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FACULTY OF SOCIAL SCIENCES

Institute of International Studies

Department of Russian and East European Studies

M. A. Dissertation

2012 **Philip Connelly**

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The Lisbon Strategy and Europe 2020: Where is the information society?

M. A. Dissertation

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ABSTRAKT

Mezi lety 2005-2010 lze napříč společností v České republice zaznamenat nárůst v používání počítačů a Internetu. V souladu s tím, co předpokládala literatura, mladší generace - zvláště tak zvaná Generace Z, prokazovaly výrazně vyšší úroveň počítačové gramotnosti oproti starším generacím. Míra počítačové gramotnosti je nejvyšší u lidí s nejvyšším vzděláním a u domácností s dětmi. Vládní politiky na podporu počítačové gramotnosti měly pozitivní účinky, přesto však pouze částečný úspěch. Všichni školáci mají přístup k počítačům a Internetu, nicméně žádná z těchto politik nevedla k účinnému zvýšení počítačové gramotnosti mezi dospělou populace. Výsledkem této neuspokojivé politiky je, že Česká republika, obdobně jako řada ostatních evropských států, nedostála výzvám Lisabonské strategie a pravděpodobně neuspěje ani v naplnění cílů strategie Evropa 2020.

ABSTRACT

In the period 2005-2010 the Czech Republic has exhibited a growth in computer and Internet usage across society. As is to be expected from the literature, younger generations, especially what has been termed Generation Z, show significantly higher levels of computer literacy than older generations. Computer literacy is also at the highest level among the most highly educated and among households with children. Government policies to increase computer literacy have had positive effects, however they have only been a partial success. All schoolchildren have access to computers and the Internet, however there have been no effective policies for increasing computer literacy among the adult population. The result of this lack of policy is that the Czech Republic, in a position common to much of Europe, failed to meet the challenges of the Lisbon Strategy and will likely fail to meet the targets of Europe 2020.

KLÍČOVÁ SLOVA

počítačová gramotnost, Česká republika, Lisabonská strategie, statistický přehled, digitální domorodec, Generace Z

KEYWORDS

computer literacy, Czech Republic, Lisbon Strategy, statistical review, digital native, Generation Z

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Prague, 18 May 2012 Philip Connelly

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

The information society has become a *cause célèbre* for modern politicians. The desire to create, or to prepare for, a major change in society has become seemingly ubiquitous. However, many in academia have seriously questioned what exactly one could expect from an information society, what exactly the term refers to and how we should understand it when used by different people. The problem is that the term is essentially undefined, unexplained and used differently by different people. It is a word without coherent meaning. Despite this lack of meaning the European Union still uses it as a target for social policies.

This analysis attempts to understand the term as it used by the EU, to determine what exactly is meant and how we determine whether or not policies created by the EU have promoted the information society.

The way that shall be done is by taking an analysis of data from three datasets published by:

- the Czech Statistical Office, ***Č****eský* ***S****tatistický* ***Ú****řad (henceforth ČSÚ)*.
- the Ministry of Informatics *(henceforth MI)*.
- the World Internet Project *(henceforth WIP)*.

Each of these sources provide data for Internet use, or ICT use more generally, by which it will be attempted to determine how effective policies have been to create the situation laid out in the guidelines of the Lisbon Strategy.

The Lisbon Strategy will be used as a template against which it can be determined what is proposed to be the necessary situation to create an information society and whether one can write a series of statements as a hypothesis against which to test the theory.

Having determined how effective policies have been to achieve the goals of the Lisbon Strategy, there will be a prediction of whether the Czech Republic is prepared to meet the targets of the Europe 2020 strategy.

1. THE INFORMATION SOCIETY, THE EU AND THE LISBON STRATEGY

At the end of 2010 it was clear to all that the Lisbon Strategy had failed in its stated goal. Europe had failed 'to become the most competitive and dynamic knowledge-based economy in the world', as the events involved in the financial crises which began in 2007 show, Europe was not 'capable of sustainable economic growth' and could not provide 'more and better jobs', the stated goals in the *Presidency Conclusions of the Council of Lisbon* (European Union, 2000).

Few would have expected that the Lisbon Strategy would be such a failure – few of the targets were met, by any of the member states. Only two member states met the 3% of GDP target for spending on research and development, the EU as a whole averaged 1.84% (Charlemagne, 2010).

In the light of such a terrible failure it is necessary to identify the reasons for failure and to determine how well placed each territory within the EU is for the Europe 2020 Strategy, that which replaced a series of strategies (including the Lisbon Strategy) at the end of 2010 (European Council, 2010). The following review will show what progress *has* been made and where the Czech Republic stood at the end of 2010 to meet the targets for an information society laid out in the Europe 2020 strategy.

The aims of the review are to allow for a clear and concise review of computer literacy among the population; determine which individuals in the Czech population are most computer literate and which are least computer literate, thereby showing which sections of the population the government needs to address in order to meet the ambitious targets of the Europe 2020 strategy.

2. UNDERSTANDING THE INFORMATION SOCIETY

One of the core aspects established in the Lisbon Strategy guidelines was the need to prepare for the information society[1]. The concept of the knowledge industry has been used in academia since the 1960s when Fritz Machlup discussed *The Production and Distribution of Knowledge in the United States* (1962).

Since then it has been discussed by a series of authors that the model of an economy based on knowledge, rather than goods, has increasingly become a reality in recent decades (Drucker, 1969; Touraine, 1988; Schiller, 2000) with a number of theorists suggesting both how this change is taking place, what effects the economic revolution will have and how to build a stable economic model around knowledge (Castells, 2000 [1996]; Duff, 2000, Webster, 2005 [1995]). What all the theorists have made clear is that in the past few decades Information has had a greater role in the economy of the developed world than at any point since the industrial revolution, that increasingly education and knowledge are more highly prized commodities than material commodities, therefore stimulating both higher growth and a wider variety of growth – which should ensure greater stability in periods of economic crisis.

The key to an information society is the movement of information, not materials or – nowadays – people. With digital technologies, research and development can take place anywhere due to the communicative possibilities of the Internet and digital communication technologies, generally. This may raise issues in the case of intellectual property rights but, as has been reported in the media, there is a very high demand for information, as the cost for

[1] Also called a knowledge society; the two terms appear to be used in mutual synonymy. The term information economy is also commonly used without a clear difference in use. In this text the terms will be discussed, however it should recognised that, as with their use by academics and within policy publications alike, the terms are understood to be synonymous.

research and development is significantly reduced – saving companies significant outlays of money (BBC NEWS, 2011).

It has been theorised by many academics that for a state to construct an information economy the first and most important task is to ensure the population is computer literate, that they use computers and the Internet on a regular basis (Webster, 2005 [1995]). This should allow potential employers to be confident that employees would be able to quickly adapt to using specific ICTs in the workplace.

However, much of the theorising on the subject of the information society and economy has been seriously questioned. There have been criticisms of academics using the terms in a way which lacks transparency (of which the clearest voice is that of Frank Webster) which led them to making some attempt to discover exactly what different academics really mean in relation to the term (Webster, *Theories of the Information Society*, 2005 [1995]). Others have questioned implied assumptions, such as the importance of ICTs to an information society (Darnton, 2000). For the common person, it has been argued, the term is unclear and relies more upon the interpretation of the audience than should be acceptable in academic use, or policy guidance.

2.1. The information economy or the information society?

The terms "information society" and "information economy" have become part of the standard milieu within EU politics, it has become the goal of some European politicians to promote clear and positive progression towards a society which is 'the most competitive and

dynamic knowledge-based economy in the world' (European Union, 2000). The Lisbon Strategy was aimed primarily to enable:

> *…the transition to a knowledge-based economy and society by better policies for the information society and R&D, as well as by stepping up the process of structural reform for competitiveness and innovation and by completing the internal market...*
>
> (European Union, 2000: section 5)

Included within the Lisbon Strategy was a tentative explanation of the shift from the current society to a future "information society":

> *The shift to a digital, knowledge-based economy, prompted by new goods and services, will be a powerful engine for growth, competitiveness and jobs. In addition, it will be capable of improving citizens' quality of life and the environment. To make the most of this opportunity, the Council and the Commission are invited to draw up a comprehensive eEurope Action Plan to be presented to the European Council in June this year, using an open method of coordination based on the benchmarking of national initiatives, combined with -the Commission's recent eEurope initiative as well as its communication "Strategies for jobs in the Information Society".*
>
> (European Union, 2000: section 5)

Additionally, the outline of the strategy included a statement, noting the specific intention to '[Realise] Europe's full e-potential…creating the conditions for electronic commerce and the Internet to flourish, so that the Union can catch up with its competitors by hooking up many more businesses and homes to the Internet via fast connections' (section 10).

Clearly, no one could say from these statements what the concept of "information society" constitutes, or even how it differs in a concrete way from an "information economy". Generally the terms are used in a way that they are interchangeable or directly linked; one cannot exist in the absence of the other. This is not simply a feature of politicking or a

particular lack of clarity unique to European politicians, as Frank Webster comments, 'most of the conceptions of an "information society" are of limited use to social scientists, and still less to the wider public's understanding' (Webster 2006 [2002], 443). Some among the numbers of politicians and academics have become enthralled with a term which has a different meaning for different individuals and for most plays a no more salient role than to describe one's individual apprehension concerning the much greater role of ICTs in modern life (ibid.). Clearly, the term needs to be understood in a better way, or the term should be retired in favour of another which can better hold up to academic scrutiny.

It is not an uncommon thing for guidelines, such as those included in the *Presidency Conclusions* at the Lisbon European Council's special meeting which established the goals of the Lisbon Strategy, to be broad and chiefly aimed at providing a vision – rather than to provide clear, hard figures or statistics by which to measure the success or failure of said strategy. In this respect it is because using purely quantitative measures to describe a social phenomenon seems to lack coherence for the general public (Rozsak, 1986); establishing a clear change at which point a society alters from having one structure to another can cause difficulties when one solely takes information in the form of pure, factual points of data. However, using qualitative language alone means that it is impossible to even use a scientific method. Marrying the qualitative and quantitative methods when the concept itself is subject to individual subjectivity is the goal; to produce scientific results with an awareness of the opinions of those examining the society, without some of the inherent bias.

The problems with establishing what constitutes a clear change in the nature of society on a global scale are considerably difficult, not least when the terms "information society" and

"information economy" are bandied about, lacking a single cohesive definition, or a range of definitions, which have been commonly agreed upon. Not only is it unclear what should be measured by social scientists, but it is unclear what to expect in even the broadest terms for the general public.

The most comprehensive attempt at defining the terms was Frank Webster's *Theories of the Information Society* (Webster, 2005 [1995]), which attempted to better understand the origins, future and use of the term "information society" and how it could be understood. The first thing that Webster has to say on the academic use of the term is that 'so many writers operate with undeveloped definitions…they blithely presume it is not necessary to clarify precisely what they mean by the concept' (Webster, 2005 [1995]: 8); in the vacuum of a definition, the term lacks the clarity which is required of academic rigour.

Webster established that, in the main, understandings of an "information society" come generally under five basic concepts (all or only some of which may be present within any individual's understanding of the term) which are core to how information society is understood in the majority of scholarly work.

1. *Technological innovation and diffusion*

New technologies are an excellent measure of change and often are the prime example that the nature of society itself is changing by virtue of differing practises. The spread of personal computers and portable computers has meant that society itself has undergone significant changes. Often this easily recognised observation is taken as reason to presume that society itself is changing in certain core respects. 'The

suggestion is…that such a volume of technological innovations must lead to a reconstitution of the social world because its impact is so profound' (Webster, 2005 [1995]: 444). This futurist, technological-determinist view has a greater level of traction because of the way technology acts – those who do not have good levels of computer literacy are restricted to the world of computers. It is not a great leap to say that as computers become more widespread one could argue that society must be changing as the computer illiterate cannot communicate with an ever-larger proportion of society via technology.

The clearest flaw in this argument is that it does not explain *how* this change happens, nor does it account for people doing the same thing with technology as without, albeit via a different medium (Webster, 2006 [2002]). Also, referring specifically to information society, some scholars have written convincingly that the core aspects of what a society is may change at times of high or low rates of technological change. Robert Darnton, for example, argued that 18th Century Paris may have been an early information society without any of the ICTs that are normally associated with the term (2000).

2. Occupational change

This concept almost flows directly from the pen of Daniel Bell (*The Coming of the Post-industrial Society: A Venture in Social Forecasting* ,1973) as far as Webster is concerned.

As Bell is one of the more well-known American theorists, his theories had a good deal of traction in the post-war era. His argument was that the post-industrial society would be structurally different to industrial society due to the intricacies of it

becoming increasingly information-centric, rather than commodity-centric and that the service sector would become dominant, rather than the industrial sector. In his vision, information would have the greatest value in the economy and therefore, ICT literate individuals would be the most valuable. This would take place due to a shift from now-traditional bricks-and-mortar industries to footloose industries, such as financial services and technology services, in particular research and development. His vision was one of powerful technical elites (consider the "Alpha Geek" principle).

Bell established that the population of workers in certain fields have shown a trend towards those with more "information work". The logic states that by valuing information work more greatly, the focus of society must be changing, as the day-to-day activities of people change, towards a society based more around the importance of information. A series of scholars (Leadbetter, 1999; Reich, 1992; Drucker, 1969; Castells, 2000 (2nd ed.)) have suggested that the economy now is dominated by the ability to manipulate information. That such activities, when promoted, would give speed to the transition to an information economy – and therefore promote the information society. As such, this is the approach most commonly assumed by political strategies, in addition to the promotion of ICTs generally.

3. Economic value

This is closely tied to occupational change but, it follows a more economical way of understanding society. It has been argued that when there is a majority of economic activity in information-related activity, rather than other types of business, then it must follow that there must be an information society to speak of (Jonscher, 1999).

The problems with this are two-fold: firstly, it is difficult to even establish exactly what *is* and what is *not an information-related activity*. The requirement to compare one point in time to the next requires an objective measure of which is which and some sort of allocation of time in each may be necessary in the case of some employees. The second problem follows that there will be a single liminal point at which information based activity produces more GDP than any other activity. This is a coherent point at which something which was not truly in existence comes into existence for discussion, analysis and understanding. However, societies are not prone to changing so drastically and so quickly in most everyday situations. As such, it could be argued to oversimplify the process by which an information society could come into existence.

4. Information flows

Spatial understandings of information flow is based in the cognitive importance of space and the spatial awareness one receives from networks and information flow which is inherently different to non-informational transactions. It could be understood that modern technology has allowed communication of information in a previously impossible manner and that provides the forces required to bring about a different type of social structure.

5. Cultural change

This is the most easily recognisable, but also the most difficult to study over time as it is a purely qualitative subject matter. ‘Contemporary culture is manifestly more heavily information-laden than any of its predecessors’ (Webster, 2006 [2002]: 449) and this information is increasingly social – social networks and miniblogging

> websites have allowed individuals a significantly greater series of inputs from other individuals. We are bombarded with more information than ever before, with omnipresent advertising, junk mail, unsolicited emails and almost universal access to the Internet. The role that these changes play in our social understanding of the world is very likely to make a difference to individuals.
>
> However, whilst it may be readily understood by many, this type of understanding of social change is the hardest to determine. It is the most subjective and qualitative. Symbols cannot be measured easily using statistics and the fluidity of the concept of change is extremely subjective. This concept of the "information society" is perhaps the closest single image to how most people understand the changes they witness in society, but the subjectivity that is inherent in each of their understandings of that change is what is ultimately most responsible for the fluidity of the term "information society" itself.

The largest problem lies in the lack of clear academic analysis of the core concepts behind the information society. For Webster, the most basic precepts remain, for many, unexamined – not least of which is the term "information" itself. Theodore Roszak (1986) rejected a quantitatively purist approach to information, arguing that the difference between having more information and being better-informed was not only extant but relevant to society; for Roszak having more raw bits of data available to an individual has no real effect upon society. Instead, what matters is what content the information has and how individuals are using and creating information. He established that it is important to examine the very nature of information prior to use of the term; a position which should be readily agreeable to all who wish to write on the subject.

Webster's discomfort in the term arises from 'a range of thinkers [who] have conceived [information] in the classic terms of Claude Shannon and Warren Weaver's (1949) information theory' (Webster, Theories of the Information Society 2005 [1995]). This definition understands information not as a thing which requires context or interpretation; instead it is a basic unit, a 'thing', to be defined by its format rather than its content, like light or sound. In the words of Stonier:

> **Information exists**. *It does not need to be* **perceived** *to exist. It does not need to be* **understood** *to exist. It requires no intelligence to interpret it. It does not have to have* **meaning** *to exist. It exists.*
>
> (Stonier, 1990:21), original emphasis

This of course raises the question, if "information" simply exists, as do energy and matter, there must be a scientific basis for determining what information is in the same way as there are established methods of defining energy and matter. In the case of information, the only similarity is the presence of a basic unit of measurement: the bit – a simply binary – on/off, yes/no, 0/1 (Webster, 2006:26), but what remains impossible is how to establish what information is. Clearly any binary must exist in relation to another established concept: life/death, light/dark, North/South. Whilst each of these concepts does have a scientific definition (for example, dark is the absence of light and light is the presence of light), the "question" which the information is the "answer" to (such as: is it dark or light?) must be asked before the answer can exist. Clearly, establishing information as a thing is not only impossible, but it is "pure nonsense" (*ibid.*). The information about whether a predefined space is light or dark requires first that the concepts of: the definition of the space, of the interest in the question and the factors upon which an answer are reliant, are already present.

That this nonsensical definition of information has been judged to be the basis for technological understandings of an "information society" have become so widespread (Webster, 2005), clearly shows that even a basic level of scrutiny and rigour on the part of academics has been lacking. Despite this, a technological understanding of information society has been established as the basis behind the method for putting about the shift from an industrial society to an information society in the political consciousness. The approach appears to be, "the more people use computers and have access to information the better, as this will establish an information economy". Clearly, considering that the theoretical basis behind such an approach is subject to serious debate within academia, one should take such an approach under more serious consideration.

It is the stated position of Frank Webster that the term "information society" has lost any connection to a clear denotation, for the social scientist it is not a salient term to be used, primary among its problems is the issue of the connotations the term may bear. As a term with such a variety of uses and as one with commonplace words it is not difficult to imagine a situation in which what the term connotes is unique to different individuals. The use among academics may fall into a range of different meanings, based around the criteria which Webster listed as core concepts to all understandings of "information society" within academia, but ultimately the conclusion of his work must be a silent call for other academics either to analyse their own use of the term and to make more clear what it is the term means for them individually or, more drastically, to simply relinquish the term completely in favour of another, more salient term.

What remains is by far a more difficult question to answer: how can we understand what information society means when used by a politician?

The difficulty in understanding the term is no better shown than by what has been written by European Politicians. In the *Presidency Conclusions* at the Lisbon European Council in March, 2000, the terms "knowledge-based economy", "information society" and "knowledge society" are used casually, but not in any clear way to show the terms to be mutually exclusive, or even antonyms of one another. The vague use of such terms is not limited to an occasional document; instead, it is a systematic failure throughout the EU to present a clear vision of what exactly it is that one should expect "information society" policy to achieve.

The difference between the academic and political usage of the term information society is not what the term means, or even the extent of agreement between individuals on the meanings of the terms. Within academia the term has disparate meanings; each academic may have an equally strong idea of what the term denotes, albeit completely different to the ideas of other academics. The impression one gets from the political use is not one of individuals using the term in a clear, but disparate, way. One struggles to find anything in the way of a concrete statement on what an information economy would constitute, how exactly the policies of the Lisbon Strategy would effect a shift into an information economy, or even if it would affect what appears to be an already extant process of change in the nature of society.

'Businesses and citizens must have access to an inexpensive, world-class communications infrastructure and a wide range of services. Every citizen must be equipped with the skills needed to live and work in this new information society. Different means of access must prevent info-exclusion. The combat against illiteracy must be reinforced. Special attention must be given to disabled people. Information technologies can be used to renew urban and regional development and promote environmentally sound technologies. Content industries create added value by exploiting and networking European cultural diversity. Real efforts

must be made by public administrations at all levels to exploit new technologies to make information as accessible as possible.'

(European Union, 2000:section 9)

The feeling one gets from such statements is one that the writer felt the terms used had already been sufficiently explained to be used without requiring a specific definition for their own use of the terms.

In the absence of clear definitions, one is required to infer what is meant by such terms through their use. In particular, it is telling to examine how an "information society" is envisioned both through predictive statements on the topic and what the goals of policy aim to achieve.

2.2. Visions of an "information society"

It is clear from statements like 'The European Union is confronted with a quantum shift resulting from globalisation and the challenges of a new knowledge-driven economy' (Presidency Conclusions, section 1) that the position is one of accepting the inevitable – a clear change in the nature of the economy of the European Union as a whole. That we can assume it will result in a change to society is clear because the 'changes are affecting every aspect of people's lives' and it is the assumed position of the 'Union [to] shape these changes in a manner consistent with its values and concepts of society' (ibid.). It is stated that Europe must look toward 'an emerging new society which is more adapted to the personal choices of women and men' (section n 6) and ensure a situation in which 'citizens must have access to an inexpensive, world-class communications infrastructure and a wide range of services' (section 8).

The clear thing from these statements is that the EU vision of the "information society" is blindingly utopian, likely due to the period in which the Lisbon Strategy was born – a period of significant economic growth and prosperity throughout the European Union, marked with a fast rate of EU enlargement. When compared to the so-called euro-crises a few years later, it is clear that the rhetoric of politicians has a direct relationship with the confidence in the market generally; the Lisbon Strategy was devised during a period of complacency in which it was assumed that the growth exhibited was sure to continue unabated.

The result of such complacency is a vague, poorly-defined vision of an information society; one in which things are simply better because the populace is better educated and therefore the market can increasingly rely upon an information-based focus. Within this vision are the broad concepts of greater gender equality, social inclusion and coordination throughout the union. The question of how these goals may be achieved is laid out in the established policies and goals of the strategy.

2.3. The proposed goals of the Lisbon Strategy

> *The Union has today set itself a new strategic goal for the next decade: to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. Achieving this goal requires an overall strategy aimed at:*
>
> *- preparing the transition to a knowledge-based economy and society by better policies for the information society and R&D, as well as by stepping up the process*

of structural reform for competitiveness and innovation and by completing the internal market;

- modernising the European social model, investing in people and combating social exclusion;

- sustaining the healthy economic outlook and favourable growth prospects by applying an appropriate macro-economic policy mix.

(European Union, 2000:5)

The only clear way in which one could establish something unique in the above section is the first set of goals with regards to the knowledge-based economy. One would hope that the *modi operandi* of government are to modernise and promote economic growth; in so much this strategy has not established a new position. Any understanding of what 'better policies' would mean for such an unclear term as information society is left open to the interpretation of the individual reading the text. All that is clearly targeted by the Lisbon Strategy is a process of increasing the role of research and development; naturally, research and development could be considered one of the single most heavily knowledge-based sectors within an economy. Clearly ICT literacy and computer access would be key among the measures that government would use to ascertain how prepared a population would be for an increasing role for the information- or knowledge-based sector within the economy.

2.3.1. A clear, political view of the information society?

With the new millennium came the massive spread and use of the term information society in political planning, however at no point throughout its use had it ever been satisfactorily

defined, examined or made open to serious discussion. As has been noted (Karvalics, 2007), the contradiction became vague and diluted due to the quick take-up and popularity of the term. Based upon the use of the term by the EU in the conclusions which formed the basis for the guidelines of the Lisbon Strategy it is clear that far from making the term more coherent, the incoherence is increased due to vague and imprecise language.

The problem in determining a concrete idea of what exactly is meant by information society for the EU is most difficult because it seems that the word is not used with a particular idea in mind, instead it appears to be a case of jumping on a bandwagon without having put in serious thought as to how exactly policy will create an "information society". The most notable policy, as established in the Lisbon Strategy and continued in the Europe 2020 strategy, that is proposed to bring about the process of a shift towards the "information society" in Europe is one of increasing access to ICTs, especially in public spaces and by promoting affordable access through business. In most respects the established position of the EU has not changed significantly since the Bangemann Report (1994), in which it was stated (p. 38):

> *The provision and widespread use of standard trans-European basic services, including electronic mail, file transfer, video services, should be promoted by urgent and coherent action at both the European and Member State levels.*

This statement presented the core of the EU's strategy towards ICTs in the mid-1990s and, throughout the first decade of the new millennium, was essentially what politicians mean by promoting the "information economy". The Lisbon Strategy and Europe 2020 both set targets based upon this core policy.

3. COMPUTER LITERACY

Understandably, computer literacy is an intrinsically difficult measure to define; any definition must be driven by context. A computer technician, for example would have both a different type and level of competency and knowledge with ICTs to an office worker, or any other profession. Hence any definition of computer literacy must take into account what any individual would be expected to be able to do with an ICT. In itself this is would require an open definition of computer literacy, but not necessarily a meaningless definition. One could define computer literacy in terms of an individual's general cognitive and technical capabilities at performing tasks expected as part of being a functioning member of society.

One of the most effective approaches to understanding and discussing computer literacy is the "blended approach" (ETS, 2002; ETS, 2003) in which literacy was defined to be, "using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society" (ETS, 2002:16; Markauskaite, 2007) and from this definition Lina Markauskaite extended the definition to assessment criteria when understanding how to determine literacy and to create a standardised framework. She ascribed the required set of capabilities necessary "for the successful completion of cognitive information and ICT-based tasks" under two categories: general cognitive and technical (2007:550).

For Markauskaite, there are nine areas of literacy for assessment, to: plan, access, manage, integrate, evaluate, create, communicate, collaborate (interpersonal capabilities) and to reflect and judge (metacognitive capacities) (ibid.) and she states that "ICT-literate individuals must possess capacities in all areas and in each area, that they should have both a general problem-

solving capability and related to IT technical knowledge and skills (Markauskaite, 2005; ETS 2002; ETS, 2003). What remains are two concerns, how these skills should be balanced against one another and what is the precise relationship between skills individually. Such considerations are subject to the individual interpretations of academics.

The capabilities that Markauskaite describes are derived from psychological and sociological principles and as such there is not a clear line to be drawn between those principles and a clear method of determining computer literacy among the population. Markauskaite herself uses the criteria for establishing the structure between general cognitive and technical capabilities for ICT education. There are some who have argued that both cognitive and technical capabilities are important, and equally so, in the area of computer literacy (ETS, 2002) while others have argued that ICT skills represent a new and unique skillset, which are unrelated to computing (Kurbanoglu, 2003). This lack of clarity makes identifying a clear method of determining computer literacy in individuals difficult, due to the ambiguous nature of the core skillset required to have computer literacy.

Clearly, such ambiguity makes defining Computer literacy difficult to discuss meaningfully, as a clear scale of literacy – ranging from literate to illiterate – would be a compromise between differing academic perspectives. As a standardised method of establishing what exactly computer literacy entails would rely upon a concrete understanding of the concept, it is clear that there is some way still to go to accurately measuring computer literacy via statistical methods.

One approach to understanding computer literacy may be to go about using a solution based on proxies. One such proxy is the measure of computer anxiety, which a number of scholars have suggested play a direct role in computer literacy and, provided one studies a population

with similar access to computers (i.e. a population from a single country, or a series of countries with similar development and ICT availability), can be used as a direct measure of computer literacy. As computer literacy can be understood as the ability to engage with and to use information, as well as to create information within a computing environment, so computer anxiety can be understood as having an disproportionately high fear of computers relative to the actual risk they possess to an individual (Howard, Murphy and Thomas, 1986)

Needless to say, there is a broad spectrum of fear, ranging from a very mild emotional discomfort through to those behaviours most commonly understood as phobic; *technophobia* can take many forms, be it an absolute fear of technology itself, or the less accepted – but more specific – *cyberphobia:* a fear of computers and the inability to learn how to work with digital technologies (Sandywell, 2006). Computer anxiety is most commonly a transient condition with peak intensity among those with "limited" experience with computers, as moderating computer "anxiety is largely beyond the jurisdiction of the novice, simply because the novice lacks sufficient procedural knowledge". (Anderson, 1996)

The strength of computer anxiety as a proxy for computer literacy has been shown in studies (Heinssen, Glass & Knight, 1987; Chu & Spires, 1991; Anderson ,1996) in which computer literacy has been determined by individual assessment and compared with an established tool for measuring computer anxiety; for example, the computer anxiety rating scale (CARS).

What has been determined is that those individuals who are most computer literate (based either upon self-assessment or assessment by a third party) show the lowest levels of computer anxiety. This is due to a number of factors, of which the most important are self-efficacy, understanding the technology behind computers and, most importantly, time spent using the technology itself. The last two of these factors are readily comprehensible to most

in that familiarity is generally understood to reduce anxiety in new environments and activities; a phenomenon which is an everyday occurrence and therefore one with which anyone may empathise.

The role self-efficacy plays in computer literacy and computer anxiety is one derived from an individual's self-assessment of ability to use and to learn to use a computer for a specific task.

Self-efficacy itself derives from social-cognitive theory, referring “to a belief in one's own capabilities to organize and execute the course of action required to attain a goal” (Markauskaite, 2005:55; Bandura, 1994). This is based upon four sources of information: previous experience, observation of the performance of others, social persuasion from peers, colleagues and others, and psychological and emotional states from which people judge their capabilities. Self-efficacy is important because an individual's actions are based more what is believed that what is really true (Bandura, 1997). Self-efficacy affects levels of motivation and an individual’s actions. The psychological role of self-efficacy has been shown to be “particularly important in the area of ICT-related capabilities” (Markauskaite, 2005:55) by Kurbanoglu (2003). An individual's feelings of competence and confidence are directly related to the likelihood that an individual will attempt a solution to a problem. “If s/he does not have some specific skills, it is likely that a person with high self-efficacy will expend more energy and time on acquiring required skills than will someone with low self-efficacy” (Markauskaite, 2005:55; Kurbanoglu, 2003). Thus it is clear that self-efficacy and self-assessment are key tools in determining actual capabilities with computers.

Familiarity with computers is the best single measure to use as a guide for determining computer anxiety (Anderson, 1996). The more regularly an individual uses a computer the better their knowledge of necessary computer skills and also the more willing an individual

would be willing to approach problem. Additionally, greater familiarity allows a greater understanding of the procedures required to undertake tasks with computers.

3.1. How to accurately measure computer literacy in the population

The core concept being discussed is, of course, computer literacy – naturally, there are no direct statistics to measure computer literacy. Therefore, a series of measures are used as proxies for computer literacy. The measures include computer access and usage, Internet access and usage as well as the variety of activities that individuals use the Internet and computers for. These provide an idea of the nature of computer and Internet use among the population.

Of these measures, it is hard to imagine a set of statistics which could adequately point to any variance in self-efficacy; it is an inherently socio-psychological concept and as such does not fit naturally to the statistical data which have been collected by statistical offices in the West. Familiarity with computers can be much more accurately understood, by determining who uses computers, how often, where and when, and also it may be possible to determine what individuals use computers for in certain circumstances.

One of the main problems with compiling statistics in the field of ICTs is that, the subject matter is subject to a much greater rate of change than other, more biologically-, or economically-determined subjects. If one is to find the birth rate, or death rate for example, the core concept of birth and death are fairly universal, similarly measures of GDP have congregated around a standardised methodology for finding GDP within populations. For the most part, the statistics for these measures have not undergone a significant change in their methodological understanding.

Compared to computers, which have only been in the public domain for a few decades, there have been a series of major shifts in the understanding of what a computer is and what tasks a computer can be used to do. In addition to this, the computer has gone from being a singular concept – albeit with different brands and operating systems from the outset – to being one device among many, all of which are capable of both individual tasks as well as the same tasks as others. The result is that ICTs have become significantly more difficult to discuss meaningfully over time; a problem only made greater due to the difficulty associated with predicting where the future lies with ICT devices – both in terms of what will become possible and what any single device will be used for by users.

In the early 21st Century, it became apparent very quickly that there was a shift taking place, from the stationary home- or office-based desktop computer to a wealth of portable devices, resulting in the marrying of two portable devices (the portable computer and the mobile telephone) to create modern smartphone and tablet devices. Not only would the compilers of statistics been completely unaware of where we would be now 20 years ago, but they had no idea of what such technologies would be used for, by whom and how spread such devices could become. Developing statistics which will be meaningful ten or 15 years hence is impossible under conditions like those.

Over the past few years, compilers of statistics the world over have been forced to realise that the descriptive systems used in statistics are not keeping up with the pace of social and economic change. The internationalisation of economies, globalisation, the rapid advance of the new technology, changes in production structures, business reorganisation and so forth all place increasing pressure on the national statistical systems. As the importance of the

intangible economy grows, the foundation of the traditional compiling of statistics, based on readily identifiable and measurable parameters, is being eroded.

(Jeskanen-Sundström, 2003)

The onus on the use of statistics must be to find meaningful conclusions about people, taking the statistics and finding some degree of important insight. In terms of the statistics for computer literacy previous works by have established a series of hypotheses which it is important to test to establish first, how individual populations compare to trends found elsewhere and secondly, to establish how these trends vary from place to place.

The work of Frank Webster to critically analyse the academic use of the term information society had the unintended consequence of having a greater role in proving its ineffectuality. His works critiquing the term alone have become dwarfed by his work attempting to define the term. This is due to the prevalence of the term; it has seemingly become escapable in the political sphere and, therefore, will remain in the academic sphere, if only in the political sciences.

The reason why the term is so popularly used in the political sphere is not apparent – perhaps it is simply due to the resonance that people feel with the changes in the last two decades due to the massively increased popularity of computing.

However, the term is essentially meaningless as it is used in a particularly varied way by almost every person who uses it. The result is that its use as guidelines by the EU is far from clear and leaves the Lisbon Strategy as purely a wide-ranging but essentially aimless document. The result is that regional policy-makers are left to their own devices to attempt to

interpret the guidelines and aims of the strategy even more than one would naturally expect from guidelines in other fields.

The greatest cause for concern would be that the terms used have not been clarified, and the Europe 2020 guidelines are just as loosely worded as those of the Lisbon Strategy. It appears that, despite the lack of any salience that these terms can reasonably bear, the EU has accepted their usage, regardless of criticism. The reality is that this is simply a case of political apathy, as it may require significant effort to bring everyone together under a single set of definitions.

4. ESTABLISHED TRENDS IN THE LITERATURE

Age: It is generally found that age shows an important correlation to computer anxiety and ability (Palfrey and Gasser, 2008). Older adults tend to be less capable with computers and more anxious than younger adults. (Igbaria and Parasuraman, 1989, Rosen and Maguire, *Myths and realities of computer phobia: A meta-analysis*, 1990; Rosen and Weil, *Computer Anxiety: A Cross-Cultural Comparison of University Students in Ten Countries*, 1995; Anderson, 1996)

It is established that computer anxiety among younger adults and older adults take particularly different forms. Among younger adults computer anxiety tends to be less generalised and more specific – anxiety arises, not merely in response to computer use or being in an ICT environment, but instead with a specific regard to computer tasks.

Among older adults computer anxiety tends to be more generalised (Dyck, Gee & Smither, 1998). This is a natural response to a higher basic level of computer literacy among a larger proportion of the young adult population.

It should be understood that it is an unreasonable assumption that younger adults will be a homogeneous group. Whilst young adults are generally the most computer literate group, it has been shown that an expectation of computer literacy can result in individuals showing greater anxiety and lower self-efficacy with ICTs (Selber, 2004; Messineo & DeOllos, 2005).

Gender: Sexual identity and biological sex appear to show no clear barrier to computer literacy (Howard, Murphy & Thomas, 1986; Cohen and Waugh, 1989; Igbaria and Parasuraman, 1989: Ray and Minch, 1990); however studies have shown that there are differences in some circumstances based upon sex (Dambrot, et al., 1985, Gilroy and Desai

1986). It has been shown by Rosen and Maguire (1990) that there is often a difference in computer anxiety with reference to sex, but that the difference was “minimal” (Anderson, 1996: 64).

Computer culture is heavily gendered towards males, based on a study by Ware and Stuck (Ware and Stuck, 1985) “males were predominant in illustrations... Where women appeared they were depicted in the less powerful and often passive role, or as sex objects” (Anderson, 1996:64) in popular computer magazines. Clearly societal conditioning leads women into roles with little computer expertise, often resulting in a lack of supportive training within the educational context for female students and an expectation of excellence in computing and related skills among male students.

As sex and computer anxiety were heavily studied in the 1980s, there was a stark lack of investigation into the subject in the 1990s. In the 21st Century a significant amount of scholarly investigation in the field of education and educational best practice has made up for this lack of examination. For the most part the findings of Rosen and Maguire (1990) appear to have held true, that sex itself is no barrier to computer literacy, but that there is a demonstrable, albeit minimal, difference between the genders. This should be expected to be revealed in the data.

It is also likely that the social norm for computer and technical capabilities primarily among males will become less apparent for younger adults, as the availability and the occurrence of ICTs have increased significantly over time. The increase in occurrence, especially, should increase familiarity that individuals have with ICTs, as well as increasing the proportion of the population who use ICTs on a regular basis. The result is that the increase in literacy we see among young adults is going to occur in both sexes and the effect is that the (already

minimal) percentage difference between computer literacy among males and females will be reduced still further.

Experience: It is nearly universally shown that experience with computers in an inverse correlate to computer anxiety (Rosen and Weil, 1995; Ray and Minch, 1990; Anderson, 1996), therefore it can be understood that those with the greatest computer experience should display the highest levels of literacy. In the case of the Czech Republic, government policies to establish reliable access to computers, regardless of income, place of residence or social factors has meant that the availability of computers, especially in public venues, is significantly higher now than prior to EU accession. Similarly, programmes to include ICT education within schools have meant that all school students should expect to have had some experience with a computer. This implies that computer usage should be high among minors in the Czech Republic.

It is reasonable to suggest that experience should correlate to age, that young adults, especially those of university age should be using computers most regularly in all settings, whilst older adults will tend to use computers less in a domestic setting. As the Czech Republic is a fairly well-educated country within Europe there should be a high proportion of adults generally using computers in the workplace.

Income: Due to the social effects of communism Czech society has generally been argued to be largely classless (Večerník, 1999); however there is a fairly large degree of variation between incomes in different households in the modern Czech Republic. Often, this variation is linked closely to ethnicity – it may be no surprise that immigrants from Eastern Europe tend to work as unskilled labour – and the structure of the household – single parent households are often low income households. Whilst ICTs are significantly more affordable

nowadays, as they become increasingly widespread, it remains a significant expenditure to have a computer in the family home for low income households. On the basis that low-paid employment tends to be less office-based, it stands to reason that households with less income would exhibit lower figures for the regularity of computer use in both workplace and domestic settings.

Location: It is likely that location will play a role in Internet access in particular. As Internet services are most commonly run along cables (Dial-up, ADSL, ISDN, Optical cable, etc...) the cost of installation of the cables must be offset by Telecoms companies by the potential revenues that can be made through line rental or purchasing Internet services. As a result, larger centres of population – cities, towns – often have access to faster and cheaper Internet connections than those in rural areas at the early stages of Internet introduction. The cost of using the Internet at home is likely to result in a lower number of households in rural areas of the Czech Republic from having an Internet connection.

This may play on to have a role in preventing households from having a computer, in such a case as the primary reason for having a computer may include online functionality. In such a case, due to the higher costs of the latter, the former may be considered an unnecessary or undesirable expense. It may be the case that this will mean that fewer households have a computer at home – though such as effect would likely be small

.

4.1. A working hypothesis

The consensus has been that the Lisbon Strategy failed due to a simple lack of effectual policies to achieve the aims of the strategy (Charlemagne, 2010). This is attributed to political apathy, meaning that the progress made in member states to achieve the goals laid out in the

guidelines has been purely due to the extant market and social forces in society and not due to the activities of government. Therefore it should be the case that:

H1: ICT and Internet use would be most prevalent among younger individuals, with teens higher than young adults, with a clear trend which shows a decrease among older individuals. They will spend a greater amount of time using both ICTs and the Internet and they will engage in a larger variety of activities.

H2: There would be a significant relationship between where people live and Internet use, in particular the major population centres (Prague, Brno, etc…) would have the highest levels of ICT use and Internet access.

H3: The most highly educated members of society will be the highest users of ICTs and the Internet, especially in the case of tertiary education – which increasingly nowadays requires people to be computer literate nowadays.

If these hypotheses are incorrect, then one would expect to find a high degree of growth in low-ICT user groups to meet the highest performance groups, ultimately with the intention that all groups have equal access to ICTS and equal knowledge of how to use them to perform a range of tasks, due to the familiarity of use and low levels of computer anxiety. Therefore, there should be effective policies to promote ICT use and literacy among the sections of society which are least likely to be using ICTs.

5. REVIEW OF THE SOURCES USED

Czech Statistical Office *(Český Statistický Úřad, ČSÚ)*

The ČSÚ data have primarily come either from the census, annual Labour Force Surveys, in the form of a computer assisted personal interviewing (CAPI)[2], and also from collating data from other sources, primarily in the case of ICT infrastructure[3] and education[4]. This means that the data used by ČSÚ is taken from the largest sample group, in some cases representing the entirety of the Czech population, in others just a small sample group.

As the ČSÚ is the statistical office of choice for the European Parliament, it conducts its research according to **Regulation (EC) No. 808/2004 of the Eurpean Parliament and of the Council concerning statistics on the information society**, which allows the data across the EU to be easily compared. A point of note should be made that, although the majority of the data collected by the ČSÚ and the data published by Eurostat should be the same, the figures use different assessments, for example minimum household size. As such the data are not completely comparable.

World Internet Project *(WIP)*

The WIP data are collected by universities and research institutes around the world, the data is then centrally collected and the WIP conducts detailed research on them. In the case of this

[2] As an example in 2010: 8700 individuals from 4400 households.
[3] Czech Telecommunication Office (CTO), International Telecommunication Union (ITU) and The Organisation for Economic Co-operation and Development (OECD) – each of these sources are based on subscription numbers which should give the most representative figures, due to there being no need for sampling techniques.
[4] Institute for Information in Education (IIE)

piece of research the original source data has been used which was collected by local researchers.

The sample size used ranged from a minimum of c. 3,000 in 2005 to a maximum of c. 4,400 in 2008. The biggest disappointment is that the WIP data for the Czech Republic was not collected in 2009 or 2010 and that therefore it is difficult to compare year-on-year difference between the two sequences. However, it is balanced as it is a single dataset which can be compared with any of the other datasets collect by the WIP in the same year in countries in the rest of the world. That gives it a hugely important and useful possibility to be compared on the global scale.

Ministry of Informatics *(Ministerstvo Informatiky, MI)*

The MI was a short-lived institution in the Czech Republic, which means that the data published are extremely limited to one year, one point in time. However, the data collected was for a government body, therefore the sample size is very large for the 2005 data (c. 15,800). The data was retrieved via survey by having sections included in existing surveys, to minimise the logistical difficulties of adding another, new survey.

In itself the limiting qualities of having one spot year of data means that it would be the most difficult to compare to the other sources, however it will allow the author to more critically appraise the methodology used in each of the three, in such cases as there are large differences

6. ANALYSIS

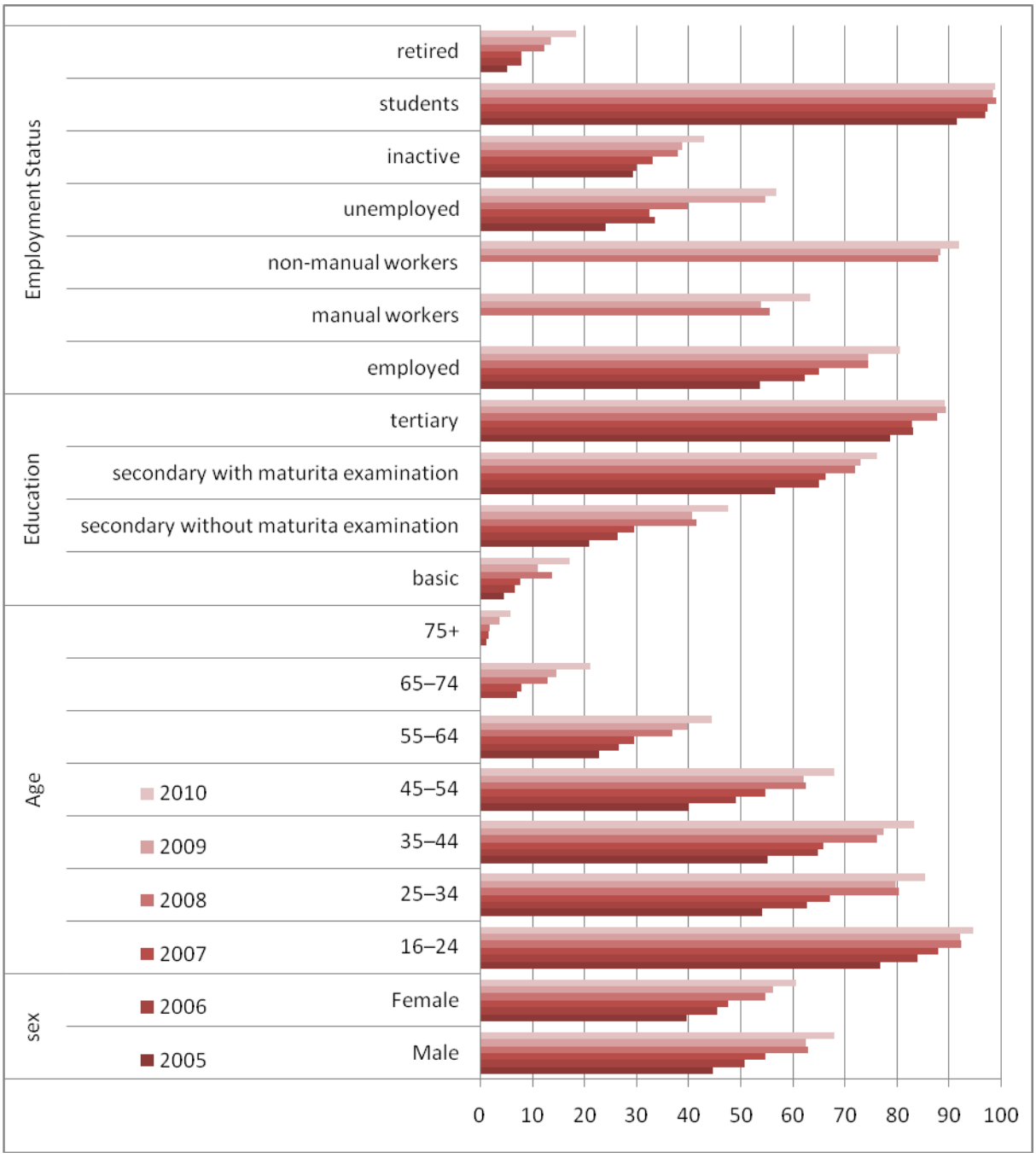
The analysis of the data will come in four sections; the first two will be an attempt to establish the numbers of people in the Czech Republic who are, in the most basic way, either computer users or non-computer users. This assessment is due to the nature of the statistics available, all of the datasets include information on whether or not individuals use the Internet and the ČSÚ data includes information for whether or not individuals use a computer. Whilst individuals who do not use a computer may still be computer literate, it is a good proxy, as it describes people's behaviour.

The second two sections will be aimed at presenting a more detailed look at those individuals who do use the Internet and a computer. In particular, the third section will deal with the amount of time individuals spend using computers and the Internet in hours per week. The fourth section will present data of people's activities on the Internet, what people do online, how often and which activities are associated more with certain sections of society.

The aim of the analysis is to establish whether the hypothesis presented is correct and the guidelines suggested in the Lisbon Strategy have made little difference to growth in computer and Internet literacy in the Czech Republic due to a lack of effectual policies.

6.1. *Personal Computer Use*

Figure 1 – Personal computer users in the Czech Republic, 2005-2010



(ČSÚ)

From the selected sources only the ČSÚ provides data discussing how many households in the Czech Republic actually have computer access. Considering that in Western Europe the

personal computer was unchallenged as the means by which to access the internet until the coming of the smartphone (popularised in the period immediately following the new millennium) and tablet computer (popularised by the Apple iPad) into mainstream use, one would consider that the way the Internet is used may be subject to significant change. Clearly, the social nature of Internet use will be subject to change as the Internet becomes significantly more accessible with various mobile ICTs. With ultrabook-tablets and a variety of innovations in the market of mobile computing, it is clear that the nature of Internet use in the developed world is going to go through significant changes. When comparing Internet use on a global scale, the affordability of smartphones compared to mobile computers mean that experiences of the Internet are going to vary significantly between the countries where smartphones are the most common method of accessing the Internet and those where ICT ownership is more affordable. It should be a priority for research tools to take into account the medium by which individuals use the Internet as the role of the Internet in our social experience must be directly connected to the experience had when using it; part of which *must* be the tool used.

In the period 2005-2010 the Czech Republic saw a near doubling in the ownership of personal computers, from 30.0% to 59%. This suggests that policies to encourage ICT use have made some effect, but it is difficult to tell whether it is due to policies or whether their effect has been entirely incidental. For example, both employed and unemployed individuals have shown significant growth in computer access over the period 2005-2010 (employed: 53.5-80.5%, unemployed: 24.0-56.7%), suggesting that both groups had a similar reason for buying/using computers. In 2010, 92.3% of unemployed individuals and 92.4% of employed individuals use a personal computer in the home, nearly twice the proportion of unemployed individuals had used a personal computer at another person's home, and other places of

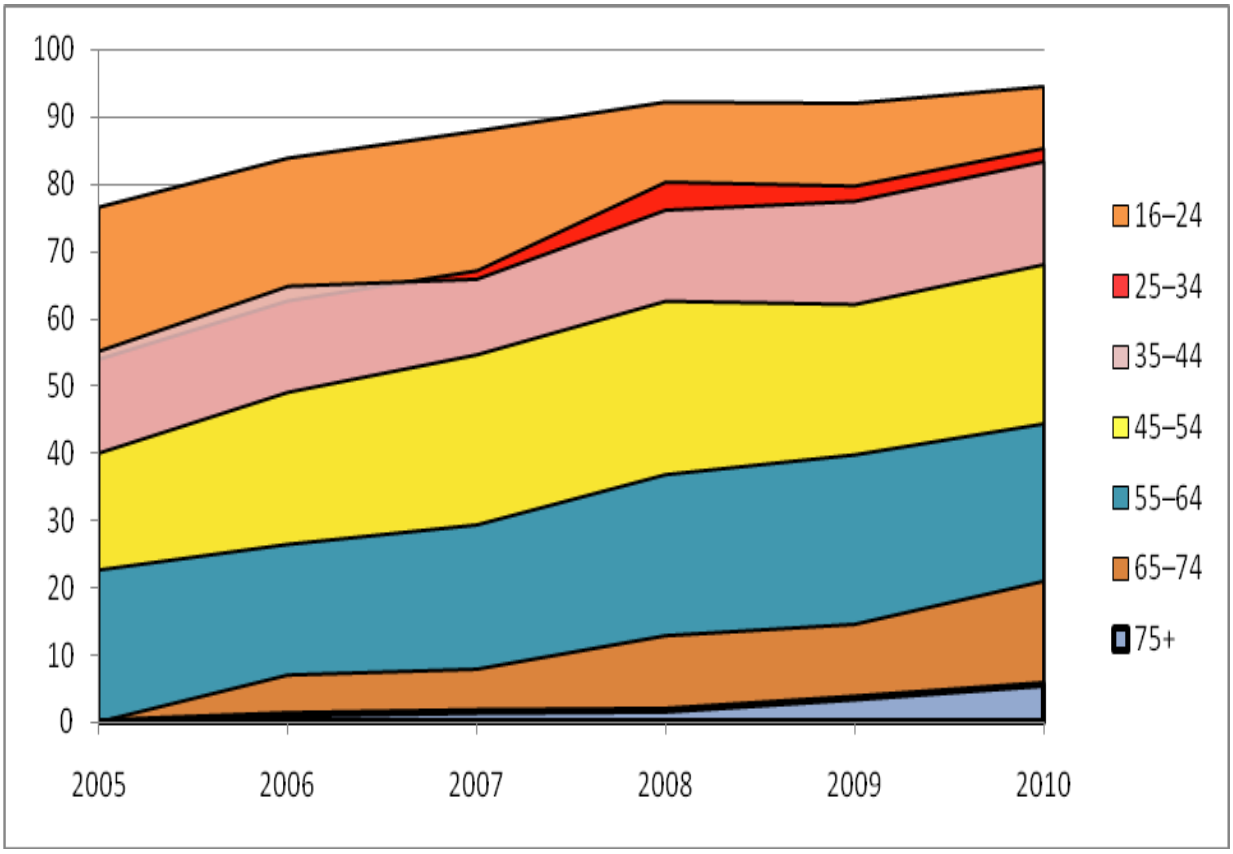
access were similar, with the obvious exception of "place of work". Thus, we can see that domestic computer use is common to both groups as the most common place; hence the factor which led to such a growth in computer use must have been similar in both cases, as they were both engaging in the purchase of an ICT for the home. This may be a result of the number of unemployed individuals living with employed individuals.

Lending some credence to the Lisbon Strategy's assertion that more ICT literacy among the population leads to higher employment, there is a clear difference between unemployed and employed groups in terms of computer use.

Similarly, as hypothesised the relationship between age and computer use is very distinct, the youngest age group available (16-24 years) shows significantly higher computer use in every year, although the gap decreases over time (fig. 2).

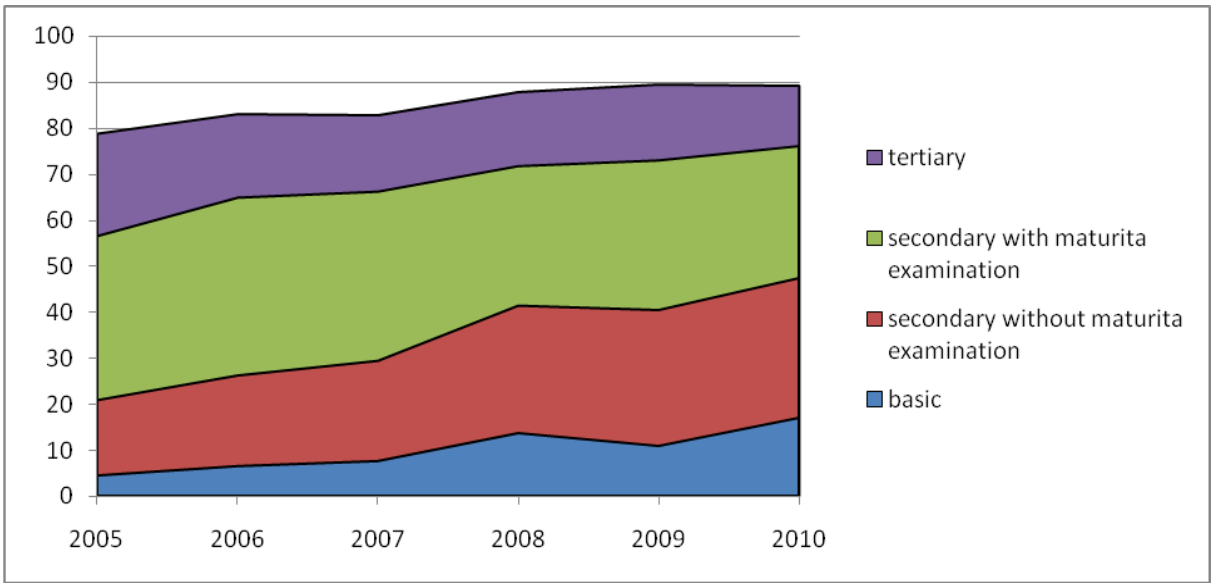
The initially high use of personal computers is in line with what one would expect from what has been written on the topic by academics, it is to be expected that the sections of the population with the highest computer use, young adults, would have a slowing rate of growth, as the mainstream of the population become computer users, it is those with the greatest impediment to not use a computer that remain. That is to say, those with no particular reason to not have a computer will start to use them as they become more commonplace and the social expectations to have one increase. It should be noted that students, one of the groups which consist of young adults primarily show the highest level of computer use: from 91.5% in 2005 to 98.7% in 2010 of students in the Czech Republic using a personal computer. This particular case shows the importance of education as a predictor of computer literacy.

Figure 2 - Personal computer use in the Czech Republic, age, 2005-2010



(ČSÚ)

Figure 3 - Personal Computer use (%) in the Czech Republic, education, 2005-2010

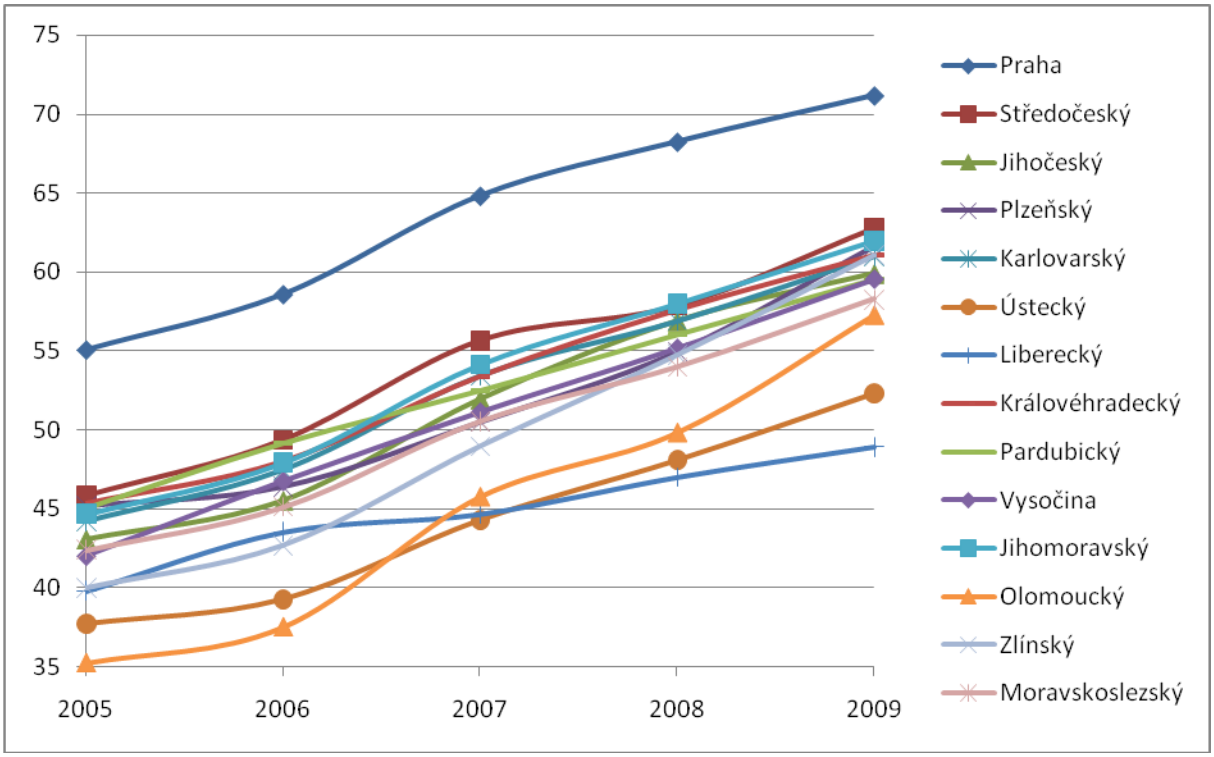


(ČSÚ)

Education is one of the most simple-to-use methods of determining computer literacy in the Czech Republic, the four groups used are separated clearly and while there is some convergence between the highest two performing groups, which will ultimately come together, the groups do remain clearly differentiated in terms of computer literacy. As the population ages, this measure is likely to become less valuable, presuming that computer literacy remains a skill which individuals will maintain into later adulthood. The most interesting question this data raises is whether the pattern for computer literacy among the most highly educated individuals follows the same pattern as age; that the non-computer users tend to be the oldest individuals. Unfortunately, the raw data necessary was not made available for this study, so this analysis cannot be performed.

Another, less clear relationship is between the region of the Czech Republic and individual comes from and personal computer use. In some respects the trend is as expected, as the wealthiest region in the Czech Republic, as well as having more professional employment, which one would expect would mean that a greater proportion of university-educated individuals, Prague has the highest levels of computer use (fig. 4).

Figure 4 –Personal Computer use (%) in the Czech Republic, regions, 2005-2009



(ČSÚ)

However, the rest of the regions in the Czech Republic do not follow a clear pattern. Olomouc region, which one would expect to have a relatively high level of computer use due to the presence of the University and the city, is especially low in 2005, and yet significantly higher by the end of 2009. This could be explained by the large amounts of poorly educated workers in the city, as it is known as a factory city. If so, then the explanation for why it shows the greatest growth in computer use between 2005 and 2009 is not obvious. Similarly, there is no clear Bohemia-Moravia divide; in 2005, the Central Moravian region showed above average levels of computer use, second only to Prague, while the Liberec and Ústí nad Labem regions were both rated worst in 2009. The Ústí nad Labem region was one of the slowest regions to show a growth in computer use, whilst the Liberec region was the poorest performer in terms of growth of all regions. While, traditionally, one expected the Moravian

regions to be less developed than Bohemian and the Silesian region to be the least developed, the reality is not so clear. While individual regions may be explained by individual policies or government subsidies for services, the image lacks any coherence due to the diversity in growth performance in different regions. Clearly does play a role in determining the likelihood of an individual household having computer access, but it is one of the least useful measures for establishing a predictive relationship.

6.1.1. Comparing ČSÚ data with WIP and MI data for computer use

That the only source with extensive data into computer usage or ownership is from the ČSÚ is a potential flaw in the other datasets. Clearly, understanding what tools one uses to access the Internet is an important issue when assessing social change due to the presence of the Internet. It is the recommendation of the author that not only should data be collected for Internet use, but also computer use as it will allow deeper analysis into a range of subject matter:

- Why people are using computers. (The ratio between computer use and Internet use would be important to answer that question in part)
- What kind of experience people are having when using the Internet.
- *Where* people are using the Internet.
- *When* people are using the Internet.
- The activities for which the Internet is used, as well as *which* activities are used, when and where.

  For example, is social media used mainly domestically, or is it also used in the workplace? Is it used via smartphone or using a personal computer in the workplace?

When do individuals do different tasks on the Internet; e.g. Internet shopping, reading/sending email, browsing, reading the news, etc..? Also, the question remains whether some of those activities happen primarily in one setting or on one device, or another.

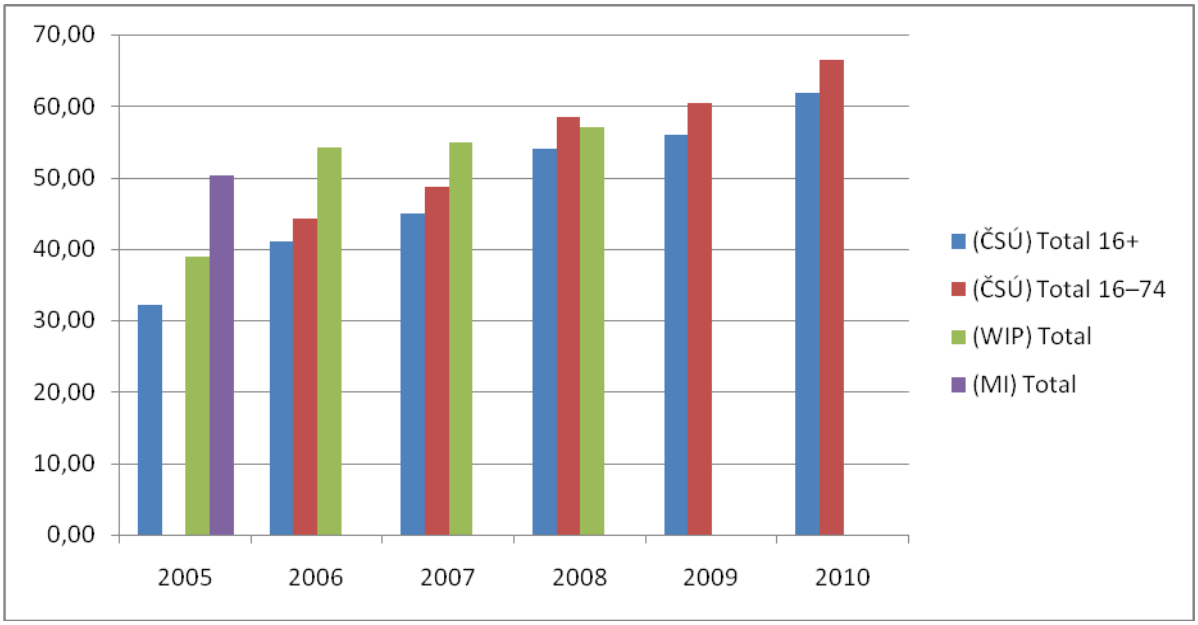
More importantly, it is a concern that current data are assuming that the primary tool of Internet use is a desktop computer, without questioning either the assumption that (a) Internet use primarily takes place on a computer and (b) computers are primarily owned to engage in tasks which necessarily include Internet use. Whilst those assumptions may be correct, it is foolish to assume that the nature of such situations will not be subject to change. If such assumptions are not made, then the onus is on the publisher of the data to make it clear what is the assumption, or to show the data to prove any established principles.

Additionally the author notes, that in the absence of data either to confirm or deny the ČSÚ data's accuracy, it is necessary to blithely put faith in its accuracy when discussing what it means for the working hypothesis.

6.2. Internet Use

As the Internet is the primary subject matter of the WIP research and the MI paid specific interest to its use, we can perform a more thorough analysis of the situation in the Czech Republic. This gives an opportunity, for the first time, for the ČSÚ stats to be compared and questioned.

Figure 5 - Internet users (%), 2005-2010, comparison



(ČSÚ, WIP[5], MI)

In figs. 5 & 6 we can see that there is a sizeable discrepancy between the figures between the various sources, from year to year, most noticeable is the variation in the figures, which is significantly lower in the years for which there is no MI data. Also, interesting would be if there were figures available from the WIP in the years 2009 and 2010, as they show greater agreement over time. It would be interesting to see if the two figures do converge; based upon extrapolation it may be the case that the results would converge (fig. 7). Considering the small number of years' data, it may not be fair to use it as a projection; it may be more accurate to consider it an estimate on the part of this study's author. In this case the data is presented in one of two ways, for the WIP and MI data the published data gives the number of respondents which answered in the affirmative to the question of whether they use Internet. In the ČSÚ data simply states the (a) number of positive respondents (or the amount

[5] The WIP data is taken for all individuals over the age of 12.

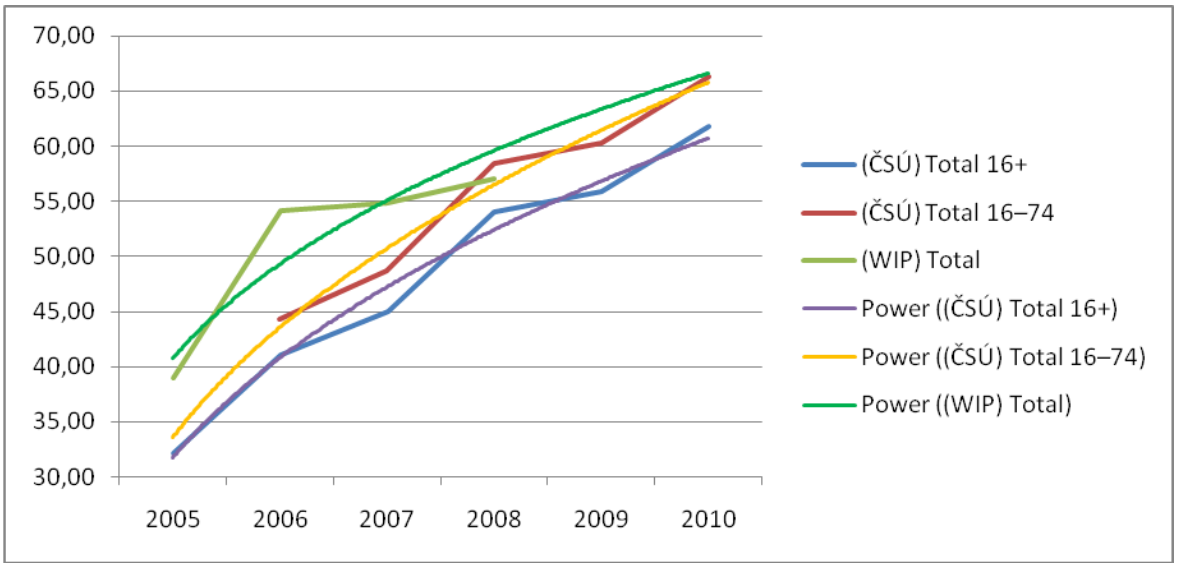
of people subscribed to a particular service – i.e. household with internet access) and (b) the percentage that is of the total sample.

Figure 6 – Table of figures for total Internet users, 2006-2010, comparison

		2005	2006	2007	2008	2009	2010
(ČSÚ)	Total 16+	32.11%	41.01%	45.02%	54.04%	55.94%	61.83%
	Total 16–74		44.25%	48.64%	58.41%	60.36%	66.36%
(WIP)	Total	38.92%	54.13%	54.82%	57.05%		
(MI)	Total	50.28%					
Standard Deviation		9.181407	6.834358	4.955958	2.236685	3.126652	3.204046

In fig. 6 the standard deviation is used as a statistical method to show how different the data sources' figures are, clearly the numbers from the MI are completely out of sync with the other data sources and the WIP and the ČSÚ data show greater agreement over time.

Figure 7 - Comparison of trends in Internet use (%), 2005-2010, comparison



(ČSÚ, WIP, MI)

In comparison of the figures, we see two interesting phenomena. The first phenomenon worthy of comment is the significant different between the MI statistics and the statistics

from other sources is that the MI data reports Internet use 11% higher than WIP and 18% higher than ČSÚ. The MI data is taken from a study population of 15,802 separate individuals, suggesting that it should be a representative study. However, two issues arise, the first is the target group of the data, in the case of the WIP statistics, there is a clear aim at comparing teenagers and young adults to the rest of the population, whereas the ČSÚ data is aimed at providing as close to an unbiased cross-section of society as possible; this context is not available from the MI statistics, as they are limited to one year's data and lack a clear provenance, as the ministry has been abolished. Similarly, the question asked is similar from each source – the MI question is not the broadest in scope, though it is essentially similar to the WIP, which is broadest inviting respondents to include "any other part" of the Internet:

Czech Original (MI)	English Translation
Využíváte v současné době některé z následujících zařízení nebo služeb? - Internet nebo elektronickou poštu	Do you currently use any of the following equipment or services? - the Internet or email
Czech Original (WIP)	**English Translation**
Používáte Vy osobně internet, to je www stránky, e-mail nebo kteroukoliv jinou část internetu z domova nebo z kteréhokoliv jiného místa?	Do you use the Internet for personal reasons, including websites, email or any other part of the Internet, either at home or in any other place?

The original question from the ČSÚ was not published with the data. Instead, the simple definition "Internet users" is used.

The WIP statistics are based upon a study size which ranges from year to year between (minimum, year 2005) 1,515 and (maximum, year 2008) 2,210 individuals, suggesting that

the MI data should be the most representative data source within the Czech Republic. However, it would be more realistic to assume that the ČSÚ and WIP figures are more representative as they show a closer relationship and that continues to become closer over time. Without data from MI for successive years, it is impossible to determine whether it is accurate or not.

6.2.1. The relationship between computer use and Internet use

As the ČSÚ provides data for both computer and Internet use, it is possible to compare the use of the two and, therefore, to determine what role the Internet plays in the decision to own a personal computer for Czechs and how important the Internet is as a task to perform on a personal computer.

Figure 8 – Table of Internet use in the Czech Republic, total, gender, 2005-2010u

		2005	2006	2007	2008	2009	2010
computer use	total 16+	42.00	47.97	50.89	58.67	59.21	64.08
Internet use		32.11	41.01	45.02	54.04	55.94	61.83
	Difference	9.89	6.96	5.87	4.63	3.27	2.25
computer use	males	44.6	50.6	54.6	62.8	62.5	67.8
Internet use		35.3	44.1	48.8	58	59.2	65.8
	Difference	9.34	6.53	5.80	4.84	3.30	2.00
computer use	females	39.5	45.5	47.4	54.7	56.1	60.6
Internet use		29.1	38.1	41.5	50.3	52.9	58.1
	Difference	10.41	7.36	5.95	4.43	3.23	2.49

(ČSÚ)

The clearest pattern is that the two groups follow very similar trends, as one can see from the correlation between computer and Internet use figures shown (fig. 8). It can clearly be shown that Internet use has risen with computer use and, as one would expect for a developed country, the personal computer is likely to be the primary tool used for Internet access. As

was stated earlier, it would be extremely valuable to have specific data to answer this question as it would be indicative of the kind of experience that Internet users are having. In figure 8, three variables are shown: total, male users and female users – this is purely for illustrative purposes; there are no significant differences with respect to the correlation or the merging of the figures for computer and Internet use in the data available.

Nowadays, personal computer ownership is not a pre-requisite for accessing the Internet, due to a large array of mobile devices which are capable of browsing the Internet and accessing online data. As this started to be the case towards the end of the 2000s, it would be interesting to see how this relationship, as found in the period 2005-2010, changes in the decade following. It would not be surprising to see Internet usage surpass personal computer usage, especially among young adults.

One can see from fig. 8b that the gap between computer use and Internet use does shrink more quickly among younger age groups, however – as can be seen in the very similar figures for correlation – the decrease in the gap between the two is not significantly greater than in other groups. This is not to say that the Internet has not become more important than in other groups; one must remember that this is a simple binary, either one uses or does not use the Internet. In the case of certain online activities (such as email use), one would expect take up to be fast in all demographics of Internet users.

Figure 9 - Table of Internet use, high performing groups, 2005-2010

		2005	2006	2007	2008	2009	2010	Correlation
computer use	16–24 yrs	76.6	83.9	87.9	92.2	92	94.5	0.995482313
Internet use		63.7	77.7	82	90.3	90.3	92.3	
	Difference	12.87	6.22	5.85	1.89	1.74	2.18	
computer use	Students	91.5	96.9	97.3	99	98.4	98.7	0.996945475
Internet use		77.5	92.8	93	97.4	97.3	97.5	
	Difference	13.96	4.04	4.31	1.56	1.11	1.15	

(ČSÚ)

It is interesting to note that a significant shift took place between 2005 and 2006 in this data. A similar increase is found in the broader data; however it is significantly more evident in these groups. That the difference is most clearly shown among students shows the importance that the Internet began to have within the education sector at this period.

The significance of age in Internet use

Figure 10 - Table of Internet users, 2005-2010, comparison

age		Internet Users ČSÚ (%)						Internet Users WIP (%)			
		2005	2006	2007	2008	2009	2010	2005	2006	2007	2008
16-24	12-18	63.7	77.7	82.0	90.3	90.3	92.3	85.3	88.3	93.1	91
25-34	19-30	40.5	54.0	59.7	73.9	76.9	83.1	53.4	71.8	79.3	82.7
35-44	31-45	41.1	53.7	56.4	69.4	72.7	79.7	43.1	61.8	61.5	67.4
45-54	46+	29.3	40.1	46.9	56.2	56.9	65.8	19.0	30.4	28.4	30.4
55-64		15.3	20.7	25.0	32.6	36.0	42.1				
65-74			5.2	6.9	9.7	12.0	19.1				
75+			0.9	1.3	1.6	3.3	5.1				

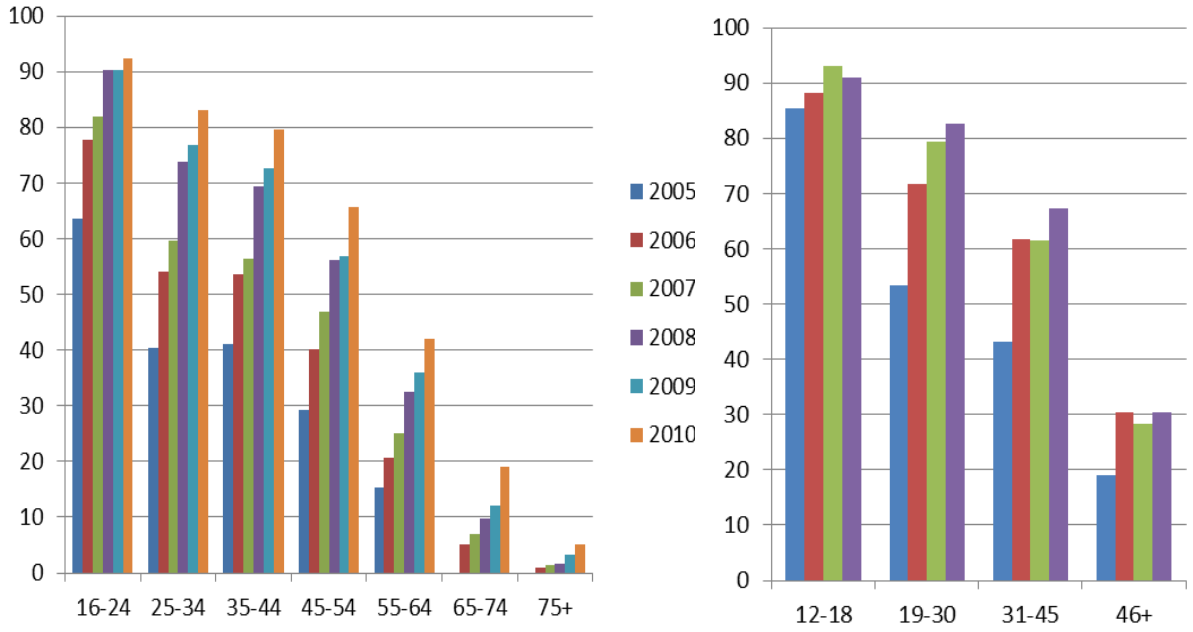
(ČSÚ, WIP)

In the hypothesis it was suggested that the Internet would become more important in all age groups, but the fastest take-up of Internet services generally would be expected among young adults. For the data in the Czech Republic, there is a problem in that the sources that do give data for the percentage of Internet users use radically different groups. Therefore, comparing

different sources is not straightforward. Fig. 9 shows graphically the issues involved in taking the two different data sets.

Clearly, the difference in age groups is due to the difference in the focus of the pieces of research. ČSÚ aims to give a dataset that gives an unweighted, non-focused cross-section of Czech society, whereas the WIP dataset is unashamedly pointed at giving a focused view of youth in an international cross-section. Clearly, this colours the data in a major way.

Figure 11 - Internet use (%) in the Czech Republic, age, 2005-2010



(L:ČSÚ, R:WIP)

However, despite the complications, one can see that there is a clear trend, as predicted in the hypothesis, for greater Internet use among the youngest of the population and very fast growth among the middle range of adults. This is unsurprising, as it is predicted from the literature on the subject.

The question of a transition to an information society in a situation where only the youngest in the the society exhibit the behaviour expected is an interesting one. Whilst, it is true that the society will change, it may take a generation or two to establish a true "information society" across society. Clearly, it is the task of policy to ensure that the transition is an smooth and rapid as possible. If we are to take ICT literacy as the conerstone of an information society (if not, then a digital society) then the desire to make ICTs more accessible to all must be a priority, otherwise it would only be a section of the society who engage with ICTs who could be part of such an information society.

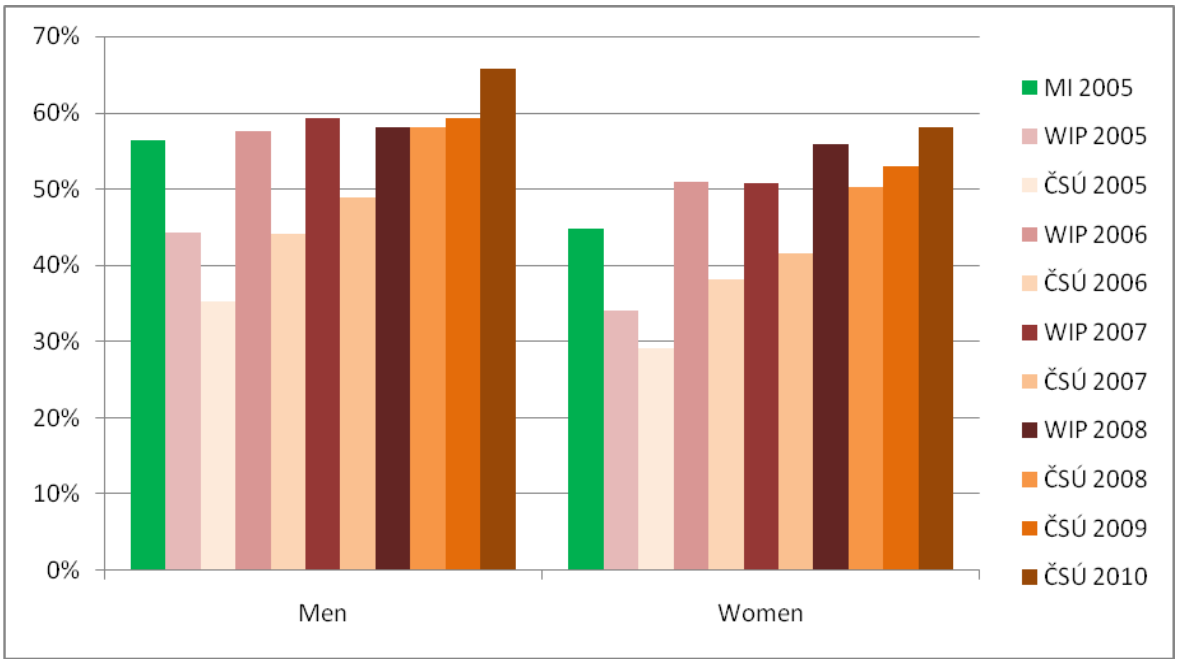
Both ČSÚ and WIP data show that younger adults are most likely to be Internet users and that the rate of increase in Internet users in the rest of the population, was still much lower than in young adults year-on-year. The groups "25-34"," 35-44", "45-54" (ČSÚ), "19-30" and "31-45" (WIP) show the highest rate of growth, however despite this high level of growth, the number of internet users in the older groups fail to reach similar levels to those of Internet users in the youngest groups. This shows the success of policies by the government to promote ICT literacy among students, however it also points to the problems with a lack of policies aimed at adult literacy. The WIP data, in particular points to a significant generation gap between the youngest members of Czech society and the oldest.

The generation gap has the potential to cause a rift in a society, if one is to believe that the information society is inevitable and that ICT use will be a significant component of people's interactions within such a society, then having an older generation which predominantly is not computer literate will cause a significant proportion of society to feel alienated and disconnected to society as a whole. That specific policy has not been formulated to prepare for this suggests either, a lack of foresight, or a lack of belief in the information society, or

perhaps, more worryingly, it may be a symptom of political apathy. More needs to be done to prepare all of society, as to date the social policies have been more aimed at preparing a new information economy for the next generation than providing social policies that help society as a whole. The lack of a coherent approach to address the problem of age-related alienation in society has led some (Jones, 2005; Fragoulis, Masson & Klenha, 2004) to criticise the strategy completely, naturally, social planning without regard for a potentially very important issue raises concerns about the priorities of the European Commission and the question of just how "social" information society really is.

6.2.2. Internet use and gender,

Figure 12 - Internet use in the Czech Republic, 2005-2010, gender



(ČSÚ, WIP, MI)

Above we can again see the discrepancy between reported figures from the MI, WIP and ČSÚ. Regardless, it is evident from the WIP and ČSÚ data that there is a significant

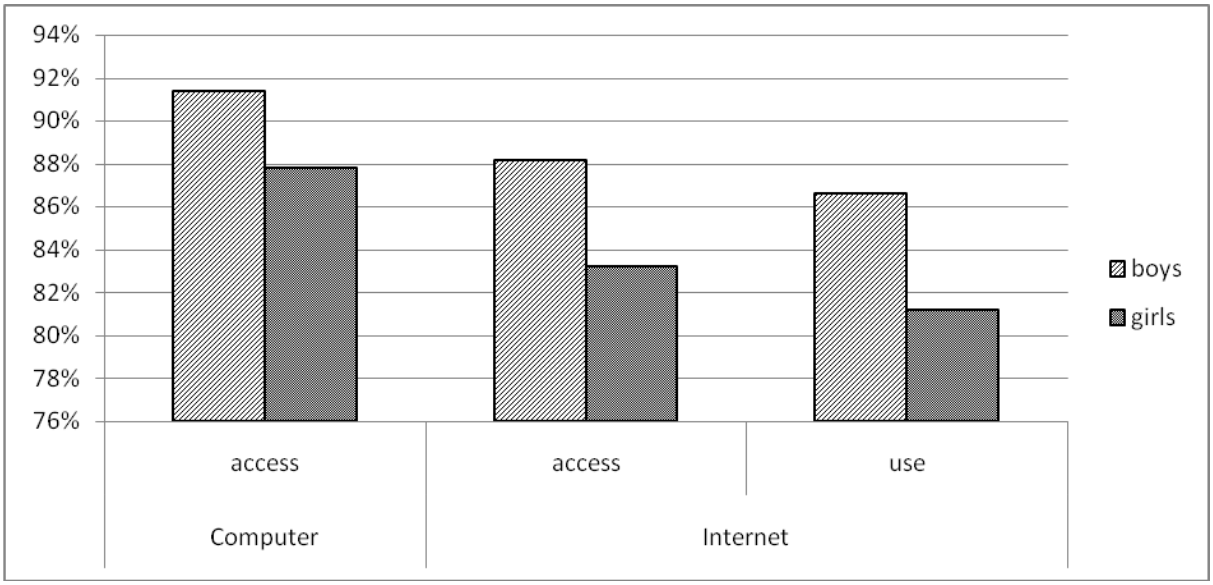
difference between Internet access among Czech men and women. This phenomenon has a tradition in Western society (Schumacher & Morahan-Martin, 2001), generally males tend to be more inclined towards using computer use and ICTs than females. In the WIP data the correlation is lower than the ČSÚ (fig. 13), albeit not significantly, so it is not clear whether the figures for men and women will, over time, come to meet for that data, clearly as there are so few years, extrapolating a projected trend would have little value. Regardless, it is a point of concern if access to ICTs does result in better literacy and, therefore, future employment prospects.

Figure 13 - Table of Internet use in the Czech Republic, gender, 2005-2010

	MI	WIP				
	2005	2005	2006	2007	2008	
Men	56.4%	44.2%	57.5%	59.3%	58.0%	
Women	44.8%	34.1%	50.9%	50.8%	55.9%	
Difference	11.6%	10.1%	6.6%	8.5%	2.1%	
			WIP	Correlation	0.95552	
	ČSÚ					
	2005	2006	2007	2008	2009	2010
Men	35.3%	44.1%	48.8%	58.0%	59.2%	65.8%
Women	29.1%	38.1%	41.5%	50.3%	52.9%	58.1%
Difference	6.2%	6.0%	7.3%	7.7%	6.3%	7.7%
				ČSÚ	Correlation	0.99847

Government policies have a target of 100% childhood computer literacy through education; however ČSÚ data suggest that there remains a difference to computer access in the home for Czech children aged 10-15 (fig. 14).

Figure 14 - ICT and Internet access and use among Czech children, 2nd quarter 2010



(ČSÚ)

The concern is that 5% fewer girls are using the Internet in the household than boys; in figures the 86.59% of boys that use the Internet at home equals approximately 250,700 children, whilst the 81.18% of girls equals 220,100 individuals. These may have an advantage in terms of employment in adulthood over the approximate 38,800 boys and 51,000 girls aged 10-15 who do not have the opportunity to use the Internet at home. For international comparison, South Korea was reported to have over 90% of teenagers and children using the Internet in 2001 (Lee and Chan-Olmsted, 2004). Clearly, for the Czech Republic to be among the highest performers in the world must be the goal.

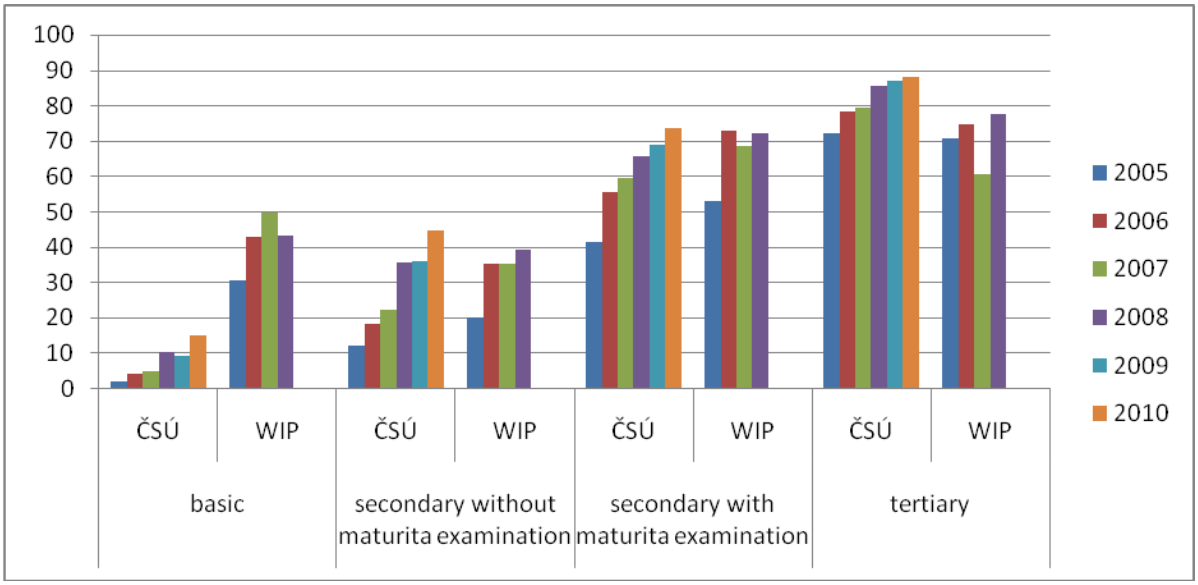
Quite what the reason why household access for girls is lower than boys is not immediately obvious, literature suggests that computerphobia is more prevalent among women (Weinberg and Fuerust, 1984; Brosnan and Davidson, 1994) although the exact reason behind that is still open to debate. The issues of greater levels of computer anxiety are clear, though, and due to the increasingly important role of ICTs in general life is something which should be

countered as effectively as possible to ensure that people can maximise on their opportunities. In the modern Czech Republic, ICTs have become a key part of life for a large section of society and computer literacy can make a significant difference to an individual's opportunities.

6.2.3. Internet use and education, employment and location

In section 1 it was established that the ČSÚ data for education and computer use suggested that the level of education of an individual was a very good indicator of computer use. The reason being that it provided four separate clades based upon the separation of "basic", "secondary without maturita", "secondary with maturita" and "tertiary". For internet use, the WIP statistics fall into broadly the same groups, but there is one significant difference that needs to be taken into account: the statistics from ČSÚ lists the completed education of people over the age of 25, whereas the WIP statistics list the completed education of *all* respondents. The result is that anyone under the age of 25 would not be included in the ČSÚ statistics, as they may only have passed the maturita but they are currently at university, but in the WIP statistics they would be included, dragging the average closer to that of people who have completed their university education. As such, there is a significant discrepancy between ČSÚ and WIP data, especially in the case of students who have only completed a basic level of education (fig. 14). The other groups are not as significantly affected and show much more similar figures.

Figure 15 - Internet use in the Czech Republic education,, 2005-2010



(ČSÚ, WIP)

It is interesting to show that in the WIP statistics the difference between individuals who passed the maturita and those who had a university education is very small.

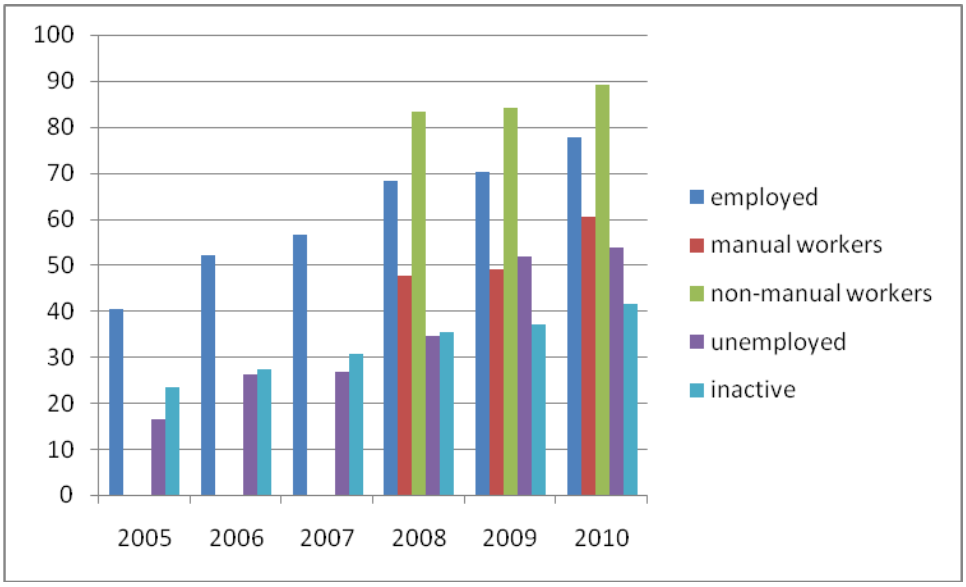
Figure 16 - Table of Internet use in the Czech Republic, higher education, 2005-2010

Year		Highest level of education achieved			
		vyšší odborné	VŠ - bakalářské	VŠ - magister	VŠ - doktorské
2005	Yes	70.0%	78.6%	67.4%	66.7%
	No	30.0%	21.4%	32.6%	33.3%
	Total	100.0%	100.0%	100.0%	100.0%
2006	Yes	77.8%	70.8%	77.2%	73.9%
	No	22.2%	29.2%	22.8%	26.1%
	Total	100.0%	100.0%	100.0%	100.0%
2007	Yes	42.9%	71.9%	81.4%	47.1%
	No	57.1%	28.1%	18.6%	52.9%
	Total	100.0%	100.0%	100.0%	100.0%
2008	Yes	92.3%	80.5%	79.8%	58.1%
	No	7.7%	19.5%	20.2%	41.9%
	Total	100.0%	100.0%	100.0%	100.0%

(WIP)

These data show a phenomenon that actually runs contrary to what one would expect. In this case the individuals with the highest levels of education actually show lower levels of basic computer use than those with “higher professional” (vyšší odborné) qualifications and bachelor degrees. This is likely a symptom, not of a flaw in the hypothesis, but, instead, of the differences in age found among people with university degrees. Generally, one would expect higher academics to be older than junior academics. As it is, the average for academics across the board is still higher than any other group and as it is in the most highly educated group and also non-manual workers, as is shown in fig. 16.

Figure 17 - Internet use in the Czech Republic, employment, 2005-2010



(ČSÚ)

The change in distribution of Internet use throughout the Czech Republic

Figure 18 - Table of Internet use in the Czech Republic, location, 2005-2010

Year		Size of municipality						Total
		≤999	1 000 – 1 999	2 000 – 4 999	5 000 – 19 999	20 000 – 90 000	>90 000	
		≤1 999		2 000-9 999	10 00-49 999	≥50 000		
2005	WIP	36.10%	35.00%	37.20%	41.10%	38.50%	42.00%	39.00%
2006	WIP	51.70%	50.90%	51.10%	54.80%	54.60%	57.30%	54.10%
2007	WIP	50.40%	55.30%	58.20%	50.00%	55.70%	58.40%	54.80%
2008	WIP	54.30%	53.00%	57.30%	53.80%	58.90%	60.80%	57.00%
2009	ČSÚ	50.50%		52.50%	55.90%	63.40%		55.90%
2010	ČSÚ	57.10%		60.50%	62.60%	66.80%		61.80%

When considering the decision to use the Internet at home, one of the first considerations must be how affordable it is for the household. As the most common method of accessing the Internet is through physical cables there are certain installation and maintenance costs associated with such a service. The cost is obviously mitigated in densely populated areas and more expensive in rural areas.

Evidently, there is a difference between large population centres and rural areas; however both the WIP and ČSÚ datasets show that the difference is not that great. Also, It is interesting to note that the difference between the most populous and least populous does not change significantly from year to year, showing that, for the most part, the Czech Republic is advancing at a similar rate. Clearly policies to make internet access universal across the Czech Republic have been successful and it is more important for new policies to build upon past successes than to try something new.

Of course, the Czech Republic is one of the smaller members of the EU and as such it will find it easier to update the infrastructure of telecoms, simply because the cost of expensive

products and services, such as servers and other ISP services, would require a serious overhaul less often than the need to replace fixed cables and telephony services[6].

As a smaller nation, the cost of maintaining a modern, cheap Internet service should be more affordable than for the larger EU states. Hence, we see similar growth across the board. It was expected that the rural and urban regions in the Czech Republic would have exhibited a greater difference than was the case; this shows that the policies to increase computer access throughout the Czech Republic have been effective in ensuring the availability of Internet access throughout the country.

6.3. Time spent using ICTs

The data for time spent using the Internet is some of the most telling, as it actually brings the analysis as close as possible to the concept of efficacy, as the time spent using ICTs and the Internet have a significant role in making individuals more comfortable using ICTs and more computer literate. The data provided by the WIP is for time spent using the Internet in a day over time from 2005 to 2008. The MI and ČSÚ data only provide single year's data, 2005 in the case of the MI, 2010 in the case ČSÚ.

[6] Consider the shift from dial-up, to ISDN, to ASDL and then finally to broadband and fibre optic services. All of these are expensive due to the cost of upgrading the cables to provide better service, whereas the central servers have remained fairly unchanged.

Figure 19 - Table of regularity of Internet use in Czech Republic, gender, 2005, 2010

		Male		Female	
		2005	2010	2005	2010
MI[7]	ČSÚ	MI	ČSÚ	MI	ČSÚ
Denně, téměř denně	Every day or almost every day	58.86%	66.56%	50.51%	62.20%
Několikrát týdně	1–4 days a week	29.37%	23.44%	32.74%	25.38%
1-4x měsíčně	At least once a month but not every week	9.05%	8.14%	12.36%	10.01%
Méně často	Less than once a month	2.71%	1.58%	4.39%	2.13%

The figures from the two sources do appear to show a change with people using the Internet on a more regular basis, although one must be hesitant to draw a clear conclusion from the data, as they are from different sources. However, if accurate, it would point to an increase in regular Internet use and, therefore, suggest a shift towards an information society. What we can find if we look at the relationship between education and regularity of Internet use in the same group is that the two sources show similar trends:

[7] It should be noted that there was not an English language translation of the MI data, as such the questions asked we published only in Czech. The categories are suitably close to be compared directly against the ČSÚ data.
Translation: "Daily, almost daily", "Several times a week", "1-4 times a month", "Less often"

Figure 20 - Table of regularity of Internet use in Czech Republic, education, 2005, 2010

		Basic		Secondary without maturita		Secondary with Maturita		Tertiary	
		2005	2010	2005	2010	2005	2010	2005	2010
MI[8]	ČSÚ	MI	ČSÚ	MI	ČSÚ	MI	ČSÚ	MI	ČSÚ
Denně, téměř denně	every day or almost every day	45.52 %	40.10 %	38.15 %	40.41 %	60.41 %	67.66 %	74.35 %	79.34 %
Několikrát týdně	1–4 days a week	38.24 %	34.03 %	37.83 %	36.40 %	28.55 %	24.03 %	19.89 %	16.45 %
1-4x měsíčně	at least once a month but not every week	12.18 %	20.68 %	17.90 %	18.25 %	8.58 %	7.46 %	3.87 %	3.62 %
Méně často	less than once a month	4.06 %	5.18 %	6.13 %	4.52 %	2.46 %	0.84 %	1.89 %	-

As would be expected from the literature, the most highly educated individuals use the Internet on the most common basis and the individuals who had gone into tertiary education and those who passed the maturita exam do exhibit much higher figures for daily Internet use. Note that, again, the differences in the reporting system the ČSÚ has for education means that the figures in the basic category are especially distorted from the other sources.

While this data is valuable for understanding how regularly people do use the Internet, table 9 shows that there is a clear difference that must be drawn between how often the Internet is used at home and often the Internet is used generally. For the social analyst, the data for domestic Internet use would be invaluable as currently the data shows the difference between highly educated individuals who may use the Internet on a daily, or nearly daily, basis in the

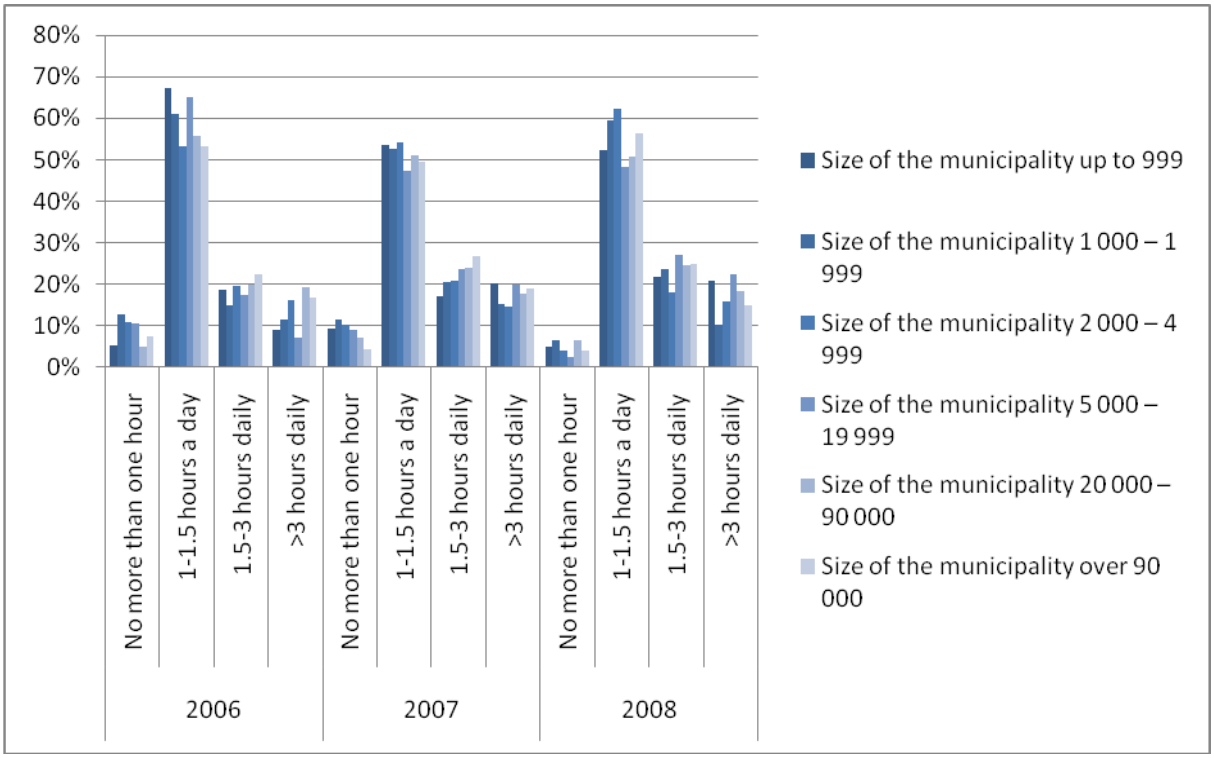
[8] See footnote 7, fig. 19 for notes on the use of Czech for the MI data.

workplace, whereas the poorly educated individuals will not have jobs which would allow them to use the Internet whilst in the workplace. That, in itself, is no surprise and is not important information to impart. What would be more significant would be if one could compare the difference between domestic and workplace use in the same groups. In that situation, it would balance out the "office job" bias and actually focus on the social aspect of "information society". By giving figures solely for the one without the other – in this case it may be argued that domestic use is actually the more important of the figures – one receives half of the information needed to discuss society in any meaningful way.

6.3.1. WIP data in details

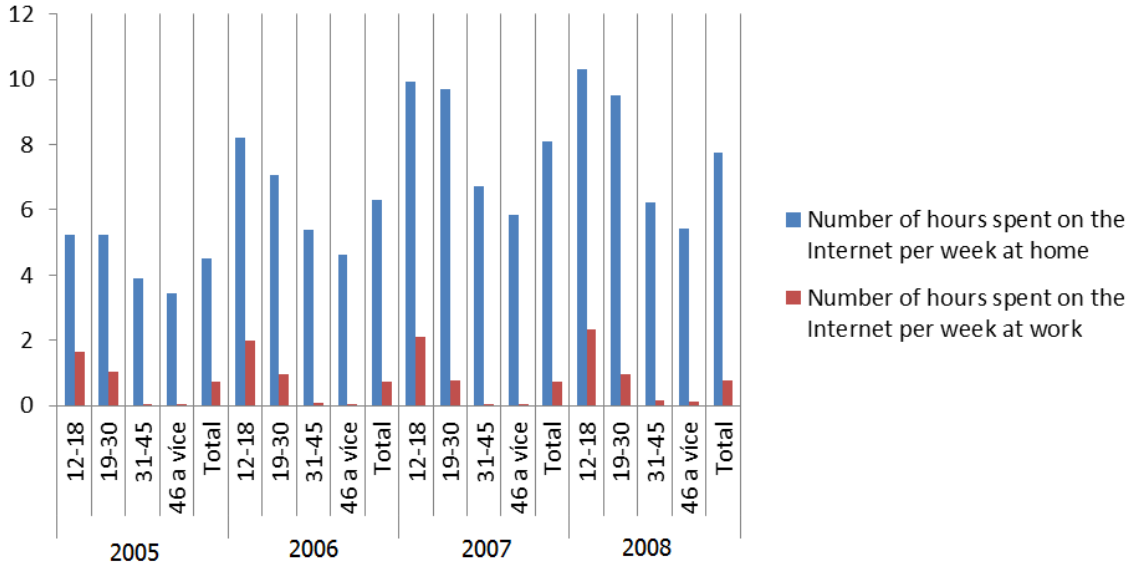
The most accurate picture of change comes from the WIP data, which provide four consecutive years of data for each variable, allowing the ability to plot change over time.

Figure 21 - regularity of Internet use in the Czech Republic, 2006-2008



(WIP)

Figure 22 - Frequency of Internet use in the Czech Republic, average, location, 2005-2010



(WIP)

The first and most obvious fact is that the vast majority of internet users are not using the Internet more than one and a half hours daily, regardless of where they are in the Czech Republic. Whilst there is more use among individuals from larger population centres, the difference is not actually that great, as can be seen in table 10 (appendix), the standard deviation is approximately twice that of the mean average of the number of hours.

Also worthy of note is the huge discrepancy between domestic and workplace Internet use. The average Czech spent approximately 400% more time online at home in 2005, 550% more in 2006, 700% in 2007 and 2008 according to the statistics taken. Interestingly, the average time spent online at work did not change in a major way for any of the groups, at approximately one hour per week.

Figure 23 - Average time spent using Internet in the Czech Republic, gender, 2005-2008

		Number of hours spent on the Internet per week at home	Number of hours spent on the Internet per week at work
2005	Male	5.4702	.7421
	Female	3.3573	.7438
2006	Male	7.2946	.7009
	Female	5.2314	.7542
2007	Male	9.4578	.8723
	Female	6.6102	.5950
2008	Male	8.5146	.8050
	Female	7.0518	.7565

(WIP)

Again, one can find a pattern suggesting that the average male should exhibit higher computer literacy; in this case they are spending more time online on average at home, but both women and men are spending similar amounts of time on the Internet in the workplace. This is what one would expect from Ware and Stuck's (1985) analysis in the 1980s, however in the last two decades the Internet has become a significantly less phallocentric space, as is evidenced by the higher figures for Internet use than reported by Ware and Stuck and also by the closing gap between the figures for male and female Internet use. This is promising, if only because it will make the Internet are more varied and therefore "complete" environment as it increasingly represents the interests of a greater demographic of people.

It may be worthy of study to see how the "Web 2.0" and "Information Revolution", proposed by digital media theorists and digital ethnologists since the dot com bubble burst, has affected the sexual and gender diversity found on the Internet, as one of the central themes of Web 2.0 in particular is user-generated content – as evidenced by services like *YouTube* having an enormous number of unique visitors. In such a situation where the technical expertise required in order to generate content allows for an environment in which every user can produce content, rather than a numerically small "elite" of programmers.

Figure 24 - Table of average time spent on the Internet in the Czech Republic, location, 2005-2008

		Number of hours spent on the Internet per week at home	Number of hours spent on the Internet per week at work			Number of hours spent on the Internet per week at home	Number of hours spent on the Internet per week at work
2005	Basic education uncomplete	4.8779	1.5191	2007	Basic education uncomplete	7.2058	1.7118
	Basic education	6.1989	1.5574		Basic education	12.1635	2.0645
	Secondary without maturita	4.3996	.1453		Secondary without maturita	7.6910	.1633
	Secondary with maturita	3.5504	.5567		Secondary with maturita	6.9085	.3031
	higher professional	3.2143	.0000		higher professional	7.6667	.0000
	University - BA, BSC…	4.3182	1.3636		University - BA, BSC…	9.8696	1.5725
	University - MA, MSc…	4.0704	.0000		University - MA, MSc…	6.4219	.2004
	University - PhD	2.1250	.6250		University - PhD	8.4375	.0000
	Do not know, no answer	11.3333	.0000	2008	Basic education uncomplete	8.8426	2.0400
2006	Basic education uncomplete	8.0484	1.5916		Basic education	9.9098	1.9635
	Basic education	7.6069	1.7729		Secondary without maturita	6.1924	.1407
	Secondary without maturita	6.3889	.2015		Secondary with maturita	7.3334	.6123
	Secondary with maturita	5.4377	.5243		higher professional	9.3234	.2157
	higher professional	4.0000	.0000		University - BA, BSC…	12.8502	1.7185
	University - BA, BSC…	4.8529	1.1324		University - MA, MSc…	7.8871	.1856
	University - MA, MSc…	5.8249	.1698		University - PhD	8.8338	.0585
	University - PhD	4.4510	.0000				

(WIP)

Little change occurred in the three-year-period 2006-2008 as far as the amount of time people from different occupation spent on the Internet, or at least the change that occurred cannot be shown to fit a particular trend. This is most likely due to the few years involved in the study.

This finding is not necessarily something that one would expect, everything else has suggested that Internet usage is going up in a clear way and individuals generally are using ICTs and the Internet more often, however the statistics from the WIP makes that seem less likely. This may be because the data only covers a few years, but the statistics for hours spent on the Internet for all groups suggests that Internet use has not changed significantly. In those groups where it has increased there may have been a 200% increase but, the actual figures remain very low. Also, as the increase has been shown to take place almost entirely in the domestic setting, questions are raised about whether any serious changes are occurring in the economy. The Lisbon Strategy expected the information society and the information economy to come hand-in-hand; however in truth there is some evidence that the Internet and ICTs are becoming commonplace and more valued in the home, but it has not translated significantly to any differences in the workplace. Obviously, one cannot use a single measure for a theoretically connected subject to dismiss another, more broader subject, but the problem is that there is not significant evidence to suggest that the information economy is anymore real a situation in the Czech Republic now than ten years ago. For example, the balance of manual to non-manual labour employment in the Czech Republic has not changed significantly since EU accession. The circumstantial evidence to dismiss the possibility of a true information economy existing in the Czech Republic gains credence in the absence of concrete or circumstantial evidence to suggest any real change.

6.4. Online activity

The ČSÚ dataset provides information of the types of activities that people engage in online. In itself it is quite interesting to give a snapshot of how people interacted with the online world at a single point in time (in this case, 2nd quarter 2010); however, for this analysis it is more important to see how different demographics engage in different activities.

6.4.1. Communication

On the Internet, email is king; it has an almost ubiquitous role, in that all groups show extremely high figures (greater than 80%). Considering that the first reason the Internet came into existence was in order to send communication from computer to computer, it is no great surprise that email has become the most important activity for people the world over.

There is some variation between groups, for example 79.9% of people who completed secondary education, but did not take the maturita, used the Internet to send emails in the 2nd quarter of 2010, but 96.5% of individuals with a tertiary education reported to have used email. Even so, that 79.9% of individuals is the minimum figure shows the massive importance of email.

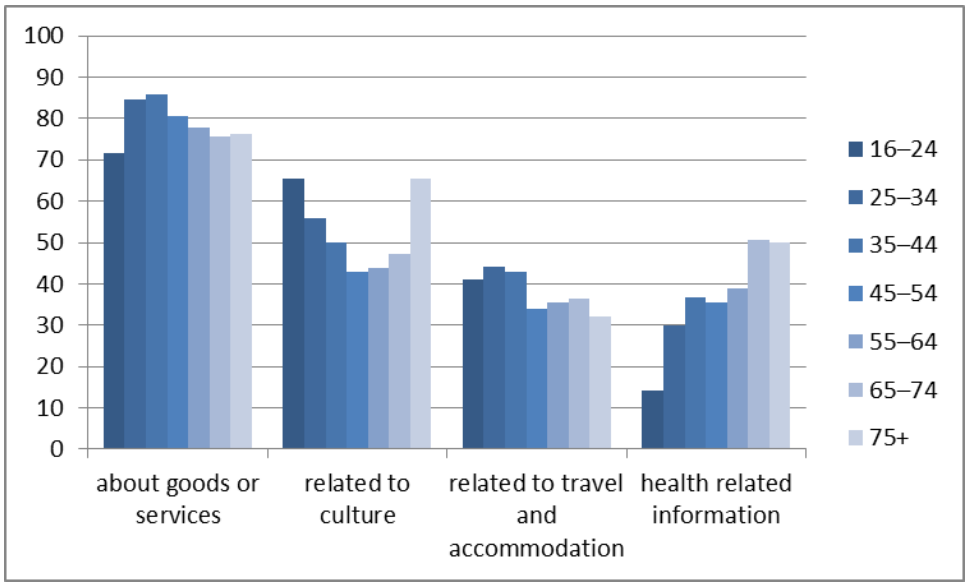
Internet telephony, on the other hand, is a much newer possibility and that shows in the amount of individuals who use the Internet to make telephone calls. 41% of respondents had made a telephone call over the Internet. The highest performing groups were students (62.6%) and inactive people (51.2%) – students would be expected to be most computer literate and it is not a great surprise that inactive people are a high performing group, as one would expect a greater proportion of the inactive population to have physical disabilities; in

which case, the ability to communicate as freely as the Internet can offer would be advantageous. The same groups also perform well on statistics for video calling. This is an example of how computer literacy can really allow people to change their lives and to create opportunities that reduces the inequalities between able-bodied and differently-abled individuals.

Chat, discussion forums, social networking and blogging are activities for the young, in each of these cases, the figures are very low but they are highest among the youngest groups. The age groups "16-24", "25-34" and students consistently exhibit higher figures across the gamut of online communication.

6.4.2. Information search

Figure 25 - Online activities in the Czech Republic, information search, 2nd quarter 2010



(ČSÚ)

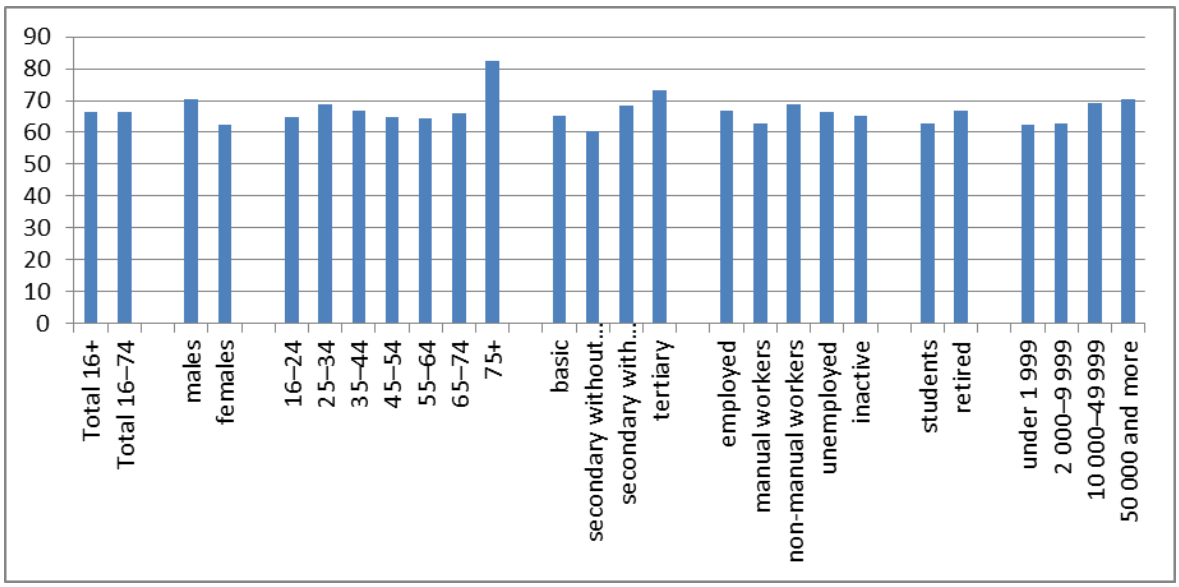
The picture for the types of information searches online is much more promising. In this case, we see that there is no simple "younger-more, older-less" trend; instead, we find that different types of Internet search take place in different groups. This is promising for the information

society as in the information society one would expect people to engage with what they are interested in; that the youngest adults are not the largest group in every category is exactly one would expect in the case of an information society, as it reflects the concerns individuals from different strata of society, rather than reflecting greater Internet awareness.

6.4.3. Selected online services

The ČSÚ chose to collect data for four unrelated activities: "reading online news, newspapers, and news magazines", "looking for a job or sending job application", "Internet banking", and "selling of goods or services". The aim of which is to provide an overview of Internet use across society. The most noteworthy categories of which are the former two: "reading online news, newspapers, and news magazines" and "looking for a job or sending a job application.

Figure 26 - Online activities in the Czech Republic, Selected Online services, 2nd quarter2010



(ČSÚ)

The data for accessing news services shows a very similar level of use throughout Czech society. Although, figures for accessing news services are not as high as email, it is clear that for the majority of Internet users the Internet is seen as a reliable source of information and news. That it is common to users throughout society suggests that a very basic level of Internet literacy or awareness is necessary for people to use the Internet to access news.

This does support the basic theory behind the theories of information society that, given the situation which is unique to the Internet, individuals are inclined to create and consume information and news, in particular. The question of whether the people seeking information online are engaging in an essentially new practice, or if finding the information online is essentially the same activity is important. The theory behind the information society is that because of the wealth of information, there will be a transformation in the way society works and the way people act and think, due to people learning to work with information as a basic skill. Naturally, this is not the type of subject matter which lends easily to statistical analysis; as such, specific work must be done to establish a way to verify this theory in a scientific way for very large numbers of people. The statistics currently available are simply not applicable to the question of cognitive changes.

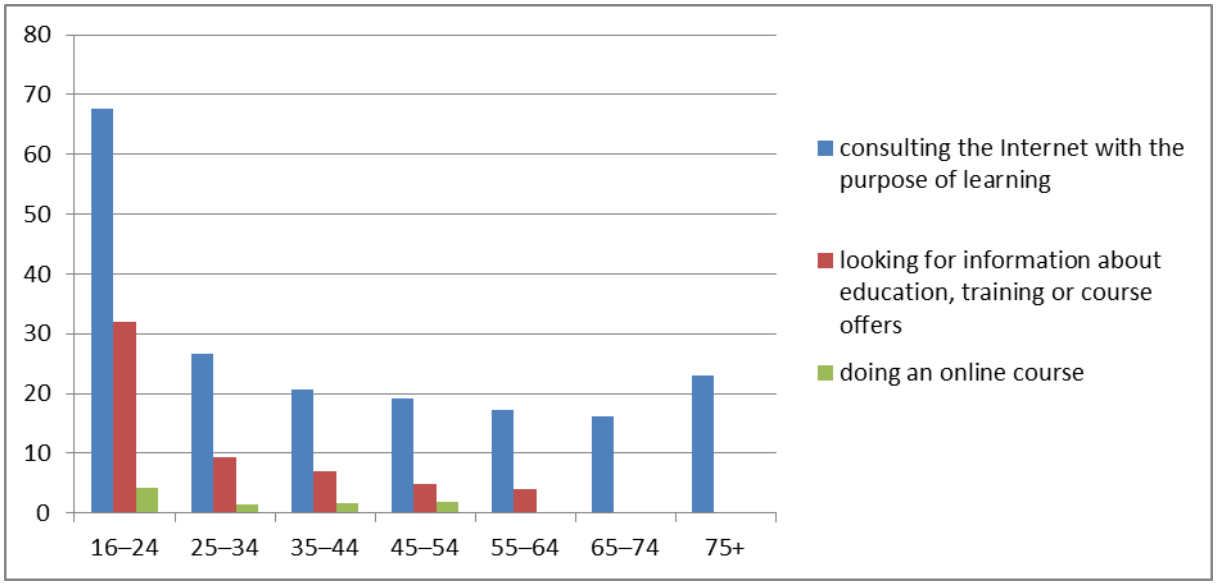
Understandably, for the majority of the population job seeking is not a priority activity, the main group to engage in the activity is unemployed individuals, of whom 80.3% had used the Internet in the quarter to seek or apply for a job. If one looks at the general population and examines how job seeking varies according to age one can see the now-familiar pattern, of younger adults using a wider variety of Internet services than older adults. Comparing according to age is flawed in that the figures for unemployment and job seeking more

generally are not published with the data, meaning that it is hard to make concrete comparisons, as it may be the case that more young adults are unemployed, or simply show greater levels of job dissatisfaction, making them wish to seek new work generally. Similarly, fewer people with a tertiary level of education job seek online than with a basic level of education. This runs contrary to everything else that has been established to date.

Without the context behind this data, one must be cautious to make conclusions. This problem is found throughout the data for ICTs; because measuring social change is actually what analysts wish to be involved in, there is a push to measure social phenomena statistically. This practice is a good one, more information cannot be a bad thing when making analysis, but taking information without context can be potentially misleading. The problem, therefore, for the analyst is the lack of context for many of the statistics. Some, such as employment statistics, can be given context by seeking it specifically – as they tend to be collected for other reviews – however some simply cannot, such as seeking information: finding data for something which essentially has the same core principle, but does not take place on the Internet can be very difficult. Even in those cases where statistics *are* collected there is no reason to believe that the same statistical methods are used, that the same questions are answered, or that the same goals are present in two separate reviews of similar subjects.

6.4.4. Training and education

Figure 27 - Online activities in the Czech Republic, training and education, 2nd quarter 2010



In many ways, training and education online could be seen to be the epitome of the information society. It establishes the principle that learning can take place regardless of location, in most cases regardless of the differences in time zones between student and teacher, in some cases the courses available are free of charge, sometimes paid. Similarly, despite the currently low figures for the numbers of individuals engaging in education online, there is no reason to believe that online education could come to surpass regular "on campus" education for the tertiary sector in a matter of decades. However, this has not come to pass yet, evidently, as fewer than 105,000 individuals in the Czech Republic have engaged in doing an online course. This may be due to the primary language for course available being in the English language, however this is not likely to be the determining factor, instead it is due to the simple fact that online learning is still its *naissance*, although there have been distance learning options in Western Europe since the 1960s, it has often not been a cheap option and remains on the periphery of people's awareness of the education sector. Should

the distance learning sector grow and competition increase, one would expect distance learning online to become a more important feature of the educational sector as a whole.

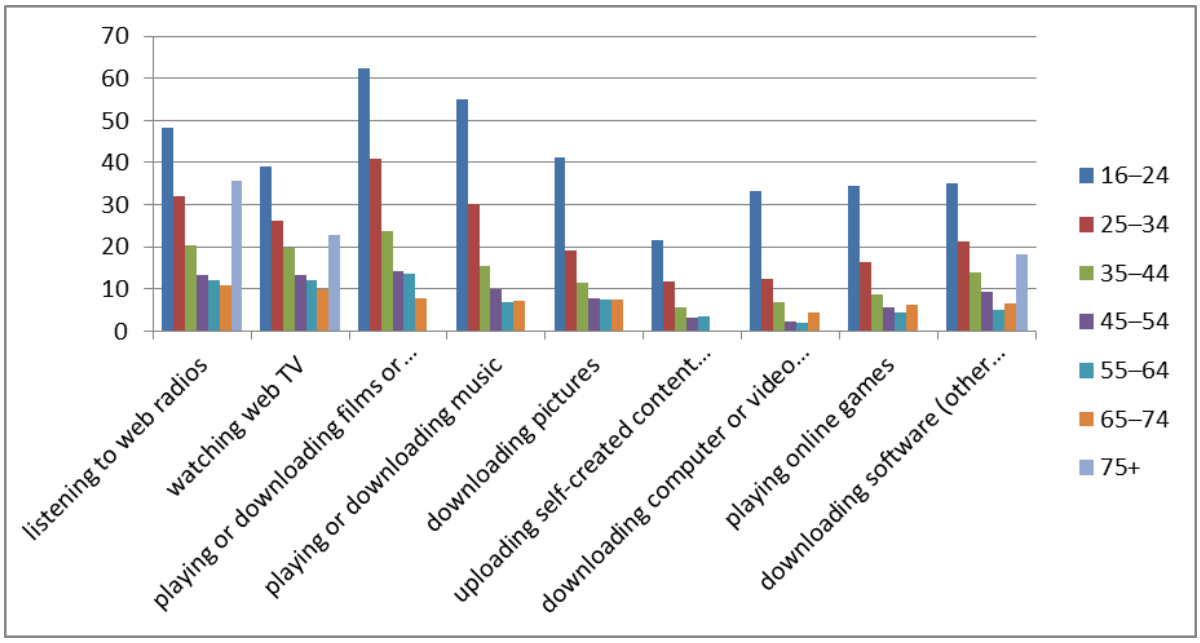
Although online courses have not yet been taken to with the enthusiasm that some would hope, there is clearly interest in education online, again this shows the association in people's minds between the Internet and information, which is promising for the concept of the information society. Simply because people are seeking information online, however, does not prove that the nature of society has changed significantly, it simply means that the primary source of information has changed. Considering the changes in citizen's advice with the rising popularity of the telephone and television in the 20th Century and the rise of the Internet at the turn of the millennium, it is difficult to see how exactly each change could be considered socially altering on one hand, or how the Internet in particular represents a significant social change from the former technologies of the 20th Century in this respect.

6.4.5. Entertainment

Throughout the online entertainment sector there is one rule: the youngest members of society are both most likely to enjoy a variety of entertainment activities and also, more young people enjoy each of those activities. This is a prime example of how the Internet is a predominantly young medium in certain respects. The majority of online games are aimed specifically at teens and young adults, for example. However, it would be unfair to suggest that all entertainment online can only be enjoyed by young adults; online television is generally either exactly the same content as has already been broadcast or one can find content produced for the online environment which is similar in format to that found offline.

The data presented in fig. 16 shows that online entertainment is still primarily enjoyed by young adults.

Figure 28 - Online activities in the Czech Republic, entertainment, 2nd quarter 2010



(ČSÚ)

Fig. 16 and entertainment provide the best single image which is shorthand for the nature of the internet in society. The most varied activities are engaged in by young adults, older individuals generally have significantly lower levels of variation in their online activities. According the literature, the more people do a variety of activities with ICTs the greater their literacy – and therefore their range. (Howard, Murphy and Thomas 1986)

While basic ICT skills are increasingly becoming common throughout society, the next level, advanced skills, is still dominated by the young and well-educated. This is the level which is going to be able to truly transform the economy. In a situation where policies have failed to make Europe stand out in the world for basic computer literacy, it may be able to capitalise on high levels of education generally – as part of the developed world – to maximise more on

the literacy there already is to gain an economic advantage. Also, in order to stimulate any growth at all, the workforce will have to be able to manipulate information which obviously requires high levels of ICT literacy.

7. CONCLUSIONS

That the Lisbon Strategy failed was not a surprise to anybody, not really, for the politicians who championed it – of which there were few – it was little more than a *cause célèbre,* but for the political establishment as a whole it was not worthy of mention (Charlemagne 2010). The question asked by journalists was, *"Do Europeans want a dynamic economy?"*, but instead the question should have been, "Do Europeans care about the information society?" or perhaps, "does *anyone* care?" The whole façade was not one of changing Europe, but a façade of concern, instead it is clear that politicians throughout the EU were apathetic, the policies they made which fitted to the guidelines of the Lisbon Strategy were incidental to the strategy itself.

In the Czech Republic it is clear that regional development has succeeded: Moravians, Silesians and Bohemians are equally likely to have a computer in their household. While Prague remains higher in terms of Internet use and computer use, that is more likely due to the disparity in earning potential in the capital, which results in a greater number of highly educated Czechs in Prague. Whilst, the regions outside of Prague should be encouraged to grow to meet the same standards of living as in the Capital, it is also a priority to maximise the opportunities in the Capital itself. The fact that the other regions in the Czech Republic are beginning to show an increasingly similar level in quality of life is not unexpected, it has

been the trend of the modern Czech state as it has become increasingly Westernised and wealthy since the Velvet revolution.

Also, one must remember that the improvements to infrastructure needed to enable greater availability of the Internet and broadband in particular are things which the Czech Republic can be confident of achieving, as it is more affordable in smaller countries to make such services available in more remote regions. One needs simply to build, dig or landscape the country's hinterland in order to get cables to the most remote regions. If one were to compare that to the larger countries in the EU, such as Germany or France then the cost is significantly different. Similarly, if compared to Poland, due to the slower process of Westernisation, the cost of infrastructure will be relatively higher still than in the Czech Republic. That is not to belittle the effort; it was a surprise to see how much progress some regions have made, Olomouc region in particular is an example of a region that in 2005 was being left behind, but by 2009 was one of the mid-range regions for Internet and computer use. The argument is, however, that these improvements would have been made regardless of the Lisbon Strategy. The strategy whilst recommending that countries do so made no difference to whether or not they would.

Essentially, this is the problem that the European Commission and the Lisbon Strategy and those like it have had. No governments took a serious concern in what they said. The reason for that is because it was a unified strategy for a serious of member states with no carrot and no stick. In some of the member states – the Czech Republic and the United Kingdom in particular – there is a hesitance to simply "follow suit" on what the other members were doing. On the subject matter of regional development of ICTs the EU has never really exerted

any control, it has always been left to domestic politics and so the Lisbon Strategy meant nothing. Essentially it was whistling in the wind.

In the Czech Republic in particular it was found that the hypothesis was mostly correct:

Age does make a significant difference to whether or not someone uses an ICT, or uses the Internet. More of the youngest individuals in society use ICTs and they use them more, both more regularly and for more time. While older adults do use ICTs more often than they *did* some groups, especially those over the age of 45 are showing little increase in the amount of ICT use. Adult learning in the Czech Republic, which a number of authors have made a serious case for focusing upon (Dyck, Gee and Smither 1998, Gilroy and Desai 1986, Jones 2005), has been disregarded. This has been a common story in all of Europe, leading some to ask where the Strategy was going from early on (Jones 2005).

The most highly educated in society are still the most likely to use a computer. Though there are some with more prestigious academic titles who are not ICT users, they are numerically outweighed by the students of bachelor's degrees and higher professional qualifications, the former of which will ultimately become the PhD students in universities. The Czech Republic, and Europe generally, needs to tackle this in order to give every citizen the right to maximise on their own potential. The policies of most member states have tackled the long-term issues of children in disadvantaged circumstances having limited access to a computer by ensuring free access to ICTs and the Internet in schools and public institutions, but as stated before, more needs to be done for the current workforce now, if the Czech Republic wants to enable growth in the foreseeable future.

The goals of the Lisbon Strategy were unlikely to have been met, by the Czech Republic, as it had a later entry to the EU along with many of the former communist states, but the outlook for Europe 2020 based on what has been achieved for far is not good. With the economic troubles which began in 2007 and look like they will continue well into 2012 and perhaps beyond, public funding for ICT development has been put on a hold throughout Europe. In a situation where budgets are becoming increasingly scrutinised both domestically and internationally there simply is not the political will to make Europe 2020 happen. Perhaps that will change and it may be possible to meet the targets by the 2020 deadline despite the slow start, but in truth the apathy towards the Lisbon Strategy is likely to only breed more apathy towards Europe 2020; the economic crisis is just another reason to add to the case for not dealing with the issues.

A political sea change will have to take place in the political will towards ICT development before one is likely to see any serious change to adopt the guidelines of Europe 2020.

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APPENDIX

	Size of municipality		Number of hours per week online - at home	Number of hours online per week - at work		Size of municipality		Number of hours per week online - at home	Number of hours online per week - at work
2005	Under 999	Mean	3.9799	.9100	2007	Under 999	Mean	8.4102	1.1260
		Std. Deviation	5.92789	2.04169			Std. Deviation	11.90814	3.11970
	1 000 – 1 999	Mean	4.5833	1.3900		1 000 – 1 999	Mean	6.4551	1.2212
		Std. Deviation	6.73816	3.45826			Std. Deviation	8.66060	3.35555
	2 000 – 4 999	Mean	3.9740	.8852		2 000 – 4 999	Mean	7.3542	.4870
		Std. Deviation	6.85278	1.56895			Std. Deviation	8.51913	1.66057
	5 000 – 19 999	Mean	5.4524	.6246		5 000 – 19 999	Mean	8.6936	.8981
		Std. Deviation	8.57906	1.68127			Std. Deviation	12.16581	3.01890
	20 000 – 90 000	Mean	4.8340	.6772		20 000 – 90 000	Mean	9.4014	.5157
		Std. Deviation	8.30683	1.30119			Std. Deviation	12.00531	1.52476
	Over 90 000	Mean	3.9942	.5190		Over 90 000	Mean	7.3211	.5708
		Std. Deviation	6.04601	1.32844			Std. Deviation	8.57417	1.74795
	Total	Mean	4.4901	.7412		Total	Mean	8.0571	.7425
		Std. Deviation	7.19553	1.80868			Std. Deviation	10.50526	2.36339
2006	Under 999	Mean	5.2867	.8085	2008	Under 999	Mean	8.0247	.9715
		Std. Deviation	6.48235	2.07466			Std. Deviation	10.00118	2.84517
	1 000 – 1 999	Mean	5.2477	.7912		1 000 – 1 999	Mean	5.5172	.7837
		Std. Deviation	7.87424	2.58261			Std. Deviation	5.65999	2.14703
	2 000 – 4 999	Mean	6.1839	1.0772		2 000 – 4 999	Mean	7.7957	.6782
		Std. Deviation	9.05324	3.12061			Std. Deviation	10.19275	1.60915
	5 000 – 19 999	Mean	4.9133	.5196		5 000 – 19 999	Mean	8.4193	.9260
		Std. Deviation	6.49485	1.80825			Std. Deviation	10.77558	3.22092
	20 000 – 90 000	Mean	8.8491	.8142		20 000 – 90 000	Mean	8.2077	.4056
		Std. Deviation	11.98581	2.00479			Std. Deviation	10.06167	1.30015
	Over 90 000	Mean	6.0820	.5960		Over 90 000	Mean	8.4946	.8897
		Std. Deviation	8.19433	1.77528			Std. Deviation	9.43578	3.91582
	Total	Mean	6.2689	.7252		Total	Mean	7.7693	.7795
		Std. Deviation	8.81551	2.12381			Std. Deviation	9.30042	2.50944