usually use logical links rather than physical paths to get from one place to another one. . These logical links are created by designers within the user interfaces that has to be clear and logical enough for the one who is trying to cross them (Mitchell, 1995). Also the sharing a place within Cyberspace is not quite the same as sharing a physical place like a room, a bed, or an umbrella in the rain. Physical environment demands the proximity of the bodies, which want to share given place. Cyberspace is different. “Bodies” do not need to be enclosed by the same architectural or natural boundaries. “The sharing” within Cyberspace means basically “simultaneous electronic access to the same information”. Users who share the same place within Cyberspace display in one moment the same text information on the screens of their computers (Mitchell, 1995).

On the other side, there are quite many similarities between the real and cyber space that should be mentioned because all these similarities make the real and cyber world closer. One should not forget that Cyberspace is still only a product of human activity so that it embodies certain signs of “reality”. First of all, if we think about the design of different web pages, online games, social network sites, we can easily recognise that designers of online spaces likely try to create them similar to real spaces. There is usually not a big will to create something totally new and unrecognized. Even different sci-fi games designs usually try to take an inspiration from already recognised spaces such as universe, planets. One example for all at this point - online game Second Life - is only one big copy of the real world with its daily activities, architecture, human behaviour etc.

The face of Cyberspace comes partly from our expectations; the expectations of users, inhabitants of Cyberspace, who are coming from the real lives. Typical online user visiting any kind of page is expecting that the space he or she is entering will be safe, comfortable, and friendly. Once the user expectations would not be filled, once the user would be threatened by a virus, once the user would not be able to orientate himself on these pages, he would probably not enter this Cyberspace anymore. The same as architects have to think about making the living environments save and comfortable, about filling the expectations of real human beings, so the designers and programmers of Cyberspaces have to think about the same expectations but in different space.

Internet, Cyberspace is often named as an anonymous space without any boarders or social limits, as a space where the people/users are equal. This claim is unfortunately not so faithful as it seems. Social structures and different types of user levels can be easily found on

different, especially social network pages. The way how users can reach higher “social” level once they are online can differ from the way how they would have to do it in their real lives but still the users are not equal. Cultural differentiation and exclusion, that operates in geographic space, works also online. Once the user thinks or realises the other user does not fit to his cultural preferences, the communication between these two users would probably quit or changed into different level. Also the gender roles that are practiced online are very similar to those one that can be seen in real world. There can be found many examples of patriarchal relations reproduced for the needs of Cyberspace. “Women in Cyberspace still attract the unwanted attention of men. They are still sexually harassed and receive abusive messages, and are still expected to adopt the same gender roles as in geographic space” (Dodge, Kitchin, 2000, p. 60).

After a long discussion over the most visible facts about Cyberspace vs. real space it should be said that even Cyberspace has a strong impact on the functioning of the real world and human beings lives, the real world and its geographical regularities will not disappear and will still matter. The invention of telephone did not cause that people stopped meeting each other. Also the Cyberspace will not cause the end of space as such. However, there is an important conclusion from this discussion and this is that the real world and we, human beings will be more and more dependent on Cyberspace, online services and their cross interconnections. Our lives, our activities or either activities of enterprises, nations will be recorded and digitised. Many processes will be shorten and speeded up because of the existence of Cyberspace. The world has entered the era of Cyberspace but will never loose some of its basic characteristics and regularities.

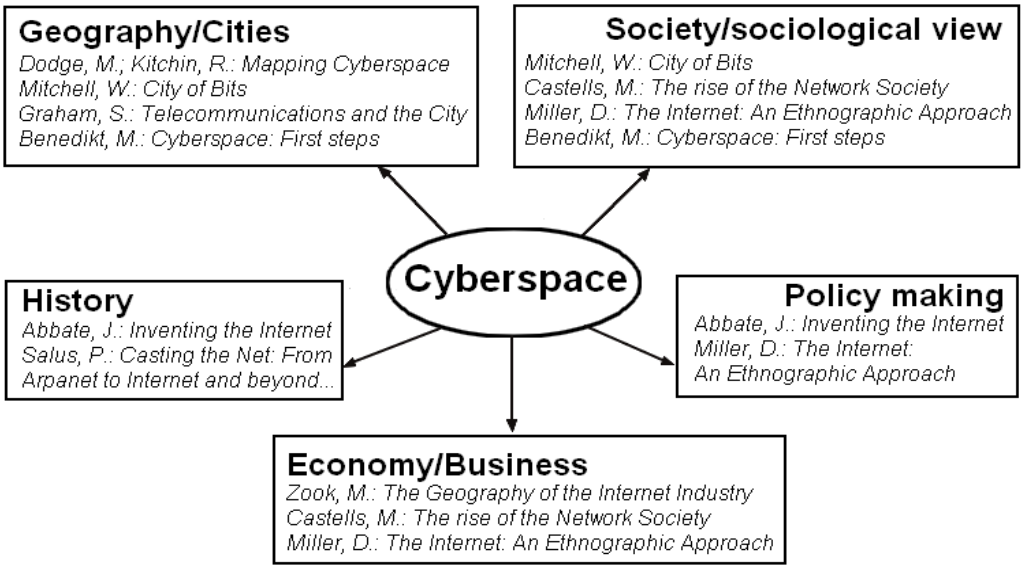
3.6 Works, researchers and institutions in Geography of Cyberspace

The basic stones of every discipline are formed by the most important works and surveys that are covering and enlarging the topic of discipline. Behind all these works and surveys there are researchers, teachers, visionaries and different institutions that are holding the discipline alive while deepening and widening its horizons. This chapter presents a detail debate that is trying to uncover and show the most important work that has been done around Geography of Cyberspace. Besides the introduction of the representatives and institutions there is a huge cross-discussion about the basic works, books that should be recognised for the aims of studying this discipline. As such, this chapter is the spring board to the other current topics, detail researches and for another works within Geography of Cyberspace.

The composition of the final list of the studied books is explained in the chapter 1.2 where is the argumentation about how and why I made the selection of the books, and in the chapter 2.1 where is the definite table of the books. After the reading through all the books I realised that the books should be evaluated in different levels of importance as well as divided into several areas of interest. All the books are talking about the topic of Cyberspace but each of them has different aim and focus. Diversity can be seen especially in their interest about the topic of Geography of Cyberspace. During the reading the strongest areas of interest concerning Cyberspace were recognised.

As can be seen in diagram below, Cyberspace as an inner topic is surrounded by basic fields of society, which Cyberspace influences. Much like geography is a complex science connecting and combining different fields and disciplines, the same can be seen when one is interested in Cyberspace. Although the basic topic and interest of this thesis is in Geography of Cyberspace it would not be possible to discharge the other themes, which supplement and make us understand the topic properly. The selected books touch on, besides the topic of geography, as well the topic of history of technologies, business and economy, society as such, urbanism, policy making etc.

Figure 3.1 Cyberspace within the other fields of interest and adequate literature



Although it is important to see the complexity of the topic through the selected books, during my reading and after it I tried to evaluate the books in terms of their direct interest in Geography of Cyberspace. The aim of this evaluation was to find out which books are the basic works of this discipline, to which books the biggest attention should be paid, and which books are only an additional reading material that should be recognised.

The strongest interest into the Geography of Cyberspace is in *Martin Dodge*'s and *Robert Kitchin*'s book "*Mapping Cyberspace*". It is the complex work covering especially geographical aspects of Cyberspace. I consider this book to be the basic work of this discipline. Another very important book that should be in attention of geographers interested in Cyberspace is the book written by above named authors, "*Atlas of Cyberspace*" that is in my eyes additional literature interested mainly in different maps and mapping methods of Cyberspace. For the aim of this thesis, the retrieval was written only for the first mentioned publication, "*Mapping Cyberspace*".

Because Cyberspace is in some way highly visionary topic calling for abstract and sometimes science fiction thinking, it is necessary to pay attention to the books with visionary views. The book "*City of Bits*" written by *William J. Mitchell* is one of those books. Even the thoughts, examples and experiences described in this book are sometimes beyond the current "reality", they make sense. This book widens the reader's thinking and shows him possible connections of his everyday life with Cyberspace.

The book of *Matthew Zook* "T*he Geography of the Internet Industry* brings an interesting point of view about Cyberspace. It is not interested in Cyberspace as such but about the new economy, new industry created around it and its geographical regularities.

The most significant and complex works on the impacts of Cyberspace on cities, urbanism, architecture etc. were written by *Stephen Graham* and *Simon Marvin*, namely "*Telecommunications and the City: Electronic spaces, urban places*" and "*Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*". Books are highlighting the importance of studying and exploring the topic of Cyberspace within the urban spaces. For the aim of this thesis, the retrieval was written only for the first mentioned publication, "*Telecommunications and the City: Electronic spaces, urban places*".

Two books written by Spanish sociologist *Manuell Castells* bring the best overview of the impacts of Cyberspace on the society. In the "*The Rise of the Network Society*" and "*The Internet Galaxy: Reflextions on the Internet*". Although this sociological approach goes farther from the geographical one and the researched topics within the books are not sometimes directly connected to the Cyberspace, Castells' works are important additional literature for complex understanding of the issue. For the aim of this thesis, the retrieval was written only for the first mentioned publication, "*The Rise of the Network Society*".

Before moving to additional literature that should be taken into the hands of geographer only in case he or she is truly and deeply interested in the topic of Cyberspace and Geography of Cyberspace, there is one more book that cannot be forgotten. Book called "*The Internet: An Ethnographic Approach*" written by *Daniel Miller* and *Don Slater* belongs to the essential readings dedicated to all students and researchers interested in the relationship between Internet technologies and society. This book should be read especially because of its very interesting approach used for better description and understanding of the impacts of the Internet.

For proper understanding of any science, research field, or issue it is necessary to explore its history; history of emerging as well as history of first thoughts and approaches within it. The history of Geography of Cyberspace is directly dependent on the history of Cyberspace that would not exist without the origination of Information and Communication Technologies (ICTs). The best description of the history of ICTs, Internet and WWW is covered by two books. *Peter Salus*' work "*Casting the Net: From Arpanet to Internet and beyond...*" that brings more detail and technical overview and *Janet Abbate*'s work "*Inventing the Internet*" that shows wider connections and explain more conjunctions about "why and how everything started". *Michael Benedikt*'s work "*Cyberspace: First steps*" is very interesting writing showing the first experiments to explain the Cyberspace, its functioning and further impacts on different parts of society.

In the introduction of this chapter I tried to write a brief description of the books I read and show the recognised differences and importance of the books for the aims of Geography of Cyberspace. I also tried to explain the division of the books into several areas of interest that should bring better lucidity to the researched literature. More detailed discussion over the books and application of the method of retrieval comes after in the following part of this chapter.

3.6.1 Discussion over books

The forthcoming retrieval is written in form of discussion over the books. Besides the formal description of the books, theirs contents and the most important parts, focus is given on pointing out where are the abrasive surfaces among the books, Geography of Cyberspace and geography as such. The discussion also contents the facts whom the book is designed for, how it should be read and understood, what kind of point of views or approaches it uses.

Important fact that should not be forgotten before the discussion itself is the comment about the years of publication of the books. There is no doubt that Cyberspace is one of the quickest (if not the quickest) developing and changing spaces we could ever experience. The development and shifts of new or already "old" Cyberspace projects are on daily, often on hourly base. There are many of examples that once an online service is not able to react promptly on needs and tasks of users or on attacks of hackers, there is high possibility that this service "dies". Under this fact the recency of the published books partly looses its value. Not to misunderstand this, the value of definitions, theoretical approaches, description of Cyberspace impacts or explanation of Cyberspace mapping methods will last even despite the Cyberspace would be changing every minute. For instance, many authors are trying to use different case studies, explaining projects and websites that were active and popular when the book was written, to complete their theoretical discussion. There should be clear that for the needs of forthcoming retrieval there were not used any of these case studies because they are no more relevant for nowadays functioning of Cyberspace.

The retrieval is written in three parts that represent three groups of books:

First part discusses basic works that I consider as essential books for Geography of Cyberspace. To this group of books belongs *Martin Dodge*'s and *Robert Kitchin*'s "*Mapping Cyberspace*", *William J. Mitchell*'s "*City of Bits: Space, Place, and the Infobahn*", *Matthew Zook*'s "*The Geography of the Internet Industry*", and *Stephen Graham*'s and *Simon Marvin*'s "*Telecommunication and the City: Electronic Spaces, Urban Places*". As complementary literature for this group there should be mentioned two more books – *Martin Dodge*'s and *Robert Kichin*'s "*Atlas of Cyberspace*" and *Stephen Graham*'s and *Simon Marvin*'s "*Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*". As it was already mentioned, this thesis does not content the retrievals for this couple of books because this would cross the requirements on the thesis.

Second group of books consists from works that were not written by geographers, but which are deeply and closely working with topic of Cyberspace and so giving an interesting and additional point of view to the issue. This group composes from *Manuel Castells*' sociological works "*The Rise of the Network Society*" and "*The Internet Galaxy: Reflections on the Internet, Business and Society*", and *Daniel Miller*'s and *Don Slater*'s ethnographic work "*The Internet: An Ethnographic Approach*".

Under the last group of books I understand clearly additional literature that allows the researcher to get more detail information to the topic. First more complex thoughts about Cyberspace are described in *Michael Benedikt*'s "*Cyberspace: First Steps*". Detail history of Internet and Cyberspace as such can be found in *Peter Salus*' "*The Net: From Arpanet to Internet and beyond...*" and in *Janet Abbate*'s "*Inventing Internet*".

- **Martin Dodge, Robert Kitchin (2000): Mapping Cyberspace**

As it was already mentioned, work of these two leading geographers within the Cyberspace topic is in my opinion the most complex work explaining Geography of Cyberspace from all different possible angles. The structure, the single chapters of the book cover all the topics that are more in detail discussed in other read books. The complexity of the book is its most important attribute because it helps the reader to understand the whole issue at once. As the authors argue, they provide a geographical analysis and critical reading of ICTs and Cyberspace, and their relationship to social, cultural, political and economic life. The book draws on the findings and theories of researchers in a number of disciplines including geography, cartography, sociology, cultural studies, computer-mediated communications, information visualisation, literary theory and cognitive psychology. Book also contents tens of examples of different studies made on Cyberspace to underline all important pros and cons of the issue. The three central arguments of the authors to this book are that also Cyberspace has a spatiality that needs to be researched; that the socio-spatial relations of Cyberspace are being created; and that Cyberspace is a new space. For this, it is important not to treat Cyberspace as some kind of paraspace (Dodge, Kitchin, 2000).

The book composes from twelve main chapters which are concurring and complementing each other. The first half of the book is more important for my needs because it directly comments Geography of Cyberspace and different concrete impacts on society. The second part of book is mainly dedicated to topic of mapping Cyberspace where the authors are explaining how to "visualise" Cyberspace into the form of maps. There can be find several typologies, created by authors, such as typology of Cyberspace maps, Cyberspace media etc.

The beginning is dedicated to the introduction explaining what is Cyberspace, how to define it, and to brief description of ICTs and Cyberspace history. Great attention is paid to part explaining why Cyberspace matters. Dodge and Kitchin are trying to comment different contradictions, such as space vs. spacelessness, place vs. placelessness, public vs. private, real vs. virtual, giving the questions whether Cyberspace caused the death of distance and places, whether Cyberspace is more public or private space, whether it supports global shifts or local interests. This part is highly valuable for geographers because it is trying to point out the main differences and similarities between "real" and "cyber" spaces, places, time, communities, behaviours etc. The main conclusion of this chapter is that geography continues to matter, despite all the impacts and changes Cyberspace caused.

Another part is dedicated to explanation of different scientific approaches and theories that are interested in Cyberspace but does not have to have primarily geographic character, like e.g. comments of utopian approach, social constructivism or political economy. The approaching Cyberspace chapter is more important for sections discussing geography of informative societies and geography of Cyberspace. The aim of these parts is to explain how the development and use of ICTs and Cyberspace affects socio-spatial and material relations of nowadays. There is detail discussion about how Cyberspace is transforming cultural, social, political and economic geographies. The authors focus on searching for spatialities of Cyberspace, concretely for spatial geometrics, structures and forms of Cyberspace. Within their discussion they never forget to compare the real and the cyber space, e.g. when they are talking about communities and identity. They are trying to pick important structures of urban, regional and global levels and comment the Cyberspace impacts on them, so that the reader is introduced into the changes within the trade, urbanisation, cities and their architecture, labour and employment structures etc. From the geographical point of view, this chapter should be taken as the core part of the book that is creating the closest contact between geography and Cyberspace.

As it was already mentioned before, the second part of the book is dedicated to the "cartography" of Cyberspace, to Cyberspace mapping, which is for sure very significant sub-discipline within Geography of Cyberspace, even though this topic is not so crucial for the aims of this thesis. Besides the brief description of cartographic history, authors try to examine the main reasons and challenges in geography for visualisation ICTs and Cyberspace because it is Cyberspace that is breaking the fundamental conventions. They are mentioning two traditional concerns about mapping, the problem with data quality and levels of understanding. Chapters dedicated to Cyberspace mapping are showing many different projects and maps that have been already created, e.g. maps of traffic, network nodes, demography of users etc. There is a big challenge and discussion about the spatialities of Cyberspace, because Cyberspace data given for mapping have usually no inherent spatial properties. While the "classical" maps of Cyberspace infrastructure should be created and understood easily, there is not such a simple situation when one decides to find the spatiality of online social media and the social interactions that occur through and within them. Authors took this challenge as well and dedicated two chapters to the topic of synchronous (one-to-one) and asynchronous (one-to-many) social media whereas the discussion is in particular focusing on how this media can be mapped and visualised. Cognition of geographical places and spaces is the topic of behavioural geography. Book "Mapping Cyberspace" is trying to understand this topic within the Cyberspace as well. Chapter is talking about the differences between the cognition of geographical space and Cyberspace by using different studies and results of usability tests. The main conclusion of this chapter is that cognition of Cyberspace is directly connected to its legibility. For this, to increase the usability of spatialisation of Cyberspace it is necessary to increase its spatial legibility.

The end of the book is dedicated to imaginative geographies of Cyberspace that are based on science-fiction thinking. Authors within this chapter are commenting tens of read sci-fi novels and they are using many of the novels' statements as kind of predictions for the Cyberspace future. Authors are ending with claims that Cyberspace is a powerful transformative agent that is blurring many boundaries between real and virtual, public and private, place and placelessness, mind and body etc. Putting down another research questions, they are trying to line next possible research themes for further research within Geography of Cyberspace.

The book is dedicated to anyone who is interested in Cyberspace, it is written not only for scholars or students of Geography but for general public. The language of the book is understandable and the book as such is highly readable. Even some of the described examples within the book are no more up-to-date, chosen case studies are giving the book an interesting supplement.

- **William J. Mitchell (1995): City of Bits: Space, Place, and the Infobahn**

The title of William J. Mitchell's book evokes that this book will be probably speaking only about the impacts of Cyberspace on current cities. Contrary is the case, the book brings interesting view over different parts and activities of everyday lives depending on the existence of Cyberspace. It uncovers surprising truths and logical knowing that one usually does not think about. Mitchell's approach in this if book is not theoretical, he is not trying to find regularities or generalise his findings. His book is highly visionary towards Cyberspace and despite of it was published 15 years ago it still surprises nowadays by his thoughts about the impacts of Cyberspace. His work contents unusual and very interesting terms, such as cyborg, soft cities, bit biz, bitsphere, net body, that better explain the impacts on very basic parts of human beings' lives.

The parts and content of the book consists basically from hundreds of examples from different places and situations, from his life, academic experiences, and realised projects on different places that were directly connected to Cyberspace. It consists from seven parts within which Mitchell is trying to get to the core of issues.

In short, on the beginning of his book he is making an introduction discussing different contradictions, similar to Dodge and Kitchin in their book, to underline the most important and common impacts of Cyberspace on the real world. For instance, he is discussing topic spatial/antispatial when his understanding of Internet is purely “antispatial”. He says that Cyberspace does not have the same boarders and limits as the real space but there are characteristics such as network typology, connectivity, access. He is also commenting the identity making online whereas the basic question he is asking is “With whom are we dealing online? With real people or programmed agents?”.

Next part is dedicated to human being in the era of Cyberspace. Already the name of chapter, Cyborg Citizens, prepares the reader for the fact, that Mitchell considers all people using any kind of electronic tool as Cyborgs. His definition of a Cyborg is that it is a person who relies on electronic devices for daily activities. Our eyes, ears, muscles, hands can be substituted by cyber tools, such as robots, microscopes, micromanipulators, web cameras etc. And the perfect synchronization of these devices we daily use can lead us to kind of net body.

Mitchell pays great attention to impacts of Cyberspace on urban space. He is deeply discussing the topic of changes in current architecture, city infrastructure, flows within the cities, such as traffic, trade, services, labour force etc. When focusing on architecture, he argues that buildings are no more only fully equipped constructions but that they are becoming kind of artificial intelligent and helpful places connecting people/users with Cyberspace. He uses many examples from academic environment, libraries, bookstores, galleries to better explain these architectural changes. Soft cities – is this new type of city or just transformation under new phenomenon within the city boarders? Soft city is basically a city with highly developed network system, which enables it to gain a competitive advantage in the global marketplace. “Soft” cities are basically “information” cities grown around a high-tech infrastructure of computer networks. Their functioning and infrastructure is usually monitored and controlled only by these computer-based networks. The economic engine in these soft cities of Cyberspace is the bit business – the production, transformation, distribution, and consumption of digital information (Mitchell, 1995). Mitchell considers also money as only information within Cyberspace. He does not forget to mention the problem of security within Cyberspace and the fact, that all our cyber steps are recorded. His popular statement is that instead of Big Brother we are witnessing the era of Little Brothers in form of web pages, online services, and other cyber tools. His conclusion to the bit biz topic is that the world is experiencing new economical order and Cyberspace is a part of it.

The last chapter is dedicated to a discussion about the bitsphere. Mitchell defines it as a global, electronically run environment. Bitsphere is full of different networks, and most of its inner components, which are functioning at every scale (from nano to global), have intelligent skills and telecommunication capabilities. He argues that bitsphere will have big impact on economy and living standards and this will lead to creation of the new political economy of Cyberspace and strong national information infrastructure (Mitchell, 1995). This is what he sees as a future shift of global system.

Mitchell's book is dedicated to anyone who is interested in Cyberspace issues and is seeking for rather non-scientific work. From the academic point of view, every researcher and student working on Cyberspace topic, should read this piece because it points out important practical impacts of Cyberspace. These are sometimes forgotten within purely theoretical books.

- **Matthew Zook (2005): The Geography of the Internet Industry**

As it was already explained in chapter describing history of the Internet, the thoughts about it commercialisation appeared after few decades of purely academic dedicated projects. Once there was a thought to use the Internet for commercial purposes, we can talk about the beginning of the Internet industry. As the use of the Internet by business becomes increasingly common, the distinction of being an Internet-using company has begun to have as much significance as being a phone-using or fax-using company. Matthew Zook's publication is very interesting work that is covering this topic as a whole and giving it appropriate importance. In short, this book focuses on factors and dynamics behind the creation, clustering and retrenchment of this new industry from 1994 to 2003. This book is one of those publications that chose only one significant impact of Cyberspace and referred to the necessity to study this chosen problem.

Cyberspace is one part of a new economic order, the Internet industry is a new field within it. The connection with Geography of Cyberspace and especially with social geography is obvious. New shifts in global economy, new indicators that directly affect the economical functioning of the world, are one of the most important interests of geographers. As Zook complements, “in order to analyze the role of geography in the development of the Internet industry it is first necessary to describe its spatial distribution. The recent and non-hierarchical nature of the Internet, however, makes studying its geography difficult” (Zook, 2005, p. 7).

The content of the book consists from nine main chapters, starting with introductions, definitions of new terms, history of this industry, moving towards explanation of importance of venture capital within this industry, showing different case studies and research of this book, and finishing with dot-com firms definition and their closer explanation. For the aims of this book, Zook uses basically one big case study on San Francisco Bay region. By the help of this case he is trying to explore the regularities of the industry and contra, he is trying to apply his findings on it. As he argues, the object of study of his book is the Internet and dot-com companies, which are typical for 3 basic attributes – their business model runs within the Internet; they expect extra fast growth; and it is a venture capital that usually stands behind them.

Zook starts with an introduction where stating that the Internet industry is a “placeless” industry where the importance stands basically on inner organisation and unique, tacit knowledge. Wider definition of the Internet industry within the pages of this book says that although this term is routinely used and generally used its definition cannot be diminished just into the form of a specific sector, business model, or firm type. In fact, at the most basic level, the indication that given enterprise is from the Internet industry is that it uses the Internet in some form. On the other hand, he says, that not all the companies which use the Internet are dot-com or Internet companies (Zook, 2005). The aim of the first chapters is a brief description of the history of precommercial Internet and the contours of the global geography of its use. In the chapter “Mapping the Internet industry” he presents the results of his own research on concentration and clustering of this industry in the United States. In chronological order, he shows the progress of the numbers of commercial domain names whereas the outputs are given primarily in the tables and maps.

Other chapters are dedicated to the financing of the Internet industry enterprises. Zook argues that the key factor in firm formation within the Internet industry and the consequent regional development is the provision of financing for firms. He is adding this statement with an analysis of the amount and destination of venture capital investments and shows that the clustering pattern of the Internet industry is closely tied to venture capital investing. However, this finding should not be taken so unilaterally. Zook claims, that simple access to the venture capital does not automatically mean the entrepreneurial success (Zook, 2005). This is one part of the book where Zook uses the experience of the San Francisco Bay region as an example of the value and use of knowledge by venture capitalists.

After the central part of the book that is mostly interested in venture capital within the Internet industry there are two chapters discussing basically over the dot-com firms. First of all, there is an interest to explain and define this new type of firms. As it was already mentioned above, he identifies the dot-com companies using 3 characteristics – type of business model that should be focused on Internet; expectations of the firm to grow extra fast; and venture capital as a type of investment. The chapters highlight the widespread faith in the transformative character of the Internet and the strong ambition and motivation of people working in dot-com firms. Zook finishes his work with statement that the process of innovation and creative destruction is closely linked to the Internet industry. The era of dot-com enterprises is particularly the manifestation of this recent process

Zook´s book is very inspiring and forces the reader to think about economical consequences of Cyberspace. As can be greatly seen within the book, Cyberspace did not become only a space where users started to change their identities, where the understanding of time and distance has got different meaning. Cyberspace became a space with new business opportunities, permanent money flows, and nowadays – space of most successful and most valuable firms.

From my point of view, the book is dedicated to general public, as to the scientists. The language of the book is understandable and amended with many examples from the “real world”. Besides geographers, this book has a lot to tell to the economists as well.

- **Stephen Graham, Simon Marvin (1996): Telecommunication and the City: Electronic Spaces, Urban Places**

This publication can be taken as a first critical and covering work of the relations between telecommunications and all aspects of the city development and its management. It shows that the effects of telecommunications on cities are very complex and still unclean than it was ever expected. The authors of the book were trying to put together a more scientific and considered approach to analysing the complex relations between cities and telecommunications. The cities are for them the spaces with strong inner reactions between the urban place and electronic space. The authors basically ground their analysis in a comparative evaluation of the theoretical approaches that were available in the time of writing. For this, they are often underlining the need to study

telecommunications within urban studies. Although this book is a detail study over impacts of telecommunication technologies on cities, there can be feel an unsure attitude about how to catch this issue (Graham, Marvin, 1996). The relationship of this book with Geography of Cyberspace is obvious. Although the authors are speaking about the impacts of telecommunications or telematics, this should be understood as an entry of Cyberspace into the urban space. Urbanism, geography of cities, restructuring within the urban areas is important topic of social geography, and therefore it is a close topic to Geography of Cyberspace.

The authors claim, that the application of new telecommunications technologies and infrastructure caused the crossing of spatial barriers within the urban areas and made the environment act instantaneously. It can be said that telecommunications adjusted the space and time barriers. The authors like to use also the term telematics that refers “to services and infrastructures which link computer and digital media equipment over telecommunications links”. In their eyes, “telematics are providing the technological foundations for rapid innovation in computer networking and voice, data, image and video communications”. One should also think about the fact that telematics operate at all geographical scales – from within single buildings to transglobal networks (Graham, Marvin, 1996, p. 2-3).

In general, the authors name the impacts and changes within the society and systems as different kinds of restructurings. The result of the application of telematics is that cities have been restructured from enclosed places with the inner economies to open units, which operate on the level of international and global economic networks. There can be observed the shift from the “local” into the “global”. The key actor of this restructuring is the instantaneity of telematics networks (Graham, Marvin, 1996).

The book consists from eleven chapters whereas first chapter is dedicated to detailed introduction of the topic and the last chapter represents a large conclusion. In introduction part authors are covering all the basic and most important statements and definitions related to the topic. There should be said, that the introduction of this book is a very valuable part that makes the reader understand the basis of all impacted urban areas. The attention is paid to an overview of the telecommunication history. The authors are describing phone invention, origination of digital technologies, bit flows, computers later on. This telecommunication evolution has caused also restructuring within the telecommunication companies in different countries. The introduction part also mentions the social and cultural changes in the cities, impacts of telecommunications on transportation and infrastructure systems and on the work of policy and urban planners.

Next chapter deals with out-of-date way of looking at cities. The authors argue that contemporary approaches neglected many telecommunications-based changes that started to appear within the cities and urban life. Authors call for the need of new conceptual frameworks which would map and explain these changes more precisely.

Third chapter is a chapter of approaches. Here chosen approaches and theories authors decided to use for the aims of this book are commented. They evaluate different theoretical perspectives that can be used for the recognition of relations between the city and

telecommunications. Authors used four approaches – technological determinism, utopianism and futurism, urban policy economy and the social construction of technology. The output of this chapter is a creation of a new approach that provides a framework for the rest of the book.

Next chapters are dedicated to different key aspects of city-telecommunications relations. These aspects are development of urban economies, the social and cultural life of cities, the urban environment, urban transport and infrastructure, the physical form of the cities and urban planning, policy and governance.

The most important findings and conclusions of the book can be summarised into several statements. The authors claim, that we are witnessing the new type of urban world rather than a post-urban world. Telecommunications are one of the important factors of the globalisation of current economy. The transnational corporations have created global networks whereas the cities have become their fragmented nodes. The authors point out that the similar technologies can be used in very different ways and have very different effects. The effects of telecommunications on the cities also seem to vary depending on different places and time periods. In other words, the impacts of telecommunications on cities are not and cannot be predefined through some concrete technological logic or by some automatically generated statements of political economy. When focusing on the social front, the authors say that telecommunications can help to overcome isolation, disadvantage and disability, as well as furthering the degree to which the “information poor” are marginalised. Everything in the current cities, the old tangible aspects of the urban lives, interacts continuously with the intangible electronic actors. Fixed buildings and other constructions within the urban spaces are directly connected with unfixed electronic networks. This is where the authors see the basis for definition of contemporary urbanism. The other findings about the telematics say that also the public sphere is being influenced in different ways. There can be seen the strengthening of the public local dimensions of cities as well as the social fragmentation and atomisation. Telematics are also seen as assistants in the search for sustainable development of the cities. On the other side, they can help with the growth of highly unsustainable cities. The authors were searching also for linkages between the telecommunications and transport infrastructure in the cities. They found out that the demand for both, transportation and telecommunications has been growing rapidly. The authors see the current trend of the communications intensive societies in growing flows of goods, people, services, information and data (Graham, Marvin, 1996).

The final chapters are dedicated to a discussion over physical form of the cities. The authors argue that the electronic spaces are similar to the landscapes and shifts of the contemporary cities in their diversity. The electronic spaces have also segmentations, divisions and social struggles as the traditional geographical spaces. The era of telecommunications caused that we are able to experience so called “black holes” and “electronic ghettos”, as well as intense concentrations of infrastructure in city centres and elite suburbs. The authors also stress that physical proximity has lost its importance and meaning with the existence of electronic spaces. This proximity has a little to do with electronic proximity. Although the authors are showing and

explaining many impacts of telecommunications on contemporary cities, they are ending with a confident claim that the growth of electronic spaces is not somehow leading to the dissolution of cities. They are saying that the basic urban functions have not been completely substituted by dematerialised acts of electronic spaces. Cities as places still matter – this is the fundamental aspect of urban civilisation. The last words of the book are dedicated to the future ideas. The authors are here calling for the need of reconfiguration of urban studies and urban policy-making in the ways which would directly reflect the increasingly tele-mediated nature of contemporary cities (Graham, Marvin, 1996).

Book written by Graham and Marvin should be taken for a highly complex work with a high value within the Cyberspace studies. The book is written in readable language and tens of used examples make its reading even more interesting. Although the recency is not the strongest site of this book, it should not be missing among the obligatory and essential literature read by urban geographers, researchers or students, focused on critical topics of urban geography.

- **Manuel Castells (1996): The Rise of the Network Society**

Manuel Castells is a world leading sociologist. His interest into new shifts of society caused by different external factors, has been always significant. From all his works dedicated to research on social impacts of Cyberspace I chose one – The rise of Network Society. From my point of view, this work is the most complex and compact in terms of Cyberspace area.

As he argues, this book focuses on the emergence of a new social structure, manifested in various forms. This new social structure is in his eyes associated with the new mode of development, the era of informationalism, shaped by the changes and restructuring of the capitalist type of production towards the end of the twentieth century (Castells, 1996). Within his book, it can be seen that Castells leans on many different studies. He is trying to provide a wide range of different opinions towards the reader whereas he is ever not taking one as a true one.

His book is a very comprehensive work which covers and explains in detail many sites of society in the new era of information. All the chapters are compilations of theoretical approaches, his findings or chosen studies that should supplement the theoretical statements. Not always direct connection with Cyberspace topic can be found, there is a little connection with Geography of Cyberspace as such. Despite of all this, the book is a valuable guide through the new shifted society which have arisen from the technological revolution. In this case, I decided to describe the most important findings within the chapters.

The book consists from prologue and another seven chapters that are creating together kind of a compact story about the network society. The prologue of the book is successfully trying to get the reader into its main theme when using also several examples of technological evolution from China or Soviet Union. The author is briefly talking about the history of technology and its revolution. He argues that it is not technology that determines historical evolution and social changes. Technology (or the lack of it) is just an actor that represents the capacity of societies to transform themselves.

The first main chapter focuses on information technology revolution, more detail overview about the technological and network history, introduction of the main inventions etc. Castells argues that if the first industrial revolution was British, first revolution in information technology was then American with the cooperation of other nations and scientists. He considers the information technology revolution at least as important and historical as was eighteenth-century industrial revolution. He understands the information technology as the same source of the technology revolutions as what new sources of energy were to the successive industrial revolutions. For this, the end of the last century became one of those rare moments characterised by the transformation of our "material culture". He defines in this part three stages that were passed after the appearance of new telecommunications technologies. These are the automation of tasks, an experimentation of uses, and a reconfiguration of applications. In the first two stages, he says, "learning by using" caused the progress and innovations. In the third stage, it was the "learning by doing" when the users were those ones who learnt technology. Nevertheless, the core argument of this chapter which Castells mentions within the whole book is that the spread of technological revolution and new system is not equal; many places are switched of this improvement. In this part, he mentions also origination of Sillicon Valley as a milieu of innovation. It became a convergence place with high technologic knowledge where many companies (technological equipment, networking, portals) were originated.

Next chapter of the book is dedicated to the discussion over the new economy. Castells is trying to answer the question whether we are nowadays experiencing the real new economy or only a mature industrial economy. As he claims, new economy has appeared in the last quarter of the twentieth century on global scale. He is giving it three main attributes - informational, global, and networked, to identify its fundamental features. He says that a new economy is informational because the productivity, success and competitiveness of economical units depend on their capacity to generate, absorb, and use efficiently knowledge-based information. It is global because the core activities of production, management, consumption, and other flows are organised on a global scale. It is networked because the global network of interactions between business networks is the main mover of productivity and competition. On the other hand, global economy is not a planetary economy. It does not include all economic processes in the planet or all geographical spaces. It does not affect directly or indirectly all people in their works and live hoods (Castells, 1996). The chapter contents many observations and studies whose aim is to proof the statement that the technology plays the fundamental role in nowadays economic growth. Castells is opening many related topics that are underlining the global character of new economy, such as global financial markets; global flow of goods and services; internationalisation of production; international production networks etc. When looking at the new economy in terms of information, Castells stresses that productivity and competitiveness in informational production are based on the possibility of knowledge generation, information processing and the technological capacity of firms and organisations.

After the deep explanation of technology revolution and appearance of a new economy, Castells shifts his attention on the network enterprises. The third chapter is basically trying to define and explain the new organisational form of the informational and global economy– the network enterprise. Castells is on the beginning commenting different trends and economical systems (e.g. Fordism) on the way to network enterprise. His understanding of networks is in terms of connections and bindings among and within the enterprises and their production. On the other hand, these networks would not be possible to realise without computer networks. Networks act as gatekeepers. Inside the networks, new possibilities are being created. Outside the networks, survival and success is very difficult. The actual operating units of discussed technology revolution are networks, not anymore the single firms. It is a networking that became the fundamental form of competition in the new economy. The complex definition of network enterprise is then “a specific form of enterprise whose system of means is constituted by the intersection of segments of autonomous systems of goals”. There are many different cultures, values, and projects standing behind the final thoughts, decisions and strategies of these enterprises. The network enterprise has to learn to live within the virtual culture that was created by computers in Cyberspace (Castells, 1996). There is one more story mentioned within this chapter that is worth to mention. Castells is describing Cisco System, enterprise that means for the Internet companies the same as Fordism. More than a very successful company, the author calls it a trend-setter of the global networked business model. This model seems to have become the predominant model for the most successful competitors in most industries around the world.

Castells' interest of the next chapter is in transformation of work and employment in the era of information, within the network society. He is giving a brief overview about the history of work force, its evolution and main changes. This time, he uses many statistical data and analysis to document his statements. This analysis should also show the main changes within the work force structures. Castells defines also several typologies of “informational work process“. The main conclusion of this chapter is that informational technologies caused many changes within the work forces, their structures, style of work, working hours, work environment etc. Basically, the access of informational technologies made everything cheaper and quicker. On the other hand, it seems that there is no direct structural relation between the spread of information technologies and the changes in the employment levels of the new economy. Jobs are being displaced and new jobs are being created without any dependence on new technologies. The results of the interaction between information technology and employment are much more dependent on macro-economic factors, economic strategies and socio-political contexts. Castells pays specific attention to the influence of information technologies on the unemployment. His finding is that information technology does not cause unemployment, even if it obviously reduces working time per unit of output (Castells, 1996).

Last three chapters of the book differ from the previous ones. Their content is more focused on Cyberspace as such. Castells introduces and explains here his three concepts – concept of real virtuality; the space of flows; and timeless time.

The fifth chapter uncovers the approach of real virtuality. Within this chapter, Castells introduces also the general impact of mass-media on society. This introduction leads to the origination of the Internet that has changed some perceptions of users. Basically, the audience of this medium moved from passive to interactive. As a critical milestone of the changed character of communication he mentions the formation of hypertext and a meta-language. This invention integrated into the same system the written, oral, and audiovisual forms of human communication. Internet helped with creation of a new type of community. A virtual community, which is generally understood as a “self-defined electronic network of interactive communication organised around a shared interest or purpose, although sometimes communication becomes the goal in itself”. He argues that virtual communities do not have to be opposed to physical communities. They are just different types of community, with its typical rules and dynamics. The virtual communities do not follow the same patterns of communication and interactions as physical communities do. But this does not mean they are “unreal“ (Castells, 1996).

After the explanation of new media impacts and creation of virtual communities, Castells pays his attention to the definition of the culture of real virtuality. He says that there has emerged a new culture, the culture of a real virtuality, which rose up from the influence of the new communication system. This was conditioned by social interests, government policies, and business strategies. Why he suddenly decided to use this term instead of the already known term “virtual reality“? Why he switched these two words in terms to describe the “virtual world“ as it is? Basically he claims that in a sense, all reality is virtually perceived. All of us perceive the world around within our own experiences, imaginations, opinions, within our own virtuality. For this, it is not accurate to call the newly created “virtual world behind the screens of monitors” as a virtual reality. For this, Castells calls it “real virtuality” that is created by a new communication system, in which the appearances from the screens of monitors become the experience (Castells, 1996). The first of approaches, introduced by Castells, is highly interesting and brings another point of view into the Cyberspace discussion.

Castells starts the last chapter with basic statements about the space and time. He says that space and time are the fundamental, material dimensions of human life. It is important to add that space is the expression of society, not its reflection. This dependence underlines the fact that since the societies has been undergoing structural transformation, the new spatial forms and processes have emerged. In other words, space is not a photocopy of society, it is society itself. The Castells' statements from the previous chapters were that the society is constructed around flows: flows of capital, flows of information, flows of technology, and flows of organisational interaction. He sees that there has appeared a new spatial form characteristic for the network society: the space of flows (Castells, 1996). In other words, the space of places has, within the network society, changed into the space of flows. Although people still live and will live in the real places, the power of nowadays switched into the existing flows. This chapter deals also with impacts of informational technologies on the cities, as the representatives of places within the space. For Castells, cities of this era should be named as informational cities, and understood

not as a form but as a process. A process characterised by the domination of the space of flows.

The end of the book, the last chapter, belongs to the third Castells' concept – to the introduction of timeless time. It is directly connected to the concept of the space of flows. The basic statement about the time is that the time, in nature as in society, seems to be specific to a given context. As Castells simply says, time is local. This proposition cannot work within the space of flows, within Cyberspace. The reason why is that it is impossible to define the given context, the understanding of "now" within the space of flows. Timeless time belongs to the space of flows, while the geographical places are still determined by the time discipline, the sense of biological time. Timeless time is the outcome of the negation of time, past and future, in the networks of the space of flows (Castells, 1996).

The work of Manuel Castells belongs to the most complicated and complex books read for the aim of this thesis. For these reasons, I would say that this book is dedicated basically to the researchers and students who already have some background in this topic.

- **Daniel Miller, Don Slater (2000): The Internet: An Ethnographic Approach**

Work written by Daniel Miller and Don Slater, ethnographer and sociologist, is an interesting publication viewing the Cyberspace topic from a totally different angle. First of all, the book is basically a case study, a complex research done by the authors on Trinidad, where they tried to investigate how Internet technologies are being understood and assimilated somewhere in particular. Because their approach is ethnographic, they are basically interested in behaviour of Trinidadians and the changes that Internet caused within their society and place. As they argue, they are analysing "how the members of chosen culture attempt to make themselves at home in a transforming communicative environment" (Miller, Slater, 2000, p. 1). It should not have been forgotten that the research results were current in 2000 when the book was published.

The book consists of seven basic chapters. First two chapters are an introduction to the topic and explanation of the research. There is also an overview of the Internet existence in Trinidad. The next chapters are explaining Internet impacts on different parts of Trinidad society, such as family relationships, political economy, business or religion.

In the overview chapter authors found out that the use of the Internet on Trinidad was much more widespread than they had expected. The Internet on Trinidad became important for the individuals to be stylish. From the national point of view, Trinidad attempted to launch itself into the vanguard of modernity. The chapter centred on relationships revealed that the Internet has strengthened the families, allowing closer relations between parents and children, between siblings. Internet had also great impact on the extended families. It helped to create new, online relationships between Trinidadians and people of other countries, when some of them lead to marriage. Another chapter paid attention to the national identity of Trinidadians and how the Internet transformed it. Surprisingly, the findings showed that the Internet became for Trinidadians a tool for representing and promoting their country to the rest of the world. There has been created many web pages, driven by Trinidadians who even supported the national awareness and

identity of Trinidad. Fifth chapter of the book is dedicated to the political economy of the Internet where the authors investigated how Trinidad's network of connection providers was created. They found out that the local telecomm monopoly played the critical weakness in ideal development of the Internet services and providers in the country. Trinidad was for this identified as an exception within the global neoliberal and deregulation policies that have been intensified in the rest of the world. Commenting the economy, authors focused also on the growth of the online business on Trinidad. They defined a three-stage model of e-commerce development. It was found out that the advertising agencies played an unexpectedly muted and negative role in the development of web sites and e-commerce. Last chapter made its interest in religion and the Internet. Authors' findings were that various religions communities were actively using the Internet to resolve problems of space and location. The Internet space was often used for unorthodox theological discussions what caused many pros and cons for the religious bodies. Authors summed up, that the Internet may be read as a divine model of the future of a Church.

The most important findings of the book, that I identified, are connected to the topic of national identity and identity as such. As the authors argue, it seemed self-evident that the Internet would lead to a reduction in national identity and nationalism, since the Internet is a global rather than a national technological invention. The final findings show how misleading their forecasts turned out to be. It was the nationalism that was fully strengthened and extended. This is not at all to say that nationalism or national identity is unchanged. They also claim that online and offline worlds penetrate each other deeply and in complex ways, whether people are using the Internet to realise older concepts of identity or to pursue new modes of sociality (Miller, Slater, 2000).

Daniel Miller and Don Slater put together very interesting work even its recency has lost its value over the time. Their writing closely introduces to the reader concrete impacts of the Internet on a chosen society. It could be seen that even logical expectations can be finally disclaimed. Book is dedicated to the researchers or students who want to understand better the possible direct impacts of the Internet. Findings described in the book can be a very helpful tool for deeper thinking about the topic.

- **Michael Benedikt (1992): Cyberspace: First Steps**

The book edited by Michael Benedikt is a composite book consisting of different articles about Cyberspace. These were written for 1st Conference about Cyberspace or, as Michael Benedikt argues, directly for this volume. As the year of publication shows, this book is one of the essential works about Cyberspace. It covers first views and statements about Cyberspace, as well as the visionary thoughts toward the future. The articles are discussing topics such as space vs. Cyberspace, relevance of the body, cyborgs and cyber bodies, coming dematerialisation of architecture etc.

Book consists from fifteen independent chapters whereas first half of the book is dedicated to general thoughts and introductions to the Cyberspace. Second half is more focused on particular issues. Benedikt himself wrote two chapters of the book. His introduction to the book

is written in a very abstract way where he is describing several different typologies that are not directly connected to Cyberspace (typology of Worlds, typology of Threads). Another chapter written by him is dealing with discussion over Cyberspace, geography, space, real and virtual worlds, visualisation of it.

Because the style of this book totally differs from the rest of the retrieved books I decided not to describe the whole content of the book, chapter by chapter, but point out the most interesting and important findings within it.

For instance, Benedikt argues that Cyberspace is just a described space, which does not exist. On the other hand he claims that Cyberspace has its own geography, physics, a nature, and the rules of human law. In Cyberspace everybody can follow his or her own needs. The users of Cyberspace can search, manipulate, create or control given information directly. They can entertain themselves, win or lose, they can "live" or "die" as they want (Benedikt, 1992).

Another author says that Cyberspace is more than a new technological invention, a revolutionary solution in electronic media or in computer interface design. Cyberspace offers the possibility of virtual environments and simulated worlds. It became a tool for examining our very sense of reality (Heim in Benedikt, 1992).

Marcos Novak, who wrote the part discussing about the architecture, defined Cyberspace in a wider way. For him, Cyberspace is a "habitat of the imagination, a habitat for the imagination". He says that Cyberspace has its own architecture. From technical point of view, Cyberspace is architecture itself. He is coming with special name of this architecture - a liquid architecture. It is a dematerialised type of architecture, which is no longer satisfied with the traditional aspects of the real world, such as space, form, or light (Novak in Benedikt, 1992).

One chapter is dedicated to the discussion over the virtual worlds. Virtual world is here defined as an environment of pure information, which we can see, hear, and touch. The technology itself is invisible and carefully adjusted to the human activities. A virtual world can have the same characteristics at the real one. It can be informative, useful, or fun, but also boring and uncomfortable. As it is the architecture and infrastructure solution that makes the differences within the real world, it is the design that is the most important component in creating comfortable, functional virtual worlds. Cyberspace technology puts together the functions of the computer with human capabilities (Bricken in Benedikt, 1992).

One of the authors deals with the corporate sector within the Cyberspace. He says that the traditional perceptions of business success do not work anymore. Corporations themselves are becoming diverse and geographically far-reaching. The author claims that informational technology is going to be the primary driver toward new corporate architectures. He is focusing on the changes of workspaces whereas the new technology is for him determinant of these shifts. He sees the results of this change formation of so called Corporate Virtual Workspaces, highly productive replacements for current work environments (Pruitt, Barrett in Benedikt, 1992).

As it can be seen, statements within this book are naming Cyberspace differently, sometimes they are contradictions to themselves, sometimes the definitions seem as

ambiguous thoughts that are trying to catch any kind of more specific fact. From my point of view, this book is good as a complementary literature for one interested in Cyberspace. Because its coverage is quite general, it can be read by general public, researcher or a student of different specialisation.

- **Peter Salus (1995): The Net: From Arpanet to Internet and beyond...**

Peter Salus' book is bringing an overview about the history of the Internet. The book describes in detail first technological steps and development of network or “the Matrix” how is Internet network called in this book. Basically, it explains many technical details and mile stones that had to be done and passed on the way to current network state. This publication is mainly descriptive in the way it shows the facts. There are not wider discussions about the reasons why the development of Cyberspace took this path and not the other one. The book as such contains lot of additional materials like email conversations between the network representatives, different schemes and sketches that appeared during the network evolution what brings to the reader interesting background information.

Content of the book is divided into five parts that are covering time lines from the 1940 till 1994. Each part is describing the most important stories that happened in the cyber world. This retrieval is giving only brief overview about the content of the book because the information and facts from this book can be found already in chapter 3.2 that is dedicated to the history of Cyberspace as such.

The first part is covering years 1940 till 1964 and very first signs of “network” experiments on different academic places. Then, the book focuses on other foundations in the field of Matrix between the 1967 and 1972. That was the time when the first packet switching was implemented, ARPANET project was introduced and first email was sent. The third part of the book is highly interesting because it describes the first steps of networking in the rest of the world, in European states and in Asia. It covers time line from 1974 till 1981 and describes also the first steps in network commercialisation. This chapter comments on the beginnings of email communication. Even despite it is written on highly technical level, it can be still clearly understood that the first mail sent between “two machines” is dated to the very early 1970s. The last but one part is covering time line from 1982 till 1989 and commenting topics such as Europe and Asia networking in 1980s and reorganisation of the Net. The last part of the book is covering time period between years 1988 till 1994. This part is describing first Internet applications that were developed as well as commercial background of the network and its first security problems.

After the reading of Peter Salus' book it can be said, that it is dedicated to non-technical readers interested in the history of Internet who can briefly read the main stories of the book, as well as to technical readers who are more interested in details and technical steps of whole development and infrastructure of the network.

- **Janet Abbate (1999): Inventing Internet**

Book written by Jane Abbate is similar to one commented above. The aim of the book is also to cover and explain the history of the network. More precisely, book traces the history of the Internet from development of networking ideas and techniques in the early 1960's to the introduction of the World Wide Web in 1990's. The most important difference is that this publication presents not only a list of facts and mile stones. It tries to fill the gap from other books about computers, which are missing wider explanations of this history. It brings the reader an overview in terms of connections on political situation and other timely demands that helped and forced the development of Cyberspace. As Abbate argues, only few authors have looked at the social shaping of the computer communications, so that is why she is "trying to point out the most important social and cultural factors shaping the Internet." These events and decisions created the conditions off possibility for the Internet's current status as a popular communication medium. As she also mentions several times, Internet has not been an isolated act of invention. "In the history of it the meaning of Internet had to be several times invented and reinvented" (Abbate, 1999, p. 3-4).

The book contains six main chapters that are a chronological story about the history of Internet. It is unnecessarily to repeat the facts and information that have been already said about the history of Cyberspace. For this, retrieval of this book is focused on the main and strongest qualities and findings of the book.

Introduction part offers an overview of what happened before the invention of Arpanet. The author is commenting Cold War situation and the need of "survivable communications" that would prevent possible dangerous situations within the national security. As Abbate repeats several times, computing technology was and still is nothing else than a political instrument. Another part is dedicated to the Arpanet and the very detail description of this project. It should be said, that as in the rest of book, Abbate does not focus so much on technical information and data of given technological steps. She is much more commenting on dependencies and strategies that caused these steps. As she further argues, the users of the network projects were very important determinants of their development. When Arpanet reached its mature time, also historians started to pay attention to the roles of active users in determining the features and ultimate success of technology. Next chapter of the book is dedicated to the birth of the Internet. Symbolic comments are given to technological changes and switches, as well as to other successful projects of that time. Because the size of the network started to grow up quickly, international standards for Internet had to be accepted. This is the main topic of fifth but also sixth chapter where the author comments on adoption of TCP/IP and Domain Name System, commercial standards from 1980's. As she argues, these technological standards were not anything else than a control over technology, political issue again. Because the popularity of Internet has obviously grown, there was also bigger interest about its monetarisation. Abbate comments this as a "time when the Internet transformed itself from research field into a popular medium" (Abbate, 1999, p. 182). This popularisation brought also negative consequences, such as first data network standards battles or first monopolistic practices. The last chapter of this book mentions also important fact of

spreading of the Internet into “peripheries” for which network connection was till that time inaccessible.

This book is dedicated to anyone interested in Cyberspace history. Because it contents historical conjunctions and occurrences that conditioned the further development of networking, it is bringing complex understanding for those, who wants to know this history better.

The retrievals of the selected books showed a wide scope of different publications, explaining different impacts of Cyberspace. Almost all of them discuss the changing perception of space, place and time, even if their focus is not purely geographical. These books have enlarged my knowledge of Cyberspace and its possible impacts. It can be said that I was sometimes even surprised about the possible connections between the Cyberspace and the real space. Selected books create a good base for Geography of Cyberspace. These works, especially those interested in geography as such, should be read by social geographers who are trying to understand and explain different social-geographical aspects.

3.6.2 Researchers and institutions

Where are the current hot spots of the research in Geography of Cyberspace? Which universities, institutions, laboratories do pay attention on the Cyberspace phenomenon? It is not easy to answer this question because the hot spots of research have been changing during the time as well as the coverage of the researchers.

The identification of the most important „Cyberspace research“ places were directly connected to the author names of read books and their localisation. My research on this topic, while I was focusing primarily on English speaking countries, brought out that the most important names within the past and current Geography of Cyberspace are Martin Dodge, Ph.D.; Prof. Rob Kitchin; Prof. William J. Mitchell; Prof. Stephen Graham; Mathew A. Zook, Ph.D.; Prof. Manuel Castells and Daniel Miller, Ph.D.. The path of current Cyberspace research has followed the previous path of origination of Cyberspace. For this, the current two most important placements of interest and cyber research activities are in the United States and in the United Kingdom. Because from my point of view it is important to know the background and basic information about the named researchers, part of this chapter is dedicated to their introduction.

Martin Dodge, Ph.D. and Prof. Robert Kitchin belong to the most important representatives. Even despite the fact that their research has moved over to other fields of interest, their work on Geography of Cyberspace remains of key importance.

Martin Dodge, Ph.D. is currently a lecturer in Human Geography in the School of Environment and Development at the University of Manchester where he has been actively working in many projects. He is also a researcher in the Centre for Advanced Spatial Analysis (CASA) at University College London. As he himself argues, the area of research he is developing

over the next few years concerns the broad relationships between digital technologies and the production of space, what might be termed the geographies of code. Besides the Cyber-Geography Research and Code/Space research, where he was one of the initiators, his other fields of interest are e.g. social applications of GIS and geographic visualisation, information visualisation and new ways of representing data, open source cartography, user-generated geographical data, geographical dimensions of surveillance, data monitoring, and spatial tagging and tracking [Manchester University pages: Martin Dodge]. The Cyber-Geography Research, which was his and Prof. Robert Kitchin's common work, was focused on the more quantitative aspects of measuring and mapping geography of Cyberspaces. The outputs of this research consist from already discussed publications – “Mapping Cyberspace“ and “Atlas of Cyberspace“. The ongoing Code/Space Research, again common work of him and Prof. Robert Kitchin, is seeking to develop new conceptual tools for understanding the relationship between software, technology, space and everyday activities [Code/Space Research pages].

Prof. Robert Kitchin is professor in Human Geography as well as director of National Institute of Regional and Spatial Analysis (NIRSA), both within the National University of Ireland in Maynooth. His fields of interest are always framed within a geographical framework while his main specializations are social and cultural geography, in particular issues of disability, sexuality and cyberspace, as well as cognitive mapping and other spatial studies [NIRSA pages: Robert Kitchin]. As it was mentioned above, he was one of the initiators of the most significant researches in Geography of Cyberspace. He is the author or editor of 17 academic books, editor of an academic journal; he has edited a 12 volume encyclopaedia. His own or co-authored publications concerning the issues of Cyberspace are e.g. “Cyberspace: The World in the Wires” or “Lost in Space: Geographies of Science Fiction”.

Prof. William J. Mitchell is the Alexander W. Dreyfoos, Jr. Professor of Architecture and Media Arts and Sciences at the Massachusetts Institute of Technology (from now on MIT) in Cambridge, Massachusetts. He also directs the Smart Cities research group at MIT's Media Lab which members are creating innovative ways to change how we live in urban areas, mainly the application of new technologies that enable urban energy efficiency and sustainability, and enhance opportunity, equity, and cultural creativity. He was formerly a Dean of the School of Architecture and Head of the Program in Media Arts and Sciences at MIT with past experiences from lecturing at the Harvard Graduate School of Design, UCLA's Graduate School of Architecture and Urban Planning, Yale, Carnegie-Mellon and Cambridge Universities. In 1997 he was awarded the annual Appreciation Prize of the Architectural Institute of Japan for his "achievements in the development of architectural design theory in the information age as well as worldwide promotion of CAD education." Mitchell is currently chair of The National Academies Committee on Information Technology and Creativity [MIT university pages: William J. Mitchell]. William J. Mitchell is the world's leading guru of how city life has changed in the age of wireless communication and author of the cultish book “Me++: The Cyborg Self and the Networked City“, “Placing Words: Symbols,

Space, and the City“, “e-topia: Urban Life, Jim--but Not as We Know It" and many others. Although William J. Mitchell is not a social geographer his interest in Cyberspace is deep. The importance of his work is especially in terms of his visionary thinking and imaginations that can be very helpful for any researcher who is trying to measure future impacts of the cyber phenomenon.

Prof. Stephen Graham is a Professor of Human Geography at the University of Durham as well as the Deputy Director of the Centre for the Study of Cities and Regions. His basic interest and focus is on networked urbanism, when his research explores the urban implications of new technologies, especially Information and Communications Technologies for urban life, the importance of mobility and infrastructure in urban life, the links between cities and surveillance, and the relationships between cities, war and terrorism. His interest in Cyberspace can be seen within his publications such as “The cybercities reader”, “Telecomunnications and the City: Electronic Spaces, Urban Places”, “Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition”. His perpetual interest in urban changes under the technological influence is very important since urban spaces, especially cities are the main areas where the pace of technological change is highest [Durkheim University pages: Stephen Graham].

Mathew A. Zook, Ph.D. is an associate professor at the Department of Geography at the University of Kentucky. As he himself claims, his research focuses on technological change and shifting geographies of globalisation. This interest, however, does not over-privilege the technical aspects of technological change but embeds it in larger societal systems (politics, culture, regulation, etc.) which engender innovation and in turn are changed in a mutually constitutive process. His research is categorised into four main topics while three of them are very strongly connected to the Cyberspace. Within “Geography of e-commerce” he is trying to show how the use of IT and the Internet interacts with existing systems of economic production, distribution and consumption. Within the “Software created spaces (code-space)” he is exploring how code, space and place interact as people use of digital technologies (particularly mobile ones) to navigate through cities. Within the “Internet geographies” his interest is focused on where and how the network of networks touches places and people. And finally within the “Global air travel geographies” he is trying to find out how differences in history, position and power simultaneously draw some places nearer and makes others relatively more "distant" to the global economy [University of Kentucky pages: Matthew Zook]. His interest in Cyberspace can be seen also in his publication activities while he is author of “The Geography of the Internet Industry: Venture Capital, Dot-coms and Local Knowledge” and author of tens of articles published in recognised scientific magazines and parts of different volumes. Mathew A. Zook has also cooperated with Martin Dodge on several papers.

Skipping from the field of geography, another important researcher in the field of Cyberspace is well-known Spanish sociologist, **Prof. Manuel Castells**. He is a Professor of Sociology and Director of the Internet Interdisciplinary Institute at the Open University of Catalonia (UOC), in Barcelona. He is as well University Professor and the Wallis Annenberg Chair

Professor of Communication Technology and Society at the Annenberg School of Communication, University of Southern California, Los Angeles. Other lecturing experiences are from the University of California, Berkeley, where he taught for 24 years [Manuel Castells, personal pages]. His involvement and interest into the Cyberspace and new technologies brought him e.g. possibility to be appointed to the Governing Board of the new European Institute of Innovation and Technology (EIT) created by the European Union to stimulate the research cooperation between universities, business and society. The sociological career of Manuel Castells is long and the interest and content of his work has been changing depending on the current changes and strong modifications within society. His interest into Cyberspace and its impacts on society has lasted for more than 20 years according to his publications and research projects. Even his orientation and thinking is far from the geographical topics, his thoughts, ideas and views over the changes within the network society can be a great benefit for the geographer interested in Cyberspace.

As another interesting person within the Cyberspace studies, who is not geographer as well but can widen and uncover other parts of this issue, is **Daniel Miller, Ph.D.**, professor of Anthropology at the Department of Anthropology at University London College. His main area of interest is in material culture, but besides this he pays his attention to other areas, such as consumption and relationships, value and political economy, digital anthropology and media etc. Especially the last mentioned interest is directly connected with the Cyberspace studies. As well as one of his current projects called “Migration, New Media and Relationship (and Digital Anthropology)”, where in cooperation with Dr. Mirca Madianou from Cambridge University are researching the use of new media, such as the phone and the Internet, webcams and social networking sites, in maintaining relationships between people separated over long time periods [University College London pages: Daniel Miller]. Because the works of Daniel Miller are usually in form of case studies, his anthropologic view on Internet and Cyberspace gives us detail ideas about how are the direct impacts of Cyberspace and Internet usage on different societies, policies, economies, religions etc.

After the introduction of the key representatives within the field Cyberspace and especially Geography of Cyberspace it is also necessary to point out the most important institutions dealing with the researches over these issues.

It is obvious that the primary named institutions should be the universities and departments that are the home grounds of the mentioned academicians. Although the researchers are used to work and cooperate with other researchers from out of their home universities, their home universities give them basically opportunities and conditions for development of their thoughts, works, and projects. To sum them up, my cognition of the most important Cyberspace research hot spots showed these academic places:

- School of Environment and Development at the University of Manchester, Manchester, UK
- Department of Geography at the National University of Ireland, Maynooth, IE
- National Institute of Regional and Spatial Analysis (NIRSA), National University of Ireland in Maynooth, IE
- Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA
- Department of Human Geography at the University of Durham, Durham, UK
- Department of Geography at the University of Kentucky, Lexington, Kentucky, USA
- Department of Anthropology at University London College, London, UK

Except them there are two more institutions that have to be mentioned as important sources of Cyberspace research and further outputs – one of them located in the United Kingdom, the second one in the United States.

First of all, Centre for Advanced Spatial Analysis, CASA, is an initiative within University College London (UCL) to develop emerging computer technologies in several disciplines which deal with geography, space, location, and the built environment. As an interdisciplinary research centre expertise is drawn from archaeology, architecture, cartography, computer science, environmental science, geography, planning, remote sensing, geomatic engineering, and transport studies. This generates a unique blend of personnel who operate from CASA and associated departments within UCL [CASA, official pages]. CASA is currently (March 2010) working on 15 researches while their number is changing depending on current interest and possibilities of new projects. To show several examples affecting, Geography of Cyberspace there should be mentioned the previous projects “Atlas of Cyberspace” with aim to create this atlas of maps and graphic representations of the geographies of the new electronic territories of the Internet, WWW and other emerging Cyberspaces. Another project, “London Environment Online”, was focused on the creation of an Environmental Information System (EIS) that was available over the Internet, designed to communicate environmental information about London in an easy to use and intuitive manner. One of current interesting research, “Digital Differentiation: Consumption Profiles of Fracturing Digital Divides” was basically working on the detailed nationwide analysis of consumer access to new ICTs, a classification of households in terms of their type of use and access to digital technologies. As can be seen, the CASA platform offers wide range of possibilities to work on interesting and current, often interdisciplinary projects which the only output does not have to be only theoretical book but any kind of applicable outcome.

Second significant institution that should be mentioned in connection with Cyberspace is MIT Media Lab, working under the wings of Massachusetts Institute of Technology in Cambridge, Massachusetts in the United States. As it can be heard from the representatives of MIT Media Lab,

it is a place where the future is lived, not imagined. The domain of MIT Media Lab is applying unorthodox research approaches for envisioning the impact of emerging technologies on everyday life, technologies that promise to fundamentally transform our most basic notions of human capabilities. The work of Media Lab has been lasting for more than 30 years while during all this time the realised projects were always highly innovative, opened to new emerging technologies and experimental expressions. Computing and ICTs became in last decades one of the most important points of interest within the Media Lab researches. When mentioning research, this is provided at MIT Media Lab in form of research groups that are working on different projects in the long term. Nowadays (March 2010), there are 25 active research groups while direct connections with Cyberspace issue have majority of them. For instance, the aim of research group “Affective Computing” is to show how new technologies can help people better communicate, understand, and respond to affective information. The project “eRationality” is focused on explanation how we can understand human behaviour (rationality, semi-rationality, bounded rationality, and just plain irrationality) in day-to-day behaviours, and in particular in electronic environments. One for the end, project “Software Agents” has as its aim to show how software can act as an assistant to the user rather than a tool, by learning from interaction and by proactively anticipating the user's needs [MIT Media Lab, official pages].

Researchers, universities, institutions, laboratories are the tangible elements of any science and discipline. When one wants to learn more about the discipline, he should also learn about the scale of researches and work of institutions that are widening the frame of the discipline. Previous part tried to reach this aim. As it can be seen, Geography of Cyberspace has already strong institutional roots in this world and these roots are also interconnected. Different initiatives in this research field originated independently or depended on each other. The research that is provided within these mentioned places is very active and it is usually reacting on new recognised impacts of Cyberspace and ICTs within the different parts of society.

3.7 Geography of Cyberspace in Czechia

This thesis paid a great attention to the most important researchers, books and institutions that are dealing with Geography of Cyberspace. As it could be seen, the strongest roots of this discipline are in the United States and in the United Kingdom. Because I am a student of Czech university, my interest was focused also on the hot spots of this discipline in Czechia.

In this chapter I tried to put together works, names and institutions that can be recognised as the representatives of Czech Cyberspace research. I did not succeed in finding a department, institute or individual researcher who would be working only on Geography of Cyberspace. For this, further lines mention also institutions that specialise themselves in other fields than geographical ones.

First of all, I focused on the closest place - my home university and department where I study. At the moment, there is not any compact research dealing with Cyberspace or any kind of its impacts, on society, urban areas, policy making etc. Only few optional subjects taught within the department are talking in general about the existence of Cyberspace studies within the social geography. The most significant steps can be seen among the absolvent works, thesis and diplomas, that are recognising in different ways the impacts of Cyberspace or Internet. For the aims of this chapter I chose three of them that, in my opinion, are the best representatives covering different approaches in Cyberspace studies.

The closest view into this field provides master thesis "*Cyberspace: the new dimension of geography, psytrance and information networks*." from 2006, written by *Petr Kučera*. This thesis aims itself on mechanisms in social networks within Cyberspace. Especially first half of the thesis focuses on explanation of Cyberspace. The author tries to explain implications in geographical structures and space, place and time understanding. Thesis shows new qualities of communities and community ties in virtual places (Kučera, 2006).

Another master thesis presented at my home department is dealing with the existence of informational society. The name of the thesis is "*Informational society, local actors and their contact networks: Pilot study of selected firms in Plzeň*", written by *Eva Janouškovcová* in 2007. This thesis focuses itself on current phenomenon – information and bucket brigade. The author deals with the processes in recent informational and globalised society when she is trying to explain the importance of contact networks, forms of communication, and message transmission between chosen actors. The areas of her interest are information rich areas, in cities and agglomerations. Obviously, this thesis is an interesting work showing the impacts of Cyberspace on cities and the local actors, the local development (Janouškovcová, 2007).

The last selected thesis, written by *Kateřina Susová* in 2009, is called "*Influence of Internet on community life in suburbs*". The aim of the thesis is to describe new possibilities arising from the using of the Internet by residents of suburban communities. The attention is paid mainly on the potential benefit for community building and building of social capital. The author argues that

the Internet forums can significantly contribute to increase of civic or political engagement and the overall growth of social capital in the chosen areas. Her interest within the Cyberspace topic is in impacts of this phenomenon on society, its inner networks and bindings, created with the aid of the Internet (Susová, 2009).

My next observation was pointed on other faculties of my home university and the thesis written on their grounds. The interest in Cyberspace and Internet impacts studies was found basically within the humanistic studies at Faculty of Social Sciences, Faculty of Humanities and Faculty of Arts. Examples of such a master thesis are e.g. paper written by *Viktor Lazarov* in 2005 carrying the name "*Cyberspace as a tool of construction of a new reality*"; master thesis by *Petra Nováková* from 2009 named "*Czechs and risks in the cyberspace: Quantitative analysis of the Internet usage and risk perception by population of the Czech Republic*"; or paper written by *Milada Boháčová* in 2008 carrying the name "*The Norms of Internet Communication*".

While exploring the academic ground, I decided to get a brief overview about the interest of students from Masaryk University in Brno. The reason why I chose this university is simple. Faculty of Law is yearly organising conference with name "Cyberspace" where every year this topic is discussed. Second reason is a web-based journal Cyberpsychology that is under the responsibility of Faculty of Social Studies. For this, my expectations were that the students of this university should be more interested in Cyberspace because of this direct academic influence. My expectations were filled. Search within the thesis and diplomas written at this university showed tens of papers with cyber issue. Here are several chosen titles from all – thesis "*The Pioneers of Cyberculture: Cyberpunk and Digerati*" written by *Kateřina Stojaspalová* in 2009; thesis "*Information Blocking on the Internet as Ambivalent Implement*" written by *Markéta Ilková* in 2009; thesis "*Newromancer": Cyberspace and Utopia* written by *Jan Hejral* in 2009 or thesis "*Identity and online games addiction*" written by *Ondřej Ledabyl* in 2007.

It can be seen that the interest in Cyberspace topics is great and significant. Although there were found many papers which picked up as a central topic any kind of implications of Internet, networking, Cyberspace on society, there was not found any work that is covering Cyberspace topic as such, from its essentials, beginnings, first steps. What more, there was not found any paper covering Geography of Cyberspace.

Another sign of Cyberspace research was found on personal pages and blog pages of *Mgr. Radek Mašata*. Already the name of the pages evokes the closeness with Geography of Cyberspace when the basic URL are <http://www.cybergeography.net/> and <http://cyber-geography.blogspot.com/>. The owner and author of the content, incidentally absolvent of regional and political geography at Faculty of Science, Charles University in Prague, deals with this discipline. Although it seems that his research work within this field is not active at the moment there can be found several papers about Cyberspace. For instance, he is the author of articles

published in magazine Geografické rozhledy - "*Geografická specifika kyberprostoru*"[1] and "*Diferenciace přístupu obyvatelstva k internetu*"[2]. Especially, the first named article is very important for Geography of Cyberspace because it is one of the few articles published in Czechia about this discipline. Besides the publication activities, the pages of Mgr. Radek Mašata content definitions of informational society and bunch of external links to other web pages with Cyberspace issue. From my point of view, evaluated researcher made a very good step within this field in terms of Czech research and it would be valuable to continue in his tracks.

More technical interest about Cyberspace can be found at technical institutes and academic grounds in Czechia. One of the most significant examples is Department of Cybernetics at Czech Technical University in Prague. This department is basically aimed at high-quality research in artificial intelligence, machine perception, robotics, and biomedical engineering with the focus on multi-agent systems, machine learning, data mining, pattern recognition, knowledge-based systems, medical data processing and collaborative robotics [Department of Cybernetics, ČVUT, official pages]. The closer view on the pages of the department shows that the goals of the researchers and students are kind of visionary and basically practical. The perception of Cyberspace is mainly via creation of new types of tools, machines, robots, that would help the human beings with their daily activities. Similar aims can be seen in MIT Media Lab that was introduced in chapter 3.6.2. Simply said, this department is helping us to become the real cyborgs with electronically extended bodies (Michell, 1995).

The academic interest about a topic usually means also the organisation of international conferences. These are very important in terms of widening of informational base, inviting other interested researchers from abroad who bring different points of view about the topic, and keeping the discipline in action. Although there is none conference focusing directly on Geography of Cyberspace, it can be spoken about two important happenings within the boarders of Czechia. One conference, named CYTER, focuses basically on cyber terrorism and cyber crime. Second one, named Cyberspace, focuses on topics as cyber law, psychology, social impacts etc.

CYTER, Cyber Terrorism and Crime Conference, passed during the June 2009 already its third year of existence. It is organised under the auspices of Czech Technical University in Prague, in cooperation with Ministry of Interior of Czechia. All the three years of conference basically covered broad spectrum of topic from technology and networking to sociological and psychological effects of Internet misuse. The politics and global view of the cyber terrorism and cyber crime creates integral part of conference [Cyber Terrorism and Crime Conference, official pages]. From the wide scale of topics opened and discussed on this conference at least some of them should be named. For instance, topics as international cooperation against terrorism and links between

1 Descriptive translation of this article's title for the needs of this thesis is "The geographical specifics of Cyberspace"
2 Descriptive translation of this article's title for the needs of this thesis is "Differentiation of access of the inhabitants to the Internet."

terrorism and other criminal activities; usage of the Web by terrorist organisations as a communication, intelligence, and propaganda tool; cyber investigations and digital evidence – the presence and future; or cyber terrorism awareness and education.

Conference, simply named Cyberspace, prepares in 2010 already the 8th year of its existence. It is organised under the auspices of Faculty of Law in cooperation with Faculty of Social Studies, both belonging to Masaryk University in Brno. The topics of conference differ every year depending on current and hot topics in Cyberspace, Internet, and information networks. The streams for the year 2010 are cyberlaw, psychology and sociology of Cyberspace, philosophy of Cyberspace, or religion in Cyberspace and information security [International Conference Cyberspace, official pages]

Both conferences should be considered as the high valuable happenings that are helping to deal with the most emergent impacts of Cyberspace. The outputs of the sessions have practical utilisation which means great help with the real solutions of these impacts.

As it was already mentioned above, the activities of Masaryk University in Brno within Cyberspace field are various. Another focus on Cyberspace can be seen via the articles of journal Cyberpsychology - a web-based, peer-reviewed scholarly journal. Journal has published its first articles in 2007. Its focus is on social science research on Cyberspace, while it is bringing psychosocial reflections of the Internet impacts people, behaviour, and society. The journal is interdisciplinary, publishing works written by scholars of psychology, media studies, sociology [e.g. Konečný, 2009], political science, and other disciplines. The Cyberpsychology Journal brings original papers, as well as theoretical studies and research meta-analyses [Journal of Psychosocial Research on Cyberspace].

Direct research on Geography of Cyberspace within the Czech boarders does not exist at the moment. Previous chapter showed that despite this, there are quite many academic activities connected with Cyberspace topic. Although this chapter does not content full list of works and papers explaining Cyberspace impacts (e.g. Novobilský, 2003), I tried to pick the most important ones. This brief introduction of the Czech Cyberspace research should also show that there are already several, quite stable concerns among other research fields and specialisations, e.g. sociology, psychology, technical subjects. Hopefully, this will become an inspiration also for geographical departments and institutions to ground their own, geographically aimed research.

3.8 Sub-disciplines of Geography of Cyberspace

The last chapter of this part of the thesis is dedicated to introduction of chosen sub-disciplines of Geography of Cyberspace. The scale of possible commented sub-disciplines is wide which could be confirmed with the tens of different papers, researches and analysis of different Cyberspace topics. For the aims of this thesis and this chapter, I chose five sub-disciplines. The process of choosing was based on several conditions as level of interest among other sub-topics (community and identity; mapping cyberspace), level of acuteness in terms of global problems (conquest in Cyberspace and i-Islam; censorship) and level of personal interest (mobile Internet phenomenon).

The discussion over these chosen topics is very brief and basic. The aim of this chapter is not in the detail description of the chosen themes but pointing out the importance of their research. Selected sub-disciplines can be also an inspiration for the further research and work within Geography of Cyberspace.

3.8.1 Community and identity

In my eyes, this topic is one of the most studied topics within the Cyberspace studies. Basically, the community and identity creations in Cyberspace became an interesting topic for researchers from sociology, psychology, cultural studies, but as well geography. Possible threats that could grow up from creation of illegal communities or dangerous identities are the interest of criminalistics or even antiterrorist organs.

What kind of questions are tried to be answered in this field? For instance, what kinds of differences are between real and virtual communities? Can virtual community operate in real world? Do virtual communities help to strengthen cultural bindings or are the impacts opposite? Is it really dangerous when somebody changes his identity when being online? Can the change of identity help some of excluded individuals with their better socialisation? Is Cyberspace helping to make regional or national identity stronger or is it opposite? And how far can go the activities of illegal Internet communities? How big is the threat of “freedom within Cyberspace“?

Before introduction of another sub-discipline, it would be interesting to write small overview about existing opinions and statements talking about the communities and identities. The community, real or virtual one, is characterised by such factors as personal intimacy, moral commitment and social cohesion. The physical real world is a space where people are easily able to identify and position the other ones they communicate with. The information about the other ones are well known, fixed, and highly visual. The virtual world overcomes the boarders and limitations such as physical distance, time or social prejudices. But it also reduces the possibility to indentify other users. We are usually able to encode the other ones identities only from the words on a screen. Although we can use the Cyberspace to play with our identity, our online personae are

grounded in our overall experiences and inner memories (Dodge, Kitchin, 2000).

The basic question that appears when one thinks about real and virtual communities is whether the Internet user perceives Cyberspace as another place of his life and daily activities or not. Users usually wish to bracket Cyberspace and geographic space into two separate domains, as could be for example seen from the results of qualitative research among the exchange students that is a part of this thesis (see chapter 4). Anyway, the spill over is inevitable as both join to form a single experiential reality. The social interactions that take place in Cyberspace clearly have a significant influence on some people, changing their outlook and values. Moreover, the depth and strength of some relationships can lead to radical changes in a person's offline life. Another way that Cyberspace is materially grounded in geographic communities is through the development of identifiable subcultures explicitly focused around ICT technologies. As a good example is Cyberpunk (e.g. Kučera, 2006) and other youth groups of interest which meet in Cyberspace, but also physically in cybercafés, nightclubs and communes. Like geographic communities, these online communities have behavioural norms, differing personalities, shared significance and loyalty (Dodge, Kitchin, 2000). Simply said, it is wrong to consider Internet communities replacements for geographic communities (Wellman, Gulia, 1999) as well as to believe that our Cyberspace life does not have any impact on our "real" life.

3.8.2 Mapping Cyberspace

Cyberspace - the network of connected people, computers and places, which are wired by high-speed telecommunications networks. On the pages of this thesis it has been recognised that Cyberspace is quite different from the physical world. The traditional concepts of geography are no longer valid (e.g. Mašata, 2003/2004). The relationship between Cyberspace and the physical space is becoming increasingly important. There is an urgent need to understand, deconstruct, map and visualise the complex spatiality of Cyberspace (Cai, Hirtle, Williams, 1999).

Important work within this topic has been already done by Martin Dodge and Robert Kitchin in their publications "Mapping Cyberspace" and "Atlas of Cyberspace". First of them is trying to explain the spatiality of Cyberspace and search for possibilities of its mapping, visualisation. The authors are also dealing with cognition of Cyberspace and introducing several, already realised mappings of Cyberspace (Dodge, Kitchin, 2000). Second publication, as the title already evokes, is a compilation of different maps and illustration of Cyberspace. It consists also the information about which new cartographic and visualisation techniques have been employed. The atlas is a very good example of what kind of different mappings can be done within Cyberspace, e.g. maps of Internet infrastructure and traffic flows, maps of the Web, maps of online conversations and communities etc (Dodge, Kitchin, 2001).

Besides these basic works, there have been published tens of other different papers, especially articles reflecting this topic. For instance, article written by Guoray Cai, Stephen Hirtle, and James Williams (Cai, Hirtle, Williams, 1999) "presents a layered framework within which

different views of Cyberspace are discussed. Important spatial properties of each layer are identified, and approaches for deriving those properties are proposed." The paper basically offers the suggestions of spatial models that can be applied to telecommunications infrastructure data. The aim of the paper is the better understanding of the geographical distribution of the network connectivity and access bandwidth. These models should be finally applied, e.g. for the reason to evaluate the spatial effectiveness of telecommunications infrastructure (Cai, Hirtle, Williams, 1999, p. 146).

One more example is written by Mei-Po Kwan (Kwan, 2001). In the paper he examines "individual access to information on the Internet through a cognitive-behavioural perspective". The aim of his paper is the good cyberspatial cognition because, as he argues, this is crucial in constituting the effective cyber-environment and shaping human cyberspatial behaviour. Current structure of the information resources in Cyberspace is not good enough for understanding the experience of individual accessibility. The paper offers concrete proposition of a behavioural model of cyber-accessibility. The attention within the article is paid on the theories about spatial learning, cognitive mapping, and decision-making behaviour, which are helpful for understanding individual cyberspatial behaviour (Kwan, 2001, p. 21).

Last note to the Cyberspace mapping topic is dedicated to web pages that are interesting sources of current outputs of Cyberspace mapping. Personal blog pages, simply called "Internet Geography" [Internet Geography Blogspot], are full of different maps, schemas or videos which are by use of different methods showing different characteristics of current Internet. As the author himself says, this blog is an inventory of the most visually appealing, simple, creative and accessible representations of Internet geography [Internet Geography Blogspot]. One chosen example of an interesting map of Cyberspace is the cloud map view of the relative proportion of languages used on the Internet.

Figure 3.2 Cloud map view of the relative proportion of languages used on the Internet

Source: <http://internetgeography.blogspot.com/>, 5.4.2010

3.8.3 Conquest in Cyberspace, example of i-Islam

"The popularisation and commercialisation of the Internet is what has turned it into a potential space of warfare. It is not only that defence systems of advanced militaries are being knit into more powerful systems of systems. The real impetus is that the more Cyberspace is critical to a nation's economy and defence, the more attractive to enemies is the prospect of crippling either or both via attacks on or through it." Hackers, the soldiers and attackers of cyber spaces, can decide which part of Cyberspace to attack to cause the worst troubles. On the other side are defenders, the owners of the systems, national institutions, which must keep these hackers out of their systems. The scale of the possible hackers attack is wide, from the stealing of information, or the injection of phony information into chosen systems, to the full destruction of the cyber system. The level of attack usually depends on the importance of the attacked system. Nevertheless, Cyberspace has joined air and outer space as a new medium of conflict (Libicki, 2007, p. 1-2).

This introduction is just a very little from the wide topic of possible threats that has been created with the origination of Cyberspace. There are many authors, researchers and institutions which deal with different levels of these threats. From basic, individual level when the object of attack can be anyone of us, Cyberspace users, to the highest levels of importance that can be recognised on national or global level. As it was already mentioned several times in different world media, the 3rd world war can easily take place in Cyberspace [e.g. Physorg.net News]. To study this serious topic, it is necessary to choose one thematic thread and focus on it. This is not possible within the capacity of this thesis. Nevertheless, before continuation with other sub-discipline I decided to make a very short note about the issue of i-Islam; about the possible threat of one chosen religion in Cyberspace field.

Starting more gently, there can be found many studies interested in the behaviour of Muslims on Internet and changes in their religious neighbourhoods (e.g. el-Nawawy, 2009). The scholars interested in Islam and Muslims usually focus on the analysing how Muslims follow, adhere to and make use of theological advice and fatwas (a religious opinion concerning Islamic law issued by an Islamic scholar) that can be browsed and downloaded from the Internet. For instance, study of Göran Larsson [Larsson, 2005] is interested in the activities and discussions that have been formulated within one chosen Swedish Muslim online discussion group. Another interesting study, written by Smeeta Mishra and Gaby Semaan (Mishra, Semaan, 2010), explores how South Asian Muslims in the United States use the Internet for religious purposes. There were used in-depth interviews in this research, which show that the respondents used the Internet to listen to religious lectures, search for information about prayer times, holidays, traditional food, or correct pronunciation of Arabic words. Anonymity offered by the Internet was recognised as important element that helped the respondents seek Islamic answers to deeply personal questions. However, "it was difficult to definitively conclude whether access to competing interpretations of Islam necessarily led to moderate or extreme lifestyle choices" (Mishra, Semaan, 2010, p. 70).

But there are more serious topics to which attention should be paid. One of them is terrorism and its online form. For instance “Islamic (more technically, salafist-jihadist) terrorists hang out in their online neighbourhoods to transact their „business“. In some cases, notably when propagandising for the masses, seeking recruitism or distributing Web materials, these neighbourhoods tend to be public”. The materials distributed online by these groups differ. There can be found instructions on how to construct weapons and use cell phones to set them off, operational and communications security tips, data on particular people to be used as targets, and online lessons on kidnapping. These web spaces are also used for distribution of money to the places and people who currently need them. It is usually hard to trace any type of these transactions or materials. In other cases, when mooting plots among themselves, Jihadist sites are more private, access is carefully revealed to known individuals (Libicki, 2007, p. 10).

3.8.4 Censorship

Censorship on the Internet has become very important topic since the network and connectivity has spread to those parts of world, where the freedom of word and speech is not fully stabilized. This topic is also one of the daily news of the world news agencies, nowadays dealing with problems and negotiations among Google and China [e.g. CNN.com News]. And it is not only China that is blocking chosen online content. For instance, in Germany, France and Poland, it is illegal to publish material that denies the Holocaust. For this, Google filters search results that do so [CNN.com News].

There is not only published daily news that deal with this issue. Many studies and researchers have the same aim. For instance, there is a study written by Rebeca MacKinnon that was published in peer-reviewed internet journal First Monday [MacKinnon, 2009]. Her study explores one chosen part of Chinese Internet censorship: “how Chinese Internet companies censor user–generated content, usually by deleting it or preventing its publication”. The work was based on a research - systematic testing of Chinese blog service providers. The results showed up that Chinese censorship is very decentralized. The censorship activities differ from company to company. Especially the Chinese blogosphere was successful in showing politically sensitive material. The study concludes that “choices and actions by private individuals and companies can have a significant impact on the overall balance of freedom and control in the Chinese blogosphere” [MacKinnon, 2009].

There are many more papers written about the censorship in China [e.g. Linchuan Qiu, 1999/2000], but it would not be fair to mention only this country. Ronald J. Deibert presents an interesting discussion in his paper about censorship, sovereignty and Cyberspace (Deibert, 2009). He is thinking about the possible impacts of the Internet on state sovereignty, and in particular on states’ ability to control information flows across their boarders. The Internet was historically presented as a borderless world of free-flowing information. Nowadays situations and practices of censorship show something else. The motivations and reasons for these practices differ widely.

It can be talked about the concerns over national security, cultural sensitivities, or protection of social values, to the protection of economic monopolies. The results of such activities are that the Internet, which connects the users to new information, is being experienced in Canada far different than the Internet a user experiences in Iran, China, or Belarus. The aim of this paper is to make an overview of the geopolitics of Internet control. The author is trying to compare the Internet censorship situation within 22 chosen countries (Deibert, 2009).

3.8.5 Mobile Internet phenomenon

My last interest among the rest sub-disciplines of Geography of Cyberspace is dedicated to mobile Internet and Cyberspace that has been created within it. Mobile phones, similar to PCs and Internet, have made dramatic changes to society during the past 25 years. Technologically, beginning of the mobile phones era brought possibility of easier and instant verbal or text communication among individual users. Only last several years and quick technical improvement of mobile phones, origination of smart phones and technical development of mobile networks enabled the users the entrance to Cyberspace via the screens of their "small" mobile phones. Nowadays, it is no more surprisingly to see mobile phone users using their "machines" for other activities than only for calling or texting. Chatting on Fringe, reading online news, checking Facebook profiles or replying on new emails during the long way back home in public transportation? This is the picture of these days.

The invention of mobile Internet caused also the creation of new "type" of Cyberspace, the mobile one. Since now, the main focus of this thesis was on Cyberspace mainly understood as space that is entered via the screens of our computer monitors. Also the majority of books and other papers that are dealing with Cyberspace topic and that I went through for the aims of this thesis are interested in Cyberspace created within the "big" Internet. Despite of the usage of mobile Internet has rapidly increased during the last years, there can be found a very little studies, analysis or thoughts about this phenomenon. Nevertheless, the same questions appeared around Cyberspace of "big" Internet should be asked within the mobile Cyberspace.

Although it was not easy to find any kind of thoughts connected to mobile Internet phenomenon, I was finally successful. Interesting view into this topic is seen in article written by Adriana de Souza e Silva (Souza e Silva, 2006) who is talking about the shift from cyber to hybrid spaces. “Hybrid spaces are mobile spaces, created by the constant movement of users who carry portable devices continuously connected to the Internet, and to other users.” She argues that hybrid spaces arise when virtual communities and cyber worlds move from “traditional” Cyberspace behind the screens of computers to the physical spaces due to the use of mobile technologies as interfaces. “This paper defines hybrid spaces in the light of three major shifts in the interaction between mobile technology and spaces. First, it investigates how the use of mobile technologies as connection interfaces blurs the traditional borders between physical and digital spaces. Second, it argues that the shift from static to mobile interfaces brings social networks

into physical spaces, and finally it explores how urban spaces are re-configured when they become hybrid spaces. For this purpose, hybrid spaces are conceptualized according to three distinct but overlapping trends: hybrid spaces as connected spaces, hybrid spaces as mobile spaces, and hybrid spaces as social spaces" (Souza e Silva, 2006, p. 261).

This short list of sub-disciplines with their introductions shows how rich can Geography of Cyberspace become when one starts to be interested a bit closer. The core part of the thesis presents the most important works, researchers and institutions within Geography of Cyberspace. This chapter shows the reasons why one should consider this discipline, where the particular touch points with current geographical issues are and, last but not least, what is the practical utilisation of Geography of Cyberspace research.

4 Cyberspace and exchange students: a qualitative survey

4.1 Research boundaries

The research part of my thesis is focused on qualitative research of exchange students and their online behaviour. The aim of this research was to show real statements and opinions about Cyberspace from chosen sample of respondents. Research results also answer research questions that have appeared during studying the issues of Geography of Cyberspace and writing the rest of my thesis. I also used the possibility make my research on interesting sample of respondents who were international exchange students coming for exchange studies to University of Ljubljana in Slovenia.

The basic idea of the research was to find out basic type of online behaviour of social studies university students of similar age from different countries from all around the world. I was trying to find similarities and differences in the answers of respondents that would be possibly dependent on their geographical localisation and cultural background.

4.2 Reasons for choice of the method

As it was written above I chose focus group method for the aim of this qualitative research. The reasons why I decided for this method are answered by the main features and functions of this method. Focus group is kind of group discussion between small amount of respondents who are answering several prepared questions. Members of focus group consist of people with similar socio-demographic characteristics. This accurately fitted to the sample which I had opportunity to work with.

Focus group members present their own opinions and experiences, as it happens by in-depth individual interviews, but they also hear answers from other people and are able to reflect on what was said. From this point of view the focus group shows strong social interactions and supports the thinking of respondents as well as brings motivation for deeper answers. Respondents also feel themselves safer because they do not feel the pressure of face to face interview which makes them more open and spontaneous. In comparison with individual interviews it is said that focus groups have more naturalistic appearance for respondents. The whole process was prepared after the fashion of typical focus groups described in studied sources (Richie, Lewis, 2003; Flick, 2006).

4.3 The process of method

I had opportunity to prepare two focus groups with international exchange students. Both focus groups were prepared the same way. The very first step was the preparation of questions and the whole agenda of focus group. Before the focus groups were realised I constructed also

research questions and hypotheses that I wanted to be answered by these sessions.

The next steps were focus groups as such. First and also the second session was started with introduction of focus group, its aims and reasons of the research, as well as with introduction of members of the group. The main part of each focus group consisted of answering prepared questions. Respondents of each session answered four main questions that were added by helping questions. Besides individual answers, discussions and reflections among the members appeared.

The very next steps after focus groups were rewriting the recorded answers and preparation of individual summaries for each question to underline the most important statements that were said by each group. Consequential analysis of the data was made in several steps which lead to final report of the research.

4.4 Hypotheses and research questions

One of the main aim of this qualitative research was to answer questions that were appearing during the preparation phase of the focus groups. These questions helped me with creation of final four main questions that were used during the sessions. Besides the research questions there were constructed also four hypotheses. Their verity is described as one of the last results of the research.

4.4.1 Main research questions

- *Do the social studies students live rich online life?*
- *Do the university students change their identity when coming online?*
- *Do the university students perceive Internet and Cyberspace as another dimension of their lives? Do they feel any threats connected with Cyberspace?*
- *Are there be differences between the respondents because of their countries of origin?*

4.4.2 Hypotheses of the qualitative research

H1 International exchange students are very active users of the Internet and Cyberspace. It is even possible to name them “geeks”.

H2 There are visible differences in usage among the respondents that is caused by the different country of origin.

H3 Because the respondents are university students, mostly studying any kind of social sciences, they are not changing their identities on the Internet.

H4 Respondents mostly use the Interent for study purposes, for getting news and information and as communication tool with their friends and relatives.

4.5 Qualitative data analysis

Data analysis in qualitative research is not clear and exactly given as it is in quantitative research. The process I chose for proper analysis of my gathered data consists of three basic steps.

First of all I chose the approach of analysis that showed me the way how to read the data and how to interpret the results. For the aims of my research I chose so called “narrative analysis” which identifies the basic story which is being told (Richie, Lewis, 2003). Focus group data were analysed as well by using so called “whole group analysis” which look at the data produced by a group as a whole without delineating individual contributions (Richie, Lewis, 2003). While interpreting the analysis I chose so called “self-understanding” and “critical common sense understanding” approaches (Richie, Lewis, 2003). The first approach says how to formulate and interpret shortly what the participants themselves meant and understood. The second one says how to use general knowledge about the statements that have been said to place them in a wider area.

Second step was the reduction of data to appropriate amount because gathered qualitative data are usually voluminous, messy, unwieldy and discursive. Data reduction is a central task in qualitative analysis but one which is achieved in a number of different ways. During the reduction I tried to pair down similar answers and statements together and make from them general opinions and core meanings that crossed the whole group of respondents.

Last step was the data analysis itself. Its results are described in next chapter in detail.

4.6 Results

Before the introduction of the final results it is necessary to say that both focus groups passed successfully and I was able to get answers on all questions I prepared for respondents. Respondents easily understood the questions and tried to deeply answer all of them. If they were not able to answer in general way they likely used any kind of example from their previous experiences.

Respondents of both focus groups consisted of similar university students who attended the course of Cybersubcultures that is highly connected with topic of Geography of Cyberspace. All of them were exchange students who came for exchange program to University of Ljubljana, to Faculty of Social Sciences. All of them were students of different kinds of social science on their home universities, e.g. students of sociology, political science, public relations, human resources, European studies, media studies. All of the members of groups were around 20 – 25 years old while focus groups offered good gender mixture. The only main difference that was desired was the difference in their nationalities. Respondents were from countries all around the world including Portugal, Spain, Germany, Belgium, Austria, Czechia, Finland, Serbia, Poland, Canada, Hungary, Romania, Turkey etc.

The questions that were used on both sessions had this wording:

- **Question 1 – Your online movements**

In this part we discussed about online movements of respondents – in past and nowadays. Respondents were asked to think about the Internet as another space where they do their daily activities, where they spend their time, where they meet their friends. They were asked to think how their Internet behaviour has changed in time.

- **Question 2 – Internet, another place/space to live – freedom or threats?**

Respondents were asked to think about Internet as another dimension of their lives. Most important issue was for them to think about their own cultural characteristics, social background and rules of their society that are given and how these aspects influence their online behaviour. They were asked if Internet is another space that has no boarders and that negates typical cultural characteristics. They were asked also to think about people they are meeting online – if their behaviour is different than in their real lives?

- **Question 3 - Internet in the future**

Respondents were asked to think about Internet in 20 years, in the future and say their opinion about how it will look like. They were asked what they miss nowadays online.

- **Question 4 - Geography of Cyberspace**

Respondents were simply asked on their opinion about Geography of Cyberspace. What they understand under this term and what would be their definition of this discipline.

First two questions were the most important of the whole session. In general respondents were commenting their online behaviour and habits. Most of them agreed with the statement that they use Internet as practical tool for several activities. Because of their staying abroad on exchange studies they were more in touch with their friends and relatives from their countries which means the time they spent online for this reason was higher than it would have been when they had been in their country. The highly popular words that were repeated many times were “social networks” and “Facebook” that is currently one of the most important spaces for their online socialising.

“I spend more time online here in Ljubljana cause I need to stay in touch with my friends and relatives from my country.”

Besides this they spend a lot of time online also for their studying aims, especially in the time of exam period. Most of respondents agreed that they got used to doing also another practical activities online, such as taking care about their money account, reading news or watching online broadcasting.

“I am spending more time online cause there are more and more information on the Internet.”

They agreed that their online habits and needs changed in time. This was caused by changes of WWW as such but also due to changes of themselves (growing up, getting older etc.).

“Few years ago I used Internet just for playing around...”

Even they stopped doing some daily “real world” activities and started to use this saved time for online activities they did not stop to perceive the importance of their real lives besides the online life. No one from respondents felt and perceived Cyberspace as kind of a new dimension of their lives. The whole group, in both cases, was quite convinced of the claim that the most of the users and “people” using Internet do perceive both dimensions as different and that it is not possible to mix or compare them together.

“There is still real life and cyber life!“

“I do not do less activities cause of Internet. Maybe I watch less TV but I still see and meet my friends the same amount of time as before...”

The question of changed online identity was answered with very similar statements. None from both groups is living online life different than a real life. It was easy to feel common agreement with opinion that there is no need for identity change on the Internet. at least among the respondents. On the other hand there were respondents who know from their surroundings users (friends) who behave different when appearing online. Not even these friends change their identity their online behaviour is more open, friendly and talkative than in their real lives.

“Nobody is changing his or her identity online...”

“I am the same person in real and online life...”

On the contrary respondents felt the advantage that Internet has no boarders and it is easy to say freely their opinion to the masses. Some of them were active and writing their own blogs with political or other content. Although there were people from countries where the possibility of open public opinion is not so explicit there were not registered any problems with online expressing under real identity.

“Internet gives you freedom to tell your opinion.”

In case of online threats surprisingly there was almost nobody frightened from some real threats. Even most of them were able to think about any kind of online danger that they experienced within their surroundings there was not clear feeling of jeopardising when respondents were talking directly about themselves. Their comments touched topics as collecting of private data by enterprises, personal privacy on Facebook or online provocation by other users. The common opinion that crossed both groups was that “we” care enough about “our” online safety and privacy. Respondents were calm while talking about their online profiles and Cyberspace steps they already did. Only few of them were discussing over the topic that some of the users are easily able to show and tell their personal information on the web pages even they would not be able to say the same information when asked in their real lives. No one of respondents was able to express and name the real possible danger that is hidden behind using different online services and applications.

“Why just people easily write on the Internet that they are Catholic but they are not able to say this in their real life on loud?”

“The threat is e.g. when enterprises collect your data but you can do much about it, you should not be so much worried...”

“I am worried about getting a new job... I think I will have to delete my Facebook profile.”

When the question turned on the topic of Internet future there were not many opinions and ideas about how should or will Internet work in several years. This showed the fact that respondents are sort of users who do not think much about development of the Internet and who usually only use web services that are currently in fashion or which they currently need. Respondents were not able to answer on question what kind of services or web pages they miss on Internet nowadays. Some of them were talking about collapse of Internet in couple of years even they were not able to define the word “collapse” properly. Huge discussion was about the future of online newspapers and magazines and whether the users will be forced to pay for any kind of information. In general, respondents took the fact of paying for news as a matter of course whereas some of them got already used to pay for it.

“I think Internet cannot collapse, maybe some services yes, but not Internet as such...”

“Several years ago we were excited to get an email... Today it is almost disturbing for us to get an email, we are getting lots of emails nowadays...”

“Facebook will be always there...”

The end of both sessions was dedicated to discussion over the topic of Geography of Cyberspace. This question was kind of border topic but very important for my needs. I wanted to get an idea about what respondents understand under the term of this discipline. There was not clear idea about what kind of research field it is. Most of respondents were not able to take over the ideas of traditional geography (defined by boarders, lines, visible spaces etc.) to the dimension of Cyberspace. Although the question turned to the topic of Cyberspace mapping respondents were not very sure what kind of maps could be created for the needs of Cyberspace.

“Internet is negating boarders. I can be in touch with people who are not in geographically close area...”

“Why should geography care about Cyberspace? There are other social sciences that take care about the Cyberspace so why do we need geography for this as well?”

“You cannot map online content, its not possible...”

4.7 Strengths and weaknesses of research

After the sessions and summing up the results of the research several strengths and weaknesses of using focus group method as such and of its application on the aims of this research were recognised. I decided to mention these points in my thesis because these can be helpful in the future researches as well. The other reason is the necessity to know these strengths and weaknesses for proper understanding of the results of this research.

Starting with strengths, there could be recognised the typical strong sites of focus group. During the sessions respondents were often reacting and reflecting the answers and opinions of the other group members. This motivated the whole group for better and sometimes deeper answers. This kind of reflection can be considered as more effective than any kind of helping questions that I added. The other recognised strength was the positive effect of group session which helped some of the respondents to answer the questions easier and without the feeling of pressure that could be effected by individual interview.

On the other hand, use of focus group method showed as well some weaknesses. During the sessions I recognised mainly two problems. First of all, both groups were divided into kind of dominant and passive respondents. Dominant respondents likely answered on all questions and were always prepared to discuss about said opinion. There was no need to motivate these respondents to answer which was a difficulty for passive respondents. This kind of unbalance can be solved only by good facilitating skills of moderator. The second problem of group sessions is that some of respondents do likely repeat the answers of the other members without any additional intention of defining their own opinions. This fact was recognised especially by passive members who preferred to use the answers of the others as their own. I tried to minimize this effect by forcing these kind of respondents into their own deeper answers using other additional questions during their answering.

4.8 Proof or disproof of hypotheses

Hypotheses that were created before the realisation of sessions were partly proofed. Nevertheless my overall assumptions before the sessions were more optimistic in accordance with the time respondents usually spend online and the amount of services and WebPages they are used to use. I was expecting deeper consciousness about life online, identity changes, as well as about possible online threats.

H1 International exchange students are very active users of Internet and Cyberspace. It is even possible to name them "geeks".

This hypothesis was not approved. International students of social sciences are not very active users of the Internet and they use it mainly for practical and communication reasons. They usually spend online only several hour per day, mostly around 2-3 hours which is far from calling them geeks. They prefer still real life connections and meeting their friends in reality than just online.

H2 There will be visible differences in usage among the respondents that will be caused by the different country of origin.

This hypothesis was not approved. Although the students were from different countries of origin,

their online habits and behaviour were very similar. They are used to use similar services and web pages. This finding underlines the fact that Cyberspace negates some of the typical geographical signs and regularities.

H3 Because the respondents are university students, mostly studying any kind of social sciences, they will not be changing their identities on the Internet.

This hypothesis was approved. None of respondents is changing her or his identity while being online. They do not feel any need for different life online and prefer to show their real identity on the Internet, especially as members of different social networks.

H4 Respondents will mostly use the Internet for study purposes, for getting news and information and as communication tool with their friends and relatives.

This hypothesis was approved. All respondents are used to use Internet especially for practical aims. Their needs and usage depends usually on what they currently need to solve. Internet as communication tool has very important role especially during their exchange studies. It enables them to stay in touch with their relatives, friends, country of origin.

4.9 Summary

The objective of qualitative research used for the aims of this thesis was to understand the thinking of university students who are focusing on different kinds of social sciences. Group interviews that were organised into two independent sessions showed what kind of Internet behaviour and perception of Internet this sample of respondents has. Because the topic of the thesis is strongly connected to Cyberspace and its importance in current era, realised qualitative research tried to uncover whether respondents are used to use the Internet as another dimension of their lives.

Recognised results advert to the fact that chosen respondents are kind of “basic” or “typical” users of the Internet. This kind of users are not heavy users of Internet spending majority of their every day lives online and trying to discover number of new web pages and services. This kind of users is typical by using similar web pages every time while being online (e.g. email, social network, online news). They do not demonstrate very high interest about online life and possibility of identity changing. Respondents take Internet as a practical tool for their current online needs but not as a new dimension of their lives, as kind of “second life” platform. There was nobody who is changing his identity into artificial virtual identity, even for needs of political blogging etc. None of the respondents mentioned that his or her real life is directly connected and often dependent on the cyber one.

Speaking about online threats, respondents were not seriously scared about possible online threats that are hidden behind many online services. They generally think that they do enough for their online safety and protection of their personal data shared online. Although they were able to name several examples of online dangers as an experience from their surrounding this fact did not change their minds about being more careful.

Thinking about the future of the Internet, respondents did not name any specific needs that they miss in Cyberspace nowadays. Their usage and needs on the Internet mostly depend on what kinds of new services have been created and are currently “in”. The only more discussed topic with final common acceptance in both groups was paying for online news and quality information in close future.

Very interesting part for me was asking the respondents about their opinions on Geography of Cyberspace. In general, members of groups were not able to define and clearly explain what this research field is about. There was recognised still traditional perception of geography as such. This fact is a good challenge for me and other geographers who are focusing on this topic to try to change this traditional way of thinking.

Realisation of focus groups as one of the qualitative research method was interesting and highly interactive experience for me. I learnt new skills and details about how to conduct a qualitative research. In this case, focus group method approved as a quickly and applicable way how to understand and answer research questions during the research itself. Focus group method fully satisfied the aims of my research and thesis.

5 Conclusion

Cyberspace - phenomenon that has entered our lives without human beings' perception that “something is going on”. Internet, the technological playground where Cyberspace was created and grown up, is one of further steps of technological evolution of this World. Similar to the invention of trains, telegraphs, telephones, mobile phones etc., the Internet is also another tool that should help human beings to cross wide distances easier, communicate more effectively, make everything quicker and cheaper. Besides all these similar characteristics, the invention of Internet has enabled the origination of a brand new space – Cyberspace. Space that has totally changed the meaning of time and place. Space that has become a new “stage” for human beings' performances. Space that should be researched by geographers as another spatial dimension.

The aim of this thesis is to explain Cyberspace within boarders of geographical thinking and closely present a new discipline of social geography – Geography of Cyberspace. Although many papers were written about different impacts of Cyberspace among Czech scholars and students, a basic introduction and explanation of the discipline as such is still missing. I am confident that without proper introduction and understanding of any discipline it would not ever be effective to work and research another sub-topics and issues. For this reason, the thesis presents a wide compilation of different data and information that, put together, creates compact picture about Geography of Cyberspace.

The discipline is introduced by the definition of Cyberspace and brief history of Cyberspace origination and next periods of its evolution. This shows technological background of this invention and the main reasons why Cyberspace was created. It should be said that the very first thoughts of the first network projects did not expect such growth, popularisation, commercialisation and finally, such a dependence of our everyday activities on current Cyberspace.

The effort to explain the theoretical framework of this discipline and its cognition within the most significant social-geographical theories can be considered as successful. Visible bindings can be seen with the geographical approaches after the 2nd World War, especially approaches after the Quantitative revolution in geography. Behavioural geography and Hägerstrand's “time geography” are the closest disciplines and it can be said that they supplement each other. In any case, geography is a spatial science. For this reasons, there is a deep discussion about whether Cyberspace is destroying the classical meaning and perception of spatial characteristics or whether it has created new ones. This discussion has additionally been exposed within the thesis by bringing different point of views so that the reader has a possibility to create his own opinion.

The core of the thesis consists from the retrieval of chosen writings that form the base of the discipline. List of nine books that were read in detail uncover different aspects of Geography of Cyberspace. When the retrievals were written, the books had to be evaluated and divided into several groups of importance. The key aspect of this division was the level of focus and interest in geographical point of view, in Geography of Cyberspace within given book. I was also searching for

a selection of books that would cover different sub-topics of Geography of Cyberspace so that the scholar can get compact information. For these reasons, four books were finally identified which should be read by any social geographer who decides to deal with Cyberspace issue. This quaternary consists from Martin Dodge's and Robert Kitchin's book "*Mapping Cyberspace*", William J. Mitchell's visionary writing "*City of Bits: Space, Place, and the Infobahn*", Matthew Zook's "T*he Geography of the Internet Industry*" and Stephen Graham's and Simon Marvin's "*Telecommunication and the City: Electronic Spaces, Urban Places*". Basically, all books are commenting the shifts of world and society with the presence of Cyberspace, Internet, and networks. As Castells argues, classical perception of geographical space as space of places has moved into the space of flows (Castells, 1996). Current society can be named as a network society where all of us are becoming Cyborgs, persons dependent on different tools that are connecting us with Cyberspace (Mitchell, 1995). With the commercialisation of the Internet and Cyberspace, new industry has been created -the Internet industry which nowadays feeds the most valuable and successful enterprises (Zook, 2005). The great impact of Cyberspace can be seen within the urban areas. Bitspheres, soft cities – this is the reality of nowadays. The life within the cities is more and more dependent on different Cyberspace technologies. Restructuring and transformation can be seen within many attributes, e.g. employment and labour, transportation, architecture of buildings, flows of trade etc.

Besides these four most important books, the rest of the works also deal with similar or other aspects of Cyberspace. There can be found very first statements and theoretical approaches to this issue, as well as a detail history of the Internet invention with wide contemporary context. Although all the authors consider Cyberspace and coherent technologies as important actors of current world shifts, they all agree that geography does and will still matter (Dodge, Kitchin, 1999). The fact that human beings will always need "real" world components is for all authors unarguable.

The attention is paid also to the most important researchers and institutions within the field. Selected universities and other institutes from the United Kingdom and the USA were recognised as the hot spots of the discipline. This is obviously quite "heritage" to the origination of the net which first appearances were in the USA and lately in the United Kingdom. Similar observation was done among the Czech boarders and geographers. As it demonstrated, at the moment, there is no stable research, department, or institute which directly studies Geography of Cyberspace. Nevertheless, the interest about Cyberspace is huge among Czech scholars but mainly within the fields such as sociology, psychology, information technologies, Cyberspace security. Unfortunately, geographic departments are still missing on this list. For this, one of the aims of the thesis is to become an inspiration and basement for stable geographical research. The reasons why to study and to pay attention to Geography of Cyberspace are described also within the chapter which is introducing its various sub-disciplines. There can be seen the practical utilisation of Cyberspace research and the urgent need of its establishment within social geography.

The thesis is supplemented with a qualitative research which is aimed on online behaviour of exchange students who study different social sciences in different parts of the world. The method used for the aims of this research was focus group, one of the most efficient methods of qualitative research. The respondents were during two sessions asked on four basic questions about their online behaviour, online habits, identity, their perception of Cyberspace as a new dimension of their lives, as well as their opinions about the future of the Internet and ideas about Geography of Cyberspace.

Four hypotheses were proposed in which two of them were approved and two of them were not. My expectation was that the international students were very active users of the Internet and Cyberspace. This was not approved as findings illustrated that the majority of respondents used the Internet for highly practical needs and did not spend online more time that it was necessary. From the geographical point of view, I was expecting that the respondents would embody differences in Internet usage because of their different countries of origin. I was expecting that different background, development level of their countries, cultural differences, different laws and social rules would cause visible differences among their Internet usage. This hypothesis was not approved as well as their usage and habits were very similar. My next expectation was connected to the topic of identity changing when I thought that the respondents would not be changing their identities. This hypothesis was approved. University students of different social sciences do not show a need for identity changing when they come online. The last expectation was about the practical utilisation of the Internet. I assumed that the respondents would mostly use the Internet for study purposes, for getting news and information and as communication tool with their friends and relatives. This hypothesis was fully approved.

From my point of view, significant finding within this research was that the respondents do not perceive Cyberspace and Internet as something that has a great influence on their lives. Most of the members of focus groups perceive Cyberspace as something that stands apart from their real lives. This is the typical sign of Cyberspace – people usually do not perceive and feel the strength of it within their everyday lives. But this is contrary to the case. The dependence and bindings of our real lives with Cyberspace are significant and strong even we do not consider them as such.

The work on this thesis was kind of amazing adventure. I learnt a lot of new aspects and views about Cyberspace. Although I have been working within this field (mainly, on commercial based projects) for several years before writing this paper, there were many uncovered issues that I did not think about before I started to write this thesis. Books and articles I had chance to read showed me many new points of view and interest that made me especially believe that Geography of Cyberspace is a full-value discipline which deserves its attention. For this, I hope that not only my next academic and research steps will uncover and discover this topic in deeper sense.

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