Ágnes Urbán

Department of Media and Telecommunication
Supervisor: Mihály Gálik

Corvinus University of Budapest
Ph.D. Programme in Business Administration

The market of new media services

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Author: Ágnes Viktória Urbán

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1. Introduction

In recent years, a large number of media economics researches focused on the market of the so-called new media or new electronic media. As maybe suggested by the expression itself, the directions and the borders of this field of research are rather hard to determine, it is not such an exactly defined medium as traditional radio or television was. From a rather sloppy yet very pragmatic approach, new media consists of the media services introduced to the market as a result of recent years' technological development. A more specific definition may also be formulated, of course: in my interpretation, new media is the totality of those mass communication devices and services which allow of the interactivity of services and the personalisation of media content.

The introduction of digital television, the increasing availability of interactive services and the Internet are becoming more and more common. It markedly reflects the extremely high rate of technological development and the revolution in consumer habits. In the last decade new services became available to wide masses although they were previously said to be futuristic and only appeared in sci-fi writers' fantasies rather than academic analyses.

The dissertation examines the market environment of the services provided by the new media, with special attention to the change in consumers' habits. This paper, however, does not at all or only to an inevitable extent deal with the economic issues of the traditional television industry and the more widely interpreted media industry. The same applies to the details of technological development and technical matters, on one hand because it is a very complex topic, on the other hand because the author is rather unfamiliar with the technical approach. Out of the limelight are regulatory matters, as well, even though their analysis would be absolutely relevant and particularly interesting; however, that topic is diverse enough to provide a subject for several dissertations in itself. Consequently, regulatory matters are only discussed to a limited extent in this paper.

The significance of a state and a governmental *policy* is emphasized several times, as it is a cornerstone of research into the new media. An initiative and effective policy may become a basic driving force of the spreading of infocommunication technologies, ensuring that development serves long-term socio-political interests

rather than short-term commercial ones. Correcting market failures, ensuring technological neutrality, preventing the emergence of a digital divide – or at least mitigating its effects – are all tasks to be solved by a well-constructed and flexible policy concept which adapts to changes in the environment.

First of all, the relevance of the research will be discussed to show that the market of services provided by the new media is worth investigating because of both its social and economic impacts (Chapter 2). Next the industry environment is presented with special consideration of economic and business effects of the changes. The convergence process and the establishment of new infrastructures create the framework for the appearance and the development of new media (Chapter 3).

The theoretical background of the paper is built upon two different yet interrelated approaches. One of them is interactive television, getting more and more attention in media literature, which have not yet been described in detail in Hungarian (Chapter 4). Besides defining interactivity and presenting relevant applications, a description of business processes and an analysis of changes in consumer habits are also provided. I will attempt to prove that online and digital video services may be substitutes to each other, as different providers' offers become more and more overlapping. Neither do the business models differ as much as one might think at first sight: often there is a correspondence between actors of the two markets – Internet vs. digital television.

In Chapter 5 the other theoretical approach applied is the diffusion theory of Rogers (2003) describing the market penetration rate of innovations, the different phases of consumer acceptance. It is briefly summarized what available research results suggest about the limitations and differences in applying the diffusion theory to the new media.

An important note is that most of the examples discussed in the dissertation being based on European cases is not a coincidence but rather an intentional choice. The reason behind is that in North America the standards followed tend to be substantially different (e.g. concerning digital television), infrastructure is much more developed and usage habits do also significantly differ. The results of a Hungarian empirical research would be rather hard to interpret given such a theoretical environment, thus I mainly focused on European processes.

The Chapter 6 introduces the Hungarian market of interactive services, or at least the segments I considered to be important concerning the analysis. From amongst Internet access variants, only broadband connections are considered. The narrowband (telephone modem) access which is prevalent for the time being, yet only offers a limited range of services is irrelevant to the topic. Neither is mobile technology included in the investigation, though it is considered to be one of the key devices of interactive media use by many. Yet the effective application of mobile phones in mass communication is enabled by the introduction of third generation (UMTS) services in 2005, while content development and market penetration are expected to follow even later than that.

Subsequently the research question and the hypotheses are formulated and the applied methodology is introduced. Hypotheses basically concern the characteristics of the present users of broadband technologies, thus innovators and early adopters. The research question investigates whether the subscribers of broadband services in the early period of market penetration constitute a homogeneous group or contrariwise, different types of users can be identified.

The empirical research (Chapter 7) was completed amongst the subscribers of the broadband services (*chello*) of the cable company UPC. The electronically distributed questionnaire survey was completed between April 22 and June 28, 2004. Altogether 48,011 users were approached by the 35 questions, while the sample consists of 9,771 persons. Data were processed by SPSS.

The questions dealt with Internet usage, demographical characteristics, media consumption habits and penetration of ICT (information and communication technologies). It must be noted that questions on Internet usage were aimed at the features of the Internet as a mass medium rather than a communication tool.

Results confirmed that consumer composition in this early stage of the market penetration of broadband technologies expressly differs from the average. The typical consumer is male, young, has a higher education degree and works in a high position, or is still studying and mainly, they are inhabitants of the country's capital. Broadband subscribers are much more active newspaper readers than the average, while considering television channels the popularity of thematic channels is conspicuous.

The research revealed that different user groups could be distinguished based on Internet usage variables. These groups do markedly differ considering their demographical characteristics, media consumption habits and the penetration of ICT. Yet there are differences in their first encounter with the Internet and the type of their first home Internet access, as well. These findings may be used in the development of a policy; they may facilitate our understanding of how the innovators and early adopters of a technology get to know a new product or service.

Last but not least, it is important to mention that the dissertation was prepared at the Department of Media and Telecommunication at the Faculty of Business Administration of Corvinus University of Budapest. This topic is a highlighted item in the department's professional portfolio; we also participated in the DVB-T project investigating the possibility of introducing digital terrestrial broadcasting in Hungary. As part of the project, a series of studies were written on the international market and regulatory environment of digital television. The paper makes use of the experiences and main findings of these researches, as well.

2. Relevance of the research topic

Today television is the most significant medium considering its global incidence, its impact on people's everyday life and its business value, as well. The first decades were characterised by limited supply models (state/public, commercial and the so-called dual), which meant a limited number of channels, and programmes of a rather general nature (Gálik, 2003). Yet with the spreading of cable and satellite broadcasting, multichannel model appeared on developed markets by the nineties. From a technological perspective, that is the time when frequency scarcity, the barrier to the development of the television market was eliminated. From a market approach, the time had come to increase supply and widen the choice.

However multichannel models did not only bring about a wider choice of channels, but changed industrial structure, too. Diminishing geographical borders opened new dimensions considering economies of scale, as the expansion of the potential market enabled channels serving much more fragmented groups. So the fragmentation of the market started, offering thematic channels became a typical strategy for providers. These so-called *niche*-channels could only be introduced through cable and satellite broadcasting, since for the long-run survival of such channels it is essential to eliminate geographical borders and to expand the targeted customer group.

By the beginning of the new millenium, a previously unimaginable variety of thematic channels was on offer. Besides the early yet still popular types (sports, documentary, music, children's, movie, etc. channels), specialisation became usual even within the existing categories; e.g. in the sports segment, channels focusing on football or even extreme sports have appeared, while in the documentary segment, separate channels are offered to those interested in history or in nature films. An apparent phenomenon in developed television markets is the fall in the market share of general channels along with an increase in the time people spend viewing thematic channels. Terminology refers to this as *narrowcasting*: in contrast to the well-known concept of *broadcasting*, this expression means that the strategy of a channel is based on establishing smaller target groups and fragmenting the audience.

Nevertheless, the increasing number of channels and a wider variety of choice is only one aspect of the development of television, or that of the more widely interpreted electronic media. Possibly less extensive, but at least as radical as the process

mentioned above is the change in viewers' behaviour caused by the spreading of the so-called interactive services. Concerning television, digital technology is necessary to launch personalisation. In the most developed countries, the conversion to digital technology had started in the nineties, by the end of 2003 already 23 percent of all households in the European Union – consisting of 15 countries that time – took advantage of digital broadcasting. Digital television platforms, as well as the definition of interactivity and the types of services will be discussed in more detail later on.

The development of electronic media in the nineties was not limited to the television industry, the most spectacular improvements took place in another field. As a matter of fact, it was the Internet penetrating the market that set off radical changes, leading to a revolution in media consumption habits and also to the development of a new economic structure in more developed countries.

By the beginning of the 21st century it had become apparent that the Internet was going to turn into something much more significant than what had been expected by many. Academic researchers' access to databases, the availability of information and the different forms of interpersonal and intergroup communication (e.g. email, chat, forums) are still important, yet today they are not the only reason for the popularity of computer networks. It has become evident that for some part of the public the main appeal is entertainment content, more specifically the download of music and video files and the personalisation of media content.

Yet the lack of an appropriate infrastructure and the high costs of its establishment constitute a barrier to satisfying market demand. Even in the most developed countries, the broadband infrastructure needed to download video and music files is not available everywhere, and even if it is, high subscription fees prevent a fast expansion of the consumer market. Considering the supply side, however, it is essential to achieve a certain number of subscriptions, the so-called critical mass, which ensures the return of infrastructural investments and decreases the risk in Internet content development at the same time.

Thus for the time being, supply and demand are expanding parallelly in the broadband Internet market, but it is not known whether the types of content available today will be sufficient for the technology to become widespread. It is also possible

that a less expensive technology with a higher added value (e.g. third generation mobile phones) will be introduced even before the above mentioned services could penetrate the market. The only thing we can be sure of is that some of the consumers do already use broadband Internet thus they have become the innovators and the early adopters of the new technology.

One of the objectives of the European Union and national governments is to spread the use of the Internet, more specifically the broadband infrastructure. On one hand this is a factor enhancing competitiveness, on the other hand it may facilitate the bridging of the ever-growing digital divide present in developed societies. Though there are debates on possible forms of government participation and their efficiency, it is unquestionable that in recent years the establishment of an information society has become a priority in the majority of the developed countries.

By now, one may state that as a result of technological development, inter-sectoral competition in the media market is increasing. One field of competition is that of the different technologies, since the platforms of digital television (cable, satellite, terrestrial) and broadband Internet are competitors both in the consumer market and in governmental policy-making. Yet besides the competition between technologies, that between the contents is becoming more and more fierce, too. By now consumers are able to follow their own preferences in developed media markets, thus personalisation seems to have gained a foothold in this industry, as well. As a consequence of the infocommunication revolution the consumption of electronic media products, listening to the radio or watching television has acquired a new meaning. It seems now the industry soon will be facing the most comprehensive series of changes it has ever seen.

3. The new media

3.1 The infocommunication revolution

Besides the establishment of the infrastructure, the 'Access America' programme developed in the United States in 1993 also prioritised content development and the improvement of the ability to use it. It was at the Access America Introduction by Al Gore that the Vice President held his famous speech introducing the expressions *Information Superhighway* and *Global Information Infrastructure* to the public. The Vice President emphasised the importance of establishing the e-government, first by content development and second, by working out the different subsidy systems (Bognár-Fehér-Varga, 1998).

Soon, the European Union answered the American challenge with the so-called Bangemann report in the summer of 1994. The report already used the expression information society, and realised that information technology and communication constitute the basis for a modern economy. The process how digital technology (compression, storage, transmission) changes the social and personal relationships of people was described as a revolution. The complexity of the report is indicated by the fact that it summarised all main matters which would become the main questions in the new economy, including the development of infrastructure, the establishment of contents and services (e.g. telework, e-learning, e-government, intelligent city) and expected changes in audiovisual markets (Bognár-Fehér-Varga, 1998).

Since the Bangemann report, the European Union has been paying special attention to the changes we call infocommunication revolution. Strategies aiming at the establishment of an information society and at bridging the so-called digital divide evolving as a consequence of social inequalities are worked out one after the other at a national level, too, besides those prepared by the EU. The currently applicable EU strategic material is titled eEurope and establishes the most important tasks in this field until 2005. The action plan eEurope focuses on two closely interrelated topics: on one hand, on the development of services, applications and contents concerning both public services and e-business, on the other on the infrastructure and security services necessary for their operation. Possibly the most forward-looking element of this material aiming at the improvement of EU competitiveness is that in infrastructure development. It prefers *broadband* networks to *narrowband* access,

which is much more widespread yet only enables a limited range of applications (CEC, 2002).

The evolution of an information society and the priority of this field is indicated by the fact that more and more countries establish new dedicated ministries or expand the authority of existing ones. Classification in public administration is rather diverse: the field may belong to the Ministry of Science, Technology and Innovation (Denmark), the Ministry of Transport and Communication (Finland), the Ministry of Industry, Employment and Communications (Sweden) or the Ministry of Informatics and Communications (Hungary).

There were several attempts to incorporate the infocommunication revolution into the process of economic development. The standard work of Alvin Toffler from 1980 investigates the expected features of a so-called third wave following the thousand-year-long agricultural revolution and the 300-year-long industrial revolution. He did not use the term infocommunication revolution yet, but he did quote expressions coined by other authors like information society, electronic world and global village. The uniqueness of Toffler's twenty-five years old work is that by applying a multi-disciplinary approach he could give a surprisingly precise description of the main social, political and economic changes the infocommunication revolution has caused and will probably be causing in the future (Toffler, 2001).

Wirtz (1999) examined a shorter period of time, and stated that the evolution of the information society fits well into the Kondratiev cycle. The birth of the steam engine (around 1800), the rise of the railways and the steel industry (around 1850), the appearance of electricity and the chemical industry (around 1900) and the spreading of molecular biology and the automobile industry (around 1950) were all important steps in the development of the industrial society. Even though the Kondratiev cycle seems to have accelerated with the transition from the industrial to the information society, the boost in the spreading of information technology and the Internet (in the nineteen-nineties) fits well into the previously observed cyclic pattern of economic life.

Thus it can be stated that the appearance and spreading of information technologies started fundamental economic and social changes. A single disseration is unsuitable for an all-comprehensive presentation of these changes, their effects reach far beyond

the media industry. However one may be sure that the information society is going to be one of the foci of forthcoming years' or decades' research activities.

3.2 Convergence

The term convergence stands for the process during which the integration of media, communication and information technology started in the nineties, with the previously sharp boundaries between these industries fading away. The word convergence was first used by the European Committee – as related to the development of new media – in 1997 in the so-called Green Book. The Committee distinguishes four levels of convergence (CEC, 1997):

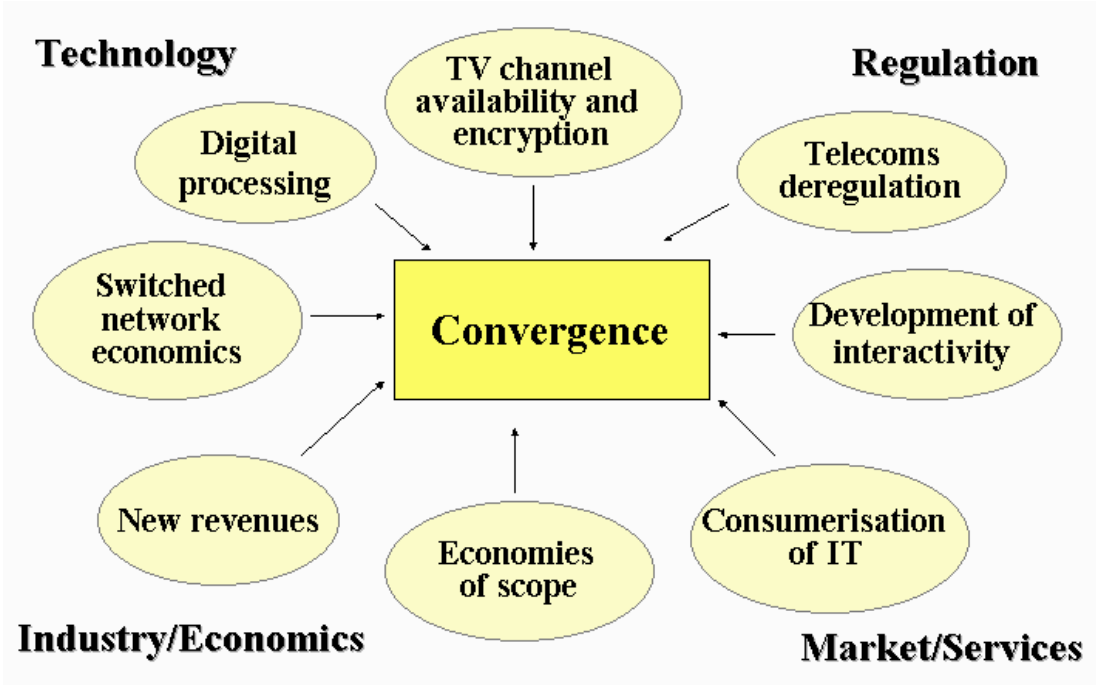
1) technology and network platforms (different platforms' ability to provide similar services)
2) industry alliances and mergers (horizontal and vertical integration)
3) services and markets (new services are born as a result of inter-sectoral cooperation)
4) *policy* and regulation (competition rules, technological neutrality)

The Green Book also mentions the convergence of equipment, which is a spectacular improvement for consumers, its realisation, however, proceeds much slower than expected by many in the mid-nineties.

There are approaches different from the categorisation of the European Union, as well, emphasising some other aspects of convergence. Horst Stipp, a director of American television network NBC underlines the importance of the changes in consumer habits besides the technological approach and intra-industrial mergers mentioned above. According to Stipp, the purchase of interactive services, the changes in the previously passive consumption habits is the most important element of convergence (Stipp, 1999).

The below figure of the consultant firm KPMG demonstrates the complexity of the convergence process very well (*Figure 1*). The role of the business and regulatory environment and consumer habits must be underlined just as well as that of technology.

Figure 1: *Drivers of convergence*



Source: KPMG

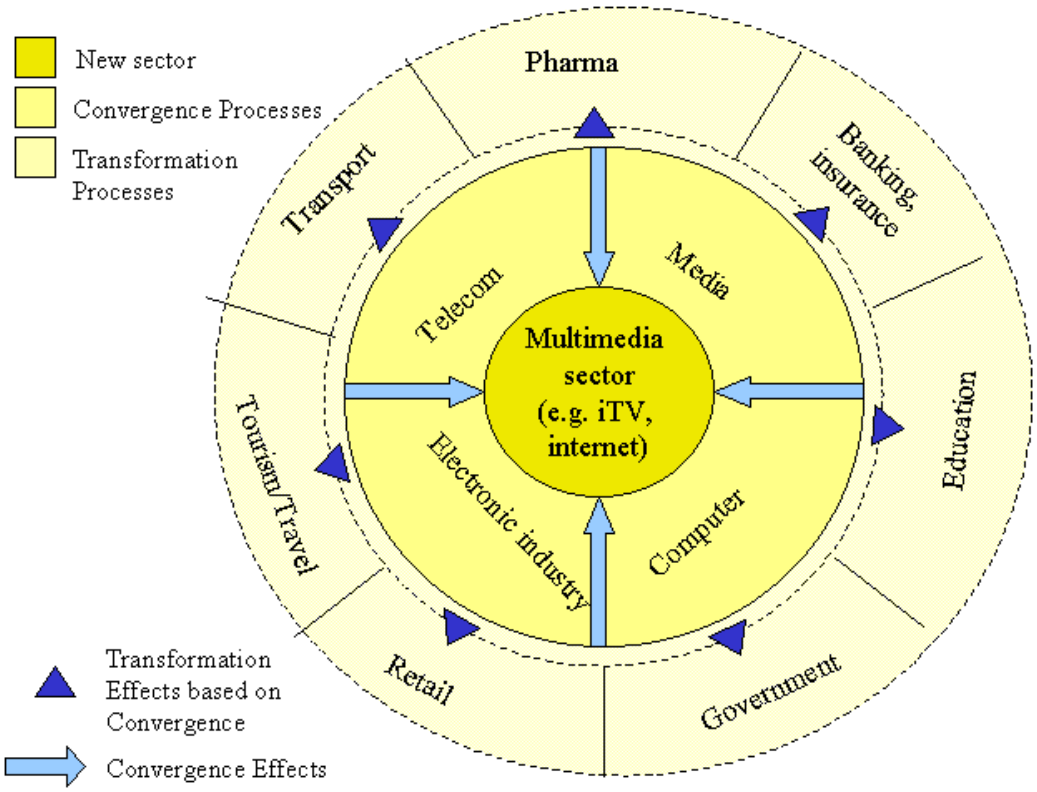
One of the most apparent manifestations of convergence is a series of horizontal and vertical integrations. These expressions have not been unknown to the media industry, as integration has always been one of the ways to achieve economies of scale and scope. Horizontal integrations are mergers within the same market (by fusion or by acquisition). They assist in achieving economies of scale and in increasing the company's business value through its global presence. Vertical integrations, on the contrary, mean that the media company's ownership is extended to various segments of production and distribution (e.g. a movie studio acquires a cinema chain or a newspaper publisher owns a printing house). This enables a single company to appear in every element of the value chain, thereby maximising profits on the enterprise level.

The value chain of new media services is much more complex than that of the traditional media industry. Due to this fact and the globalisation process taking place in the world economy, the significance of horizontal and vertical integrations has seriously increased. As a result, several companies altered their strategic focus and extended their operation to new branches, which often lead to the evolution of a new

core competence. In the telecom industry the risk coming from the changing environment is even more considerable than in other sectors. Telecom companies have enjoyed their status as regulated, protected companies for decades. At the end of nineties they face with the double threat of deregulation and rapid technological change. It is hard to change, conducting business as usual is always much easier. (Ghemawat-Ghadar, 2000). It is quite sure that the recession by which the communication industry was hit at the beginning of the decade was partly caused by this situation. In order to emerge from the recession and reduce their debts, some telecommunication companies started to sell their newly established branches.

Wirtz (1999) described the main impacts of convergence in the so-called ring model (*Figure 2.*). The model distinguishes between three types of sectors (core ring, middle ring and periphery ring) according to the impact convergence has on them. The core ring represents the emergence of a completely new industry, thus the birth of a new market. Yet because of the strong substitution effect the core ring has a cannibalisation effect on the middle ring, that is on the industries from which it originates. The changes taking place in the core and the middle ring induce a transformation effect in the periphery ring, too, reforming practically the whole economy. Kruse (2002) points out that new communication technologies were even able to change the economic and social environment of horse racing, an industry believed to be an absolutely traditional one.

Figure 2: *Convergence ring model*



Source: Wirtz, 1999, p16

The development of technologies and the convergence process did not only change corporate strategies but the structure of the industry, as well. An expressive example is the case of telecommunication enterprises vs. cable companies, which had been providing their subscribers with substantially different services: telecommunication facilitated inter-personal communication, while cable networks were used for television broadcasting. Yet thanks to the Internet these have become competing platforms by now, since both technologies are suitable for providing broadband Internet access. Today, broadband infrastructures are seen to be spreading worldwide, with cable and ADSL *(Asymmetric Digital Subscriber Line)* access being the main competitors.

Due to the technological transformations, the redefinition of complementary and substitute goods or services became necessary. Until the end of the eighties cable and satellite broadcasting had been complementaries: television signals were transmitted to the cable headends by satellites, while the link between those and the subscribers

was the cable network. However the drop in the size and the price of satellite dishes enabled consumers to buy an own device, and as a consequence, the two technologies can now substitute each other. The offer of digital satellite broadcasters and cable provides is particularly similar, thus these two platforms are direct competitors in some geographical markets.

Convergence between television and the Internet may be *competitive* or *complementary*. Competitive convergence exists between industries producing products and services substituting each other, where existing functions are offered in a „bundle" (substitute paradigm, 1+1=1). This type of convergence is typically created by fusions and acquisitions. Complementary convergence, on the contrary, stands for a cooperation of industries with differing resources and competences, which leads to the creation of new functions besides already existing ones (cooperative paradigm, 1+1=3). This is often realised through strategic partnerships, and an extended market of this kind ensures better growth opportunities for the participants than the markets of the individual industries (Chan-Olmsted – Kang, 2003).

There are serious disputes on the future of convergence. According to a well-known saying, convergence has become one of the most expensive words in the world, partly because of some less successful fusions in the industry (Gálik, 2003). The majority of respondents in a survey amongst industry experts definitely expressed scepticism about the fusion of television and Internet. One of the most important findings of the survey was that technological convergence is not equal to, and does not mean, social convergence or a fusion in the daily use of media concerned (Van Dijk – De Vos, 2001).

Now, in the fall of 2004, when writing this paper, it would be rather difficult to predict the future of convergence. It is quite sure, however, that the products and services that convergence created do have a reason for existence in the market, as they started irrevocable changes in affected industries. Nevertheless, the persistence of the business processes and strategic turns induced by convergence is still a question mark. It is widely known that there were some mega-mergers in North America thought to be expressly unsuccessful, like the AOL Time Warner fusion establishing a symbolic marriage between traditional and new media. Here, the Internet service provider AOL having emerged from scratch in a couple of years

acquired one of the most powerful media empires in the US. After some years spent heavily in the red, the failure of the merger was admitted. The conglomerate was practically divided into pieces, or at least the AOL business unit was separated (in the fall of 2003 even the name AOL was abandoned, the company is now called Time Warner again).

The failure of the so-called *dotcom* companies representing the new technology undoubtedly slowed down convergence, the process of industries' integration. Dotcom enterprises' share of the infocommunication sector, however, was by far smaller than what could have justified a financial downturn of such an extent (Fülöp-Major, 2004). Thus the crisis of the entire infocommunication sector could not be ascribed to merely the unexpected success of the Internet and a few years later alteration of relevant expectations. It had rather diverse reasons, and it was more than just the financial crisis of dotcom companies. By way of illustration, the entire European communication industry lost 48% of its market value by December 2000 as compared to March 2000, and practically slid into a debt trap (Goff, 2002). From that time on these companies have kept on selling the businesses they had acquired in previous years one after the other. Apparently the sector managed to break the debt spiral, and after the years of crisis management the development is once again the main focus of their strategy.

3.3 The dawn of new technologies

3.3.1 Broadband services

It is widely known that the idea of the Internet had already been born by the sixties. Military and defence interests of the United States necessitated an information network less vulnerable to external attacks thanks to its decentralised nature. Later on, the concept was transferred to the academic field, as a connection between various scientific databases, libraries created an enormous knowledge base. That time Internet was by far not as user-friendly as today, a breakthrough in this field was achieved by the appearance of the World Wide Web. The nineties was the era of commercial applications, and the decade witnessed a rapid growth in the number of private users. The Internet, having emerged from scratch and achieving spectacular successes within a couple of years has not only changed the life of consumers but

also started far-reaching processes in international business life by creating the dotcom bubble and the bursting of that later on.

For a long period, the development of a country's Internet market was measured exclusively in terms of the number of users or the number of households attached to the net. Yet by now, besides these purely quantitative measures the type of Internet subscription (ratio of broadband subscriptions) it is also considered important, and government development programmes tend to focus on that index more and more. The reason is that broadband networks offer an opportunity to provide e-learning and e-government services, and the conditions for telework can also be ensured. The social utility of these will probably not be underestimate, but since a wide choice of entertainment content is also available through this infrastructure, business actors and consumers also have a vested interest in the establishment of broadband infrastructures. To illustrate this, simply consider that in Hungary, since December 2004 it is possible to download and view motion pictures. The broadband subscribers of the Matáv-owned Axelero are granted access to a digital video rental store, from which they may choose movies that suit their own preferences, and view them on a computer monitor or a television set.

Defining broadband infrastructure is not very simple, as the concept of broadband is changing with the development of technologies and with the speed of data transmission systems. OECD expects at least 256 Kbps and 128 Kbps for downloading and uploading respectively, while other organisations prefer different values (Umino, 2002). Instead of technical definitions, a dynamic approach of broadband access is gaining ground, according to which broadband infrastructures are characterised by speed, permanent availability and the opportunity to access the services consumers consider important. Since this last „condition" is also changing rapidly due to changes in consumer habits, it is quite obvious that international organisations' strategic materials do not bother much to numerically define the transmission capacity of broadband infrastructures.

The two most widely known types of broadband networks are digital subscriber lines (ADSL) and cable networks. From a business approach, these two technologies are competing in Europe. Some other technologies do exist, they are however in a very early stage of their development. Such alternatives include fiber optic cables and wireless, satellite and mobile access.

A major advantage of broadband networks is thought to be that its high speed ensures a more positive Internet-experience for the user, motivating them to try some more and more applications. E-commerce, e-learning, e-health, e-government and the access to various entertainment content is usually mentioned amongst the most significant applications. An important aspect is that broadband access may stimulate economic activity that may improve competitiveness both on the individual and the community level (e.g. in the case of a region).

The establishment of a broadband infrastructure and the spreading of services offered through that infrastructure has an economic weight, and it is a kind of incentive for the governments to create a development-stimulating policy. A primary reason for a policy is that even though broadband technologies are in an early stage of their development, it is already apparent that it will be impossible to render broadband services to everyone on business grounds. All over the world, providers are only interested in network development in densely populated areas, as returns are rather uncertain elsewhere. Yet for the evolution of an information society and for the bridging of the digital divide this technology must be available to the widest possible layer. Moreover, from a socio-political point of view the provision of infrastructures is extremely important in those areas which are the least valuable in business terms.

Governments have a two-fold task. Demand, on the one part, must be encouraged; people must be acquainted with the advantages of broadband services and the impacts of the changes resulting from its gaining ground. On the other part, the development of the supply side is also important; the stimulation of competition (especially that between technologies) as that could, on its own, encourage the development of the broadband market.

A peculiar regulatory dilemma may arise regarding that the spreading of broadband access as a purpose and the strengthening of competition as a tool may conflict with each other. The leading telecommunication provider may have a key role in establishing the infrastructure, as its solid capital base and market knowledge enables a relatively fast broadband infrastructure development – at least in the areas where it is profitable to do so. However this may lead to the market leader further strengthening its position, and thereby weakening competition in the long run and lengthening the time needed to achieve full broadband availability.

There are several tools at governments' disposal to encourage the spreading of broadband access. First, a competition-strengthening, investment-supporting and stable regulatory environment must be established. Besides, governments may in some way participate in the development of broadband infrastructure. This is something more than creating a competition-intensifying, favourable regulatory environment – this is called proactive behaviour. One means may be direct intervention, that is participation in the establishment of infrastructure, yet only in areas where private enterprises will surely not make any investments. A more refined solution may be the application of indirect tools in government policies. These may include:

- demand incentives (tax allowances);
- *public-private partnerships* (PPP), that is common investments by the private and the public sector;
- supporting the market entry of private consortiums where the development of infrastructures is not profitable enough.

Looking at the practice in various countries, there are several kinds of policies. One of them says that governments must not intervene in the market; market forces are enough for the development of broadband networks to take place. Another alternative accepts the necessity of government action, either through building the infrastructure or through subsidies to the businesses investing in the technology. An additional factor is that besides the state government, local municipalities may also develop a policy on the establishment of broadband infrastructures. It has become apparent that broadband services open up new business opportunities, improve productivity thus altogether they improve the competitiveness of the region.

In the majority of developed countries it is now widely accepted that the establishment of broadband infrastructures and the development of their services is essential in order to facilitate the evolution of an information society. Government programmes were adopted in a number of countries like Norway *(Action Plan on Broadband Communication)* and France *(France in the Information Society),* just to mention a couple of examples. Nevertheless one must not forget that investing in broadband networks is a profitable business in densely populated areas, primarily because of the attractiveness of entertainment contents. Thus broadband

infrastructures are being established even in countries, like Hungary, where a supporting governmental programme is only in an early stage of development.

3.3.2 Digital television (DTV)

The evolution of digital television was enabled by the appearance of new signal compression and signal transmission technologies in the 1990s. The digital technology was first available in studios in the programme production, and by now also in programme broadcasting systems.

Digital technology itself had appeared earlier in television (just think of teletext), yet the complete digitalisation of television transmission was not made possible for a long time. A pan-European industry-wide association called DVB *(Digital Video Broadcasting)* was established, which worked out a uniform standard for digital transmission. Thus DVB is a suite of standards for digital video and audio compression, treating terrestrial (DVB-T), cable (DVB-C) and satellite (DVB-S) broadcasting separately (Antenna Hungária Rt, 2002).

The success of DVB may be facilitated by the fact that there is no need to buy a new television set, the price of which is still very high, but it is enough to buy a so-called *set-top-box* suitable for signal decoding. This device may be attached to any television set thus enables the viewing of digital channels at a much lower cost. The prices of various manufacturers' set-top-box devices vary in a very wide range. At the time when this paper was written, the cheapest set-top-box in the UK market cost about EUR 90, while the most expensive one several hundred euros.

One of the main advantages – also apprehended by consumers – of digital television is an *increase in the number of television channels*. Thus all three platforms of digital broadcasting realise the multichannel model. The value added is smaller in the case of cable and satellite broadcasting, as these platforms allow of the transmission of dozens of channels even with analogue broadcasting. Yet in the case of terrestrial broadcasting, this change is a revolutionary one. Thanks to efficient signal compression, an entire digital multiplex of some 4-6 channels may be broadcasted instead of a single analogue frequency. This means that in areas where only two or three channels were available through terrestrial broadcasting, the introduction of digital broadcasting increases the number of channels to 10-15.

Further value added by digital television is a well-perceptible improvement in *video and sound quality*, which is a significant appeal for consumers. Crystal clear picture and CD-quality sound may dramatically increase the pleasure of watching television in the case of some programme types (music and sports events, motion pictures).

Considering terrestrial digital television, one has to emphasise *mobility*, which – in contrast to cable and satellite broadcasting – enables consumers to view their favourite channels when travelling.

The most important advantage of digital television, however, are still *interactive services*, which are a completely new experience to consumers. The details of interactive television are discussed in chapter 4.3, here I would like to provide only a very short overview of the most important services of digital television.

Concerning programme-related services, we have to underline the *pay-per-view* (*PPV*) service, which is especially popular in the case of motion pictures and sports events. It means that consumers may individually buy the content they are interested in, while the bill is settled electronically of course.

The opportunity to choose one's favourite camera angles during live broadcasts (e.g. sports) ensures a higher degree of editing freedom for consumers. The viewing of complementary textual information and statistics on the screen may be particularly appealing during sports broadcasts, too.

Interactive television also features voting and betting services. These may be related to any programme type, yet sports programmes, quizzes and reality shows are certainly going to be the most significant fields of applications of this type.

Already operating DTV platforms make extensive use of *Electronic Programme Guides* (*EPG*). Using EPG consumers may easily and quickly gather information concerning the programmes offered by various channels. With the number of channels increasing, the transparency of programme choice is becoming more and more important; viewers may search amongst programmes not only by channel but by time, genre, actor, or even by movie director, as well.

From amongst non-programme related interactive services, the opportunity to pursue *t-commerce* should be emphasised, which includes the merchandise of any products or services that may be bought trough digital television platforms. At least as promising as t-commerce is the possibility of completing banking transactions or

using e-learning or e-government services. The most forward standards of digital television provide access to the Internet, too, and all its services, like for example e-mailing. Consumers may also find games attractive, where they may play against each other or „against" the service provider.

Experience so far has showed that concerning the digital television platforms, those services tend to be the most popular which give way to individual preferences, to a higher-level personal choice, besides providing a significantly wider range of channels. Though Internet service provision through television networks is technically feasible, there was no real market breakthrough so far, the reason for which surely resides in consumer habits (see chapter 5.1). Thus we may state that as far as practical applications are concerned, digital television is a kind of transition between the previously mentioned multichannel model of analogue television and the cyber model of network media.

It is worth to provide an overview of the role of the state concerning digital television, too. In recent years' Europe, the cable and satellite platforms of digital television were developed on business grounds merely; the state was only involved in the establishment of the general regulatory environment. In the cable market, some companies (e.g. UPC, NTL) are heavily indebted since at the time being, incomes from digital services are unable to cover the enormous costs of the digitalisation of cable systems. In the case of satellite market, the investment needed is much smaller, yet the operator may support the consumer side, for example by assuming the cost of set-top-box. UK satellite provider BSkyB followed this strategy, in order to facilitate a rapid spreading of its services. It is getting more and more apparent that a single national market is unable to „host" more than one satellite provider, as costs are not only incurred in purchasing hardware but also in buying content. It may only be covered if a sufficiently wide subscriber base exists. (The competition authority of the European Committee approved the fusion of two digital satellite providers both in Spain and in Italy. Earlier, providers had been making losses in both countries, thus it became obvious that a profitable operation is impossible without combining the subscriber bases, without achieving an efficient size.)

The terrestrial platform of DTV entered a somewhat different development path. The transition from analogue to digital broadcasting (termed *switchover*) is not feasible without state support. This would not be a problem on its own as the country's

frequency pool is a part of the national wealth, thus making a more efficient use of it will macroeconomically increase social welfare. Yet the fact that standardisation issues could not be settled in recent years is a problem indeed. Various conditional access systems and application interfaces fragment the slowly developing digital television markets, which situation can probably only be cured by stronger regulatory intervention. DVB Group managed to standardise DVB-T successfully in the middle of the nineties, yet the standard they proposed for multimedia and interactive services (DVB-MHP, *Multimedia Home Platform)* is rather far from being introduced in most of the states, and materially conflicts with the interests of the majority of existing actors in the market (BKÁE..., 2002a).

The lack of uniform standards is not the only problem with digital terrestrial television: for the time being, a successful business model has not been found. Experiences in countries which have already introduced DVB-T services are not too positive, in two of them (United Kingdom, Spain) the companies providing the service on business grounds went bankrupt, while in the countries with more extensive state support (Sweden, Finland) the number of users lags far behind expectations. By now, it has become apparent that the state must not participate in the introduction of DVB-T only through frequency distribution but there is need for a much more intensive support. Experience so far has showed that state television channels operated primarily at public expense have a key role in the success of these services, and in order to facilitate a rapid spreading even the development of a state-financed equipment-subsidisation mechanism may become necessary.

Thus there are quite many open questions about the evolution of digital television for the time being. It is for sure that this industry operates in an extremely complex environment; technologies, regulation, the market and the social environment all have a significant effect on the development of DTV. It seems to be certain that the television sector is heading towards full digitalisation, yet expectations envisioning a complete discontinuation of analogue broadcasting within a couple of years in several European countries are undoubtedly irrational. Obviously, there are no market incentives which could enable the switchover to digital broadcasting, yet due to the lack of these state support will also remain rather limited.

3.4 The new media paradigm

With the development of technologies and the strengthening of media industry's entertaining function, services offered by the new electronic media appeared and begun to spread. The new electronic media, thanks to digital technology, is capable of transmitting a much larger amount of content to households at a lower cost. The diversity of content, increased flexibility and two-way communication allow of a previously unknown degree of personalisation, complemented by so-called high value added services. This does not only affect the business model of the supply side significantly, but also induces changes in consumer habits, consumer attitudes.

Personalisation has become characteristic for other industries, too (think of, for example, mass customisation in car manufacturing), yet it only gained a foothold in the field of media services in the last few years. Its main point is that consumers can follow their preferences to the maximum degree, they can not only view programmes broadcast on television channels but by practically accessing the database of providers – or at least the portion which was intended to be accessed by the public – they have a much wider choice of content. Considering the Internet this is a well-known phenomenon, yet these services are more and more available in the television sector, as well. A related topic is that in some cases, the audience may have an influence on broadcasted content (e.g. by voting), or that different communities may be formed (online chat, fan club, etc.) which, on their own, constitute a new type of entertainment for consumers.

New media services are available through various platforms (Van Dijk – De Vos, 2001):

- two-way (digital) cable systems
- digital satellite broadcasting
- digital terrestrial broadcasting
- fixed or mobile telecommunication networks (e.g. ADSL, UMTS)

It remains to be seen which platform will be the winner in the competition of technologies in the long run, and it would be too early to give a forecast, and what is more, it could hardly be done without investigating some technical issues. It is not yet known, either, which standards and which *conditional access* (*CA*) systems will rule the market. The success of each technology may significantly be affected by

government policies under construction in the majority of countries. For the time being, competition between various platforms of new media seems to be sure to exist for quite a while. Due to geographical and regulatory reasons, the technologies having a competitive advantage will not be the same in all countries, yet for the present we do not have to be concerned about any transmission platform to hold a monopoly.

Technologically, the two basic types of new media services, digital television and network media are completely different and these two sectors operate in a different regulatory environment, too. Nevertheless the chances of DTV and the Internet becoming each other's substitutes concerning the services offered to consumers are constantly increasing. A broadband Internet access enables the viewing of video content, yet a wide range of interactive services is also accessible through digital television. With a suitable technology and appropriate hardware consumers may even surf the Internet or send and receive emails. As a result of dynamic growth, Internet penetration is now above that of digital television in the majority of developed countries, yet one has to mention that DTV was introduced to the market somewhat later than network media. In the United Kingdom, however, the number of households having access to digital television and those accessing the Internet is almost the same; Internet achieved a penetration of 56 percent by June 2004, while DTV's penetration in September 2004 was 55,9 percent (Ofcom 2004a, Ofcom 2004b).

Thus the introduction and spreading of new media services takes place on several platforms parallelly. It is hard to predict what kind of services will be launched in the following years, yet one may be pretty sure that their evolution has not ended yet. The competition between technologies may also be expected to go on, however it is not impossible that the breakthrough of some revolutionary technology will override all of our present scenarios.

4. The introduction of interactive services to the media market

4.1 The definition of interactive television (iTV)

The appearance of digital television and the spreading of the Internet enabled the provision of personalized content, and at the same time, the interactive use of media. In recent years, research into interactivity became a popular topic in media economics, as many expect this service to bring about radical reforms in the television industry, and the media industry in a broader sense. For the time being, however, there is a lack of suitable business models, it is uncertain when iTV services will become mass consumption products, and even the definition of interactive television is somewhat unclear.

Interactivity is usually defined applying a multi-disciplinary approach. Based on the analysis of various definitions, Kiousis (2002) distinguished between communication-based and non-communication based definitions, the latter ones originating from the fields of psychology, sociology, information technology and computer design.

Kim and Sawhney (2002) presented two approaches of the concept of interactivity. One of them focuses on communication, emphasising that every single message is in connection with the preceding message. This model considers information sharing and exchange as the key elements of interactivity and interactive communication. The other approach considers the media environment to be determinative, thus interactivity exists if it is possible for users to modify media content in real time. Here, one can not ignore technological determination: technological structure of the medium determines the nature and scope of interactivity it offers.

The various schools concentrate on different characteristics of interactivity. As a summary of these approaches we may state that the basic characteristics of interactive services are (Carey 1994, Downes–McMillan 2000, Kiousis 2002):

- speed
- feedback
- real time
- flexibility
- level of control

Concerning *speed* we have to distinguish between objective and subjective speed. Data transmission is becoming faster and faster with technological development – what was considered to be fast a few years ago perceived to be slow by now. On the other hand, one may expect that today's fast technologies will not be considered fast in a few years' time, as the perception of speed on the user side is changing continuously.

Feedback is a critical point in interactive television. There is no consensus between researchers on the level of feedback necessary for interactivity to exist. It may be considered some sort of interactivity when with the usage of remote control the consumers have a choice of several hundreds of channels. Media economics literature does not recognise that as interactive television, even because of the lack of direct and substantive feedback to the platform and/or the programme provider. A wider choice on its own is not equal to interactivity, and it is rather far from the realisation of personalised content provision.

Real time is an important matter in interactive television, too. The service being closer to real time is perceived more interactive by the user. The *flexibility* of time is a related issue, as well, since in the case of e.g. an email, interactivity exists even if the answer is received several days later. Real time, consequently, must be treated in a flexible way, it can not be separated from the type of service in question.

Control has key importance as well, as it has a significant influence on service characteristics and on the way, how interactive services operate. The problems arising here are very similar to those related to feedback: it is questionable whether the possibility to switch to another channel or to shut down the device may be considered user control or not. It is sure, however, that the level of user control realised by new media services is much higher than that.

As we can see, there are a number of uncertainties concerning the definition, thus many try to by-pass this issue. One of the authors provides the following – not very telling – definition of interactive television: „the result of the process of convergence between television and the new interactive technologies" (Pagani, 2000, p. 25). Much more useful and much more widely accepted is the statement that interactive television is „two-way television in which the viewer can make programming choices and produce user input" (Van Dijk – De Vos, 2001, p. 446). Yet maybe this

definition pays too much attention to the possibility of choosing different channels – also present in traditional television – instead of focusing on the feature that consumers can influence available content by sending their inputs.

Partly due to these uncertainties in the definition, the term *enhanced television* is becoming more and more widespread, distinguishing itself sharply from interactive television. Enhanced television is characterised by one-way information flow, and the entire amount of information (e.g. textual information or pictures from various camera angles) forwarded by the provider gets through to the households. The users may view those pieces of information through their hardware device, typically a set-top-box. Since consumers do not „communicate" with the provider but only with their own device, this way of use is called local or *pseudo interactivity*. Practically, teletext services are built on this principle, yet some authors say that when consumers use the telephone as a feedback channel and vote by phone call or by SMS in the relevant programmes falls into the same category (Henten-Tadayoni 2002, Van Dusseldorp, 2002).

Pagani (2003), on the contrary, makes a distinction between local interactivity and one-way interactivity. By the former one he means the same, thus the communication with the device, the process when consumers recall pieces of visual or textual information from the set-top-box. *One-way interactivity*, however, exists when consumers can send signals through some medium yet there is no immediate answer. A typical example is whenever consumers vote on some issue, participate in some kind of quiz or ask, by simply pushing a button, for detailed information or catalogues of a product seen in an interactive advertisement. Pagani termed the third and highest level of interactive television *two-way interactivity*, which is the case when individual addressing and the flow of information in both directions is possible.

While additional information and services offered by enhanced television are always related to the programme, *interactive television* also provides various services beyond and independent of television programmes. ITV is characterised by two-way communication: consumers are directly connected to the provider's server, from which they can download the information they are interested in. This enables the provision of services previously available only through the Internet, such as electronic commerce and telebanking.

As a consequence of the above, I wish to distinguish between *interactive use* and *interactive television*. Interactive use does not necessitate two-way communication, the above-mentioned local interactivity is sufficient. This category includes the case when programmes are not influenced by the individual consumer but by the audience as a whole. It is the case when viewers can decide by phone (SMS) votes which movie – from amongst some previously announced ones – the provider should broadcast, or when the public votes for or against some player of a reality show.

Interactive television, on the contrary, is used in the sense of *such a two-way television service in which the consumers can influence the content individually by sending various inputs*. Concerning more advanced applications the term multimedia service would be more appropriate, instead of television service. The availability of texts, photographs and communication services besides the usual audio and video signals are also included in this term. What is more, by the expression multimedia service we could overcome the problem that one may want to consider technologies other than television platforms, for example network media. The phrase '*influence the content individually'* is important in order to make a distinction between interactive television and the traditional television programmes influenced by the public through some kind of vote.

The problem of defining interactive television will probably be solved by the market in the long run by showing which services can survive in the market and which can not. It may happen that in a few years' time one will have to consider completely different dimensions than today when talking about interactive television, which may also affect the definition of this service. Thus while the theoretical definition may very well be subject to perpetual debate, the market will sooner or later decide which services will become wide-spread and which services will become an element of interactive television.

4.2 The history of interactive television

The history of the development of interactive television was summarised by Carey (1994), demonstrating that the past of iTV dates back much further than most people would ever think. A very simple yet pretty smart form of interactivity appeared as early as the 1950's, as the children's series titled *Winky Dink and You* of the American television network CBS invited its viewers to a special game. Local stores

begun to sell a special plastic sheet, and children had to attach it to the screen of television sets. Children could use their markers to scribble onto this sheet thus „show" Winky Dinky, the cartoon character who was always in trouble, how to escape those sticky situations. One of the most significant drawbacks of this experiment was that a lot of children did not purchase the plastic sheet but drew directly onto the screen of the TV.

Shortly, various programmes featuring audience polls begun to spread, both in America and in Europe. An early form of this, also utilised in Hungary, was when during a song contest people could vote for the best singer with the help of some public utility, e.g. by turning the lights on. The winner was the one at which the utility provider measured the highest value in electricity consumption. A more refined variant of the same type is phone vote where viewers could express their opinion by calling certain phone numbers.

In the seventies, a number of interactive television experiments were conducted, academic organisations and public institutions both supported researches into this field. The experiences of those tests can be summarised in three main points. First, there were many technical problems: the methods applied were often rather immature and unreliable. Second, the necessary equipment was pretty expensive, the majority of households participating in their testing could never have afforded to own the hardware. It became apparent that there is no chance for market success unless the costs are seriously reduced. Third, some social problems besides technological ones did arise, too, as an innovation always necessitates a change in consumer habits. Those in charge of the experiments did not take this into account, thus several tests failed exactly because of participants' resistance.

The most interesting experiment during this era was the Qube system, which examined the commercial opportunities of interactive cable television in Ohio. The technology was much too expensive – the terminal to be deployed in the households alone cost some 200 dollars – and data transmission was very unreliable, too. It turned out that making interactive programmes is extremely expensive, nevertheless low-budget programmes cannot compete with the non-interactive programmes of traditional channels. In spite of the large number of households included in the test, participation in interactive programmes remained low, only a few game formats had become popular. It was a remarkable experience, however, that the number of

subscribers could be increased significantly by lowering the prices of pay-per-view (PPV) programmes: they were found to be a service with a high price elasticity of demand. Some formats, which later provided the basis of other channels, like the music channel MTV, came into being during this period, as well.

The main lesson from the Qube test was not the failure of interactive television in competition with traditional television programmes. Rather iTV must be developed in a viable economic and technological environment. Yet even under such favourable circumstances, it takes time for a new medium to achieve market success, as a change in the public's consumption habits is certainly the result of a long process. What concerns the importance of consumer habits, it is quite telling that three quarters of all Qube subscribers did not even try the interactive services offered by the system; even games shows with cash prizes which were the most popular amongst all programmes could only draw a mere two percent of subscribers (Mullen, 2002).

In the eighties, various forms of interactive media appeared in households, in business life and even in education. There were significant differences in the market acceptance of the different technologies; there were breakthrough successes (video recorder), total failures (interactive videodisc) and innovations whose history had witnessed several successes and failures (video games).

In the nineties, iTV tests (Orlando experiment, Hong Kong test) were already directly examining the opportunities for market introduction, looking for applications which may ensure business success (Berendt, 1996). It is an important point that this was the era when the different interactive devices became a part of everyday life. The use of computers had become usual, and by adding a CD-ROM drive they had been converted into multimedia terminals in a large number of households, thus computers provided the basis of most interactive applications. With time consumers got more and more confident about the operation of devices characterised by some type of interactivity. Thus automated teller machines (ATMs) and cell phones also found their way into people's everyday life just like PCs. This process continued to erode the barriers resulting from the resistance of the majority, thus it enabled the various platforms of digital television to introduce interactive services to the market by the second half of the nineties.

4.3 Interactive television services

Due to the development of the technology and the continuous hunt for marketable services a broad range of interactive television services is available today, and further broadening is expected in the future. The below table presents various types of interactive applications in ascending order of the level of interactivity.

Table 1: *Interactivity of applications in digital and interactive television*

MODE OF PARTICIPATION	*APPLICATION*
CHOICE OF CHANNELS AND PROGRAMMES	Conditional access systems Electronic programme guides Decoder VCR
CHOICE FROM MENUS AND TRANSACTIONS	Video-on-demand (VOD) Customization (choice of camera angle, replay, more item display, plots or storylines) Additional channels (e.g. for background information or advertisement) E-commerce (goods and services)
PRODUCING INFORMATION	Participation in the programmes (directed) Reactions/commentary to programmes Contribution to programmes/channels (not directed) Production of own programmes/channels
EXCHANGE/ COMMUNICATION	Communication about/in parallel to television programmes (viewer/user communities)

Source: Van Dijk – De Vos, 2001, p. 452

The first two levels of interactivity are closer to the digital television services in use today, while the third and fourth levels rather reflect an Internet-based approach. These „boundaries" will certainly fade with time, what is more, they have already faded in technologically suitable systems. Yet this kind of distinction still makes sense because of differences in consumer use and penetration.

Conditional access systems allow the provision of various pay services, while electronic programme list the programme of several hundred channels. They are key services of European digital television platforms. Into the same category fall personal

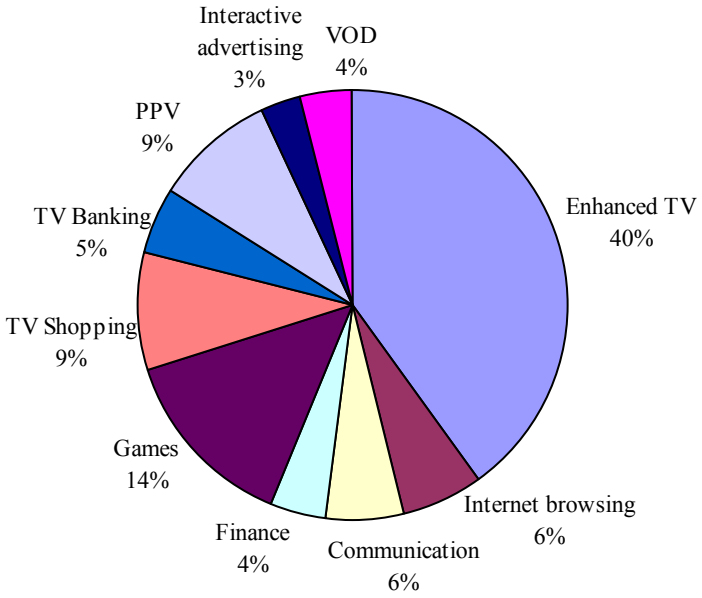
video recorders (*PVR*), its large storage capacity allows users to record programmes of interest and view them at same later appropriate time.

Video-on-demand (VOD) services provide consumers with a virtual video library with several thousands of movies, from which they can download the one they would like to view. Customisation is also a characteristic of digital television, which may be particularly attractive for users in the case of certain programme types (e.g. sports events). Additional channels satisfy further information needs of consumers, while e-commerce (the expression '*t-commerce*', already in use in international literature, would have been just as appropriate as this one) enables the purchase of various products and services.

The next two levels of interactivity mean something absolutely novel to consumers. From a technological point of view, television sets are capable to offer services like news through the menu (enabling users to tailor newscasts to their own preferences), the availability of supplementary information, voting, participation in games and quizzes, communication with other users and access to multimedia databases, yet today these are still associated more to the Internet. Tölgyesi (2000) mentions some other applications, too, like telework, e-learning, e-health, *karaoke on demand*, video conferencing or household networks for the linking of the various intelligent devices in the house.

For the time being it is a serious question whether these services will be rendered to users through television broadcasting, computer networks or some totally new method for the transmission of entertainment and information content (e.g. mobile technology). Another important question is which services from amongst the technically feasible ones will achieve market success, that will be able to raise and satisfy consumer demand. The next figure shows the distribution of incomes from interactive television in 2002, yet these data alone are hardly enough to draw a conclusion about the future of the industry.

Figure 3: *Incomes from interactive television in Europe, 2002*



Source: Pagani, M. (2003): Multimedia and Interactive Digital Tv: Managing the Opportunities Created by Digital Convergence. IRM Press. p115.

Also related to the uncertainty about market success is the quest for a so-called *killer application*, the application which is capable of changing consumer habits, thus of becoming a major driving force for the introduction of interactive services. Pay service was considered the *killer application* of the period when cable networks conquered America; the number of subscribers started to soar right after the launch of HBO, the first pay movie channel, in 1972. Concerning interactive television, VOD services and interactive games are considered by many to be high potentials for this kind of role. It is also possible that the discovery of the service achieving real market breakthrough is still ahead of us (Urbán, 1999).

4.4 Factors influencing the demand for and supply of interactive services

Similarly to other technological innovations, the key question about the market success of interactive services is, whether the critical mass necessary to ensure profitable operation and to turn market expansion into a self-reinforcing process can be achieved. Yet the value of this critical mass is rather hard to determine; Goff (2002) suggested that this value should amount to 15% of all households in the case

of broadband services. Other authors stressed that real market success is characterised by a „market pull" instead of a „technological push". It is not enough to launch a bunch of applications and simply wait for the reaction of the market, but it is necessary to raise the consumer demand for the new services (Van Dusseldorp, 2002).

In this early stage of the market development of interactive services, neither the demand nor the supply side is mature enough for a mass service to evolve. This is practically a 'chicken or egg' situation: demand is not large enough to make this market really attractive to the supply side, nevertheless because of insufficient supply people rather sit out and do not yet make use of new media services. The most important factors affecting the demand side are:

- Experience to date has shown that the spreading of interactive services (whether broadband Internet or digital television) is the fastest in the most developed countries, which is obviously related to the amount of consumers' disposable income and the size of the advertising market. It was empirically verified that the price elasticity of cable services is very high, with an average of 2.2 according to a US survey in 1989 (Owen-Wildman, 1992). Gálik (2003) underlines that in the public market the consumption of media products is income elastic. It is true for pay channels and also for pay-per-view, one of the many new media services.
- Besides price, the attractiveness of content does also have a significant influence on consumer decisions. The most expressive example is the success of the UK digital satellite broadcasting company BSkyB; experts ascribe the market leader position to the coverage of the Premier League, which is a real premium content in the UK. Convincing is the fact that from amongst the 6.6 million digital service subscribers the company had in Spring 2003, some 5 million also held a subscription for the sports channel providing the coverage (Cassey, 2003).
- A factor influencing demand may be consumers' willingness to alter their former passive consumer behaviour and to actively participate in the production of programmes (about consumer habits see chapter 5.1). Those who participate in votes and particularly in online communities or chat

rooms do have a certain desire for communication, which is certainly not a characteristic of the public as a whole. For the time being it remains a question how other consumers may be persuaded to become active. It is a fact, however, that consumer-produced content on its own contributes to the expansion of choice, so the community consumption is able to increase demand. It can be considered a kind of network effect, the more people consume some kind of service, the higher its consumer value.

- Ease of use may be critical to the spreading of interactive services, as well. One must take into account that many are still averse to new technologies, therefore user-friendliness and ease of use are essential to a successful market launch. It is not a coincidence that there are generational differences in the consumption of new media services, the youth is much more capable of using these devices than elderly people.
- Most probably, the relationship between the purchase of interactive services and the consumption of traditional media products will be one of the most popular topics in media research. People's spare time being limited in amount, the spreading of new media may well be supposed to reduce the amount of time spent on traditional media products, yet this has not yet been verified empirically. Nevertheless, opposite effects may also be expected, as some popular television programmes may increase the demand for related interactive services, as well (a top example is reality shows).
- The demand for interactive services is largely determined by the ratio of people for whom these services are available and the number of alternative infrastructures. Availability, consequently, is not to be neglected as a factor, which leads us to the analysis of the supply side.

Considering the supply side, we have to take into account that some infrastructures (e.g. cable networks) have been developing merely on business grounds, while others have enjoyed strong state support (e.g. digital terrestrial television). Yet apart from this, there are some remarkable factors influencing the supply side of new media services.

- The size of the market and its geographical features are decisive to the feasibility of different infrastructures. Densely populated areas are attractive

to wired networks (e.g. cable, DSL), which is not the case for sparsely populated areas. The advantages of terrestrial digital television are better capitalised on in flat areas, while the ratio of shadowed areas may be rather high in the mountains. Thus besides the size of the market (the number of accessible households), geographical characteristics also have an impact on infrastructure development.

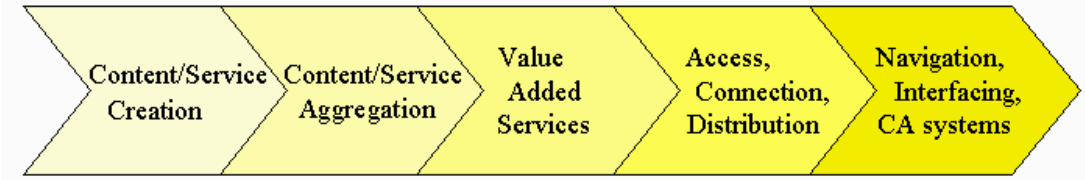
- The linguistic and cultural environment basically influences content development market. It is unnecessary to explain that the development of contents in world languages provides much better returns than in the case of smaller markets. The small size of the Hungarian market – aggravated by a weak infrastructure – represents too much of a risk for content developers, yet poor supply also reacts upon the demand side.
- The propensity to invest is also affected by the condition of a country's economy and the global „welfare" of the telecommunications/broadcasting sector. Some years earlier, at the time of the telecommunications boom, telecommunication companies had practically began an 'investment competition', and afterwards they were busy managing their debt. Nevertheless decisive is the general condition of the media industry, as content development also belongs to the supply side. Yet in the case of the media sector, recent years' rise and the setback afterwards may have been less apparent than in telecommunications.
- Governmental policy is important, too, as the government may decide to participate in infrastructure building in order to prevent the broadening of the digital divide and make the underdeveloped regions more competitive. Concerning terrestrial broadcasting, increased state participation is a must given that frequencies are in state ownership and that public services channels typically play an extraordinarily important role in content development. Even if the government does not want to directly participate in the development of new media services or infrastructure building, it certainly has an influence on the market by shaping the regulatory environment.
- The relationship between the demand and the supply of interactive services is a peculiar one, in so far as consumers themselves have a more or less

direct influence on supply. If votes reflect the preferences of the majority, they surely make the programme in question more attractive for many, and online communities do actually produce some content themselves. Thus the so-called *prosumer* phenomenon, later to be discussed in detail, is absolutely new and creates a much more dynamic relationship between supply and demand than in the case of traditional media products.

4.5 The value chain of interactive television

The value chain of interactive television is much more complex than that of traditional television. Previously, the activities of broadcasters and broadcasting (transmission) companies were the two most important elements in the value chain, they were the ones who produced and transmitted the content, respectively. Considering broadcaster, there has been a distinction between creating and packaging activities, yet the value chain as a whole still depicted a rather simple process. The value chain of interactive television, on the contrary, is a complex system, as a consequence of the altered industry structure and the appearance of new services and applications.

Figure 4: *The value chain of interactive television*



Based on Wirtz (1999)

The *creation* phase of the value chain represents content providers, film producers and web video producers whose primary function is the creation of video content. Success in the marketplace heavily depends on the quality of human resources, as their creative talent is of substantial importance in this case (Chan-Olmsted – Kang 2003). The reality show Big Brother may be mentioned as an example, demonstrating that a good programme idea coupled with appropriate implementation

may represent an enormous business value, which may be realised in a number of different ways.

Aggregation is a kind of packaging, and it has a dual function. First, it fulfils the role of broadcaster, thus collects various contents and compiles a complete programme. Second, it may refer to the development of channel packages that are offered to subscribers (e.g. in the case of a cable company). To acquire truly popular and valuable content which may attract the public or the targeted consumer groups is essential in both cases.

High value added services have a special role in the case of new media services. They may include both programme-related (e.g. electronic programme guide, video-on-demand) and programme-independent (e.g. e-commerce) interactive services. Technological know-how and strong marketing abilities are both necessary to pursue such activities.

Distribution is mainly offered by the owners of telecommunications and cable networks and access service providers. They provide the infrastructure through which consumers can be reached, thus achieving economies of scale and scope is essential for them (Chan-Olmsted – Kang 2003). Companies interested in distribution must reckon with rapid changes in the regulatory environment, as in recent years, the liberalisation of various infrastructures (telecommunications and cable networks) has become a major focus of regulatory policies in the most developed markets.

Navigation and interface services, and conditional access systems are typically provided by software suppliers and hardware manufacturers. Their core competences are technological know-how, the knowledge of consumers' needs and the access to distribution channels (Chan-Olmsted – Kang 2003). The significance of the latter one is well demonstrated by the fact that in the case of DVB-T, a uniform standard does not exist: neither for navigation services (EPG), nor for interface *(Applications Programming Interface, API)* or conditional access (CA) systems.

In the era of traditional television, content was considered to be the critical resource, as by purchasing and broadcasting attractive programmes, broadcasters could achieve high audience levels guaranteeing their market success. A good example is the case of ABC, one of the largest American television networks. Up until the

sixties, ABC only held the third position in the American television market behind its two major competitors CBS and NBC. However, ABC decided that purchasing the broadcasting rights for the Olympic Games was a great opportunity. With very few exceptions they provided coverage of all summer and winter games between 1964 and 1984. Shortly, an image of the 'television of the Games' had developed, which largely contributed to the development of ABC's core competences and the strengthening of its market position. As a result, ABC had become a worthy member of the triumvirate having ruled the American television market through several decades, up until the nineties (Klatell – Marcus, 1988). This case demonstrates the significance of the competitive advantage that the ownership of the broadcasting rights of such a prominent event could create – even though the Games only takes place every four years. The image of the channel and consumer loyalty, however, lasted much longer than just the few weeks period of the Games, and proved out to be a decisive factor in market competition.

Yet this is not the case today. Now, the bottleneck in the value chain of interactive television is undoubtedly represented by distribution, by access. The business model of any company may only be successful in the long run, if they can achieve a certain level of scale and scope. If they cannot, the revenues from subscriptions and advertisements are insufficient to cover the costs of infrastructure development and that of purchasing attractive contents, and to ensure appropriate returns on their investment. Today, as a consequence, those access service providers and network operators who can ensure to reach a sufficient number of consumers have a very strong position. Some experts forecast a change in favour of packagers: in the future, the ability to assemble contents, package them and sell it to segmented consumers can lead to market power (Chan-Olmsted – Kang 2003).

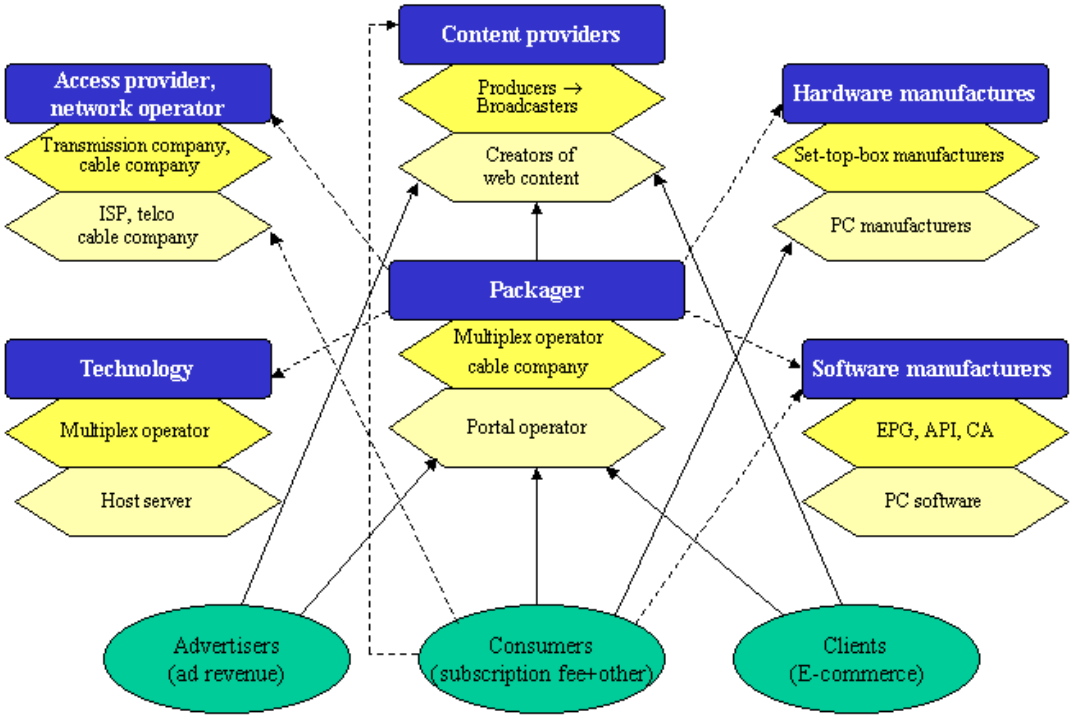
4.6 Technological neutrality in the market of interactive services

The value chain of interactive television itself shows that these services are 'produced' in a market with a large number of actors. The situation is further complicated by the fact that, as discussed earlier, similar services are provided through different infrastructures. Though computer networks and television platforms are by many considered to have different functions, we may still state that the spreading of the Internet and digital television in the market of interactive services also represents a competition between infrastructures. This is one of the

reasons why recent years' European regulatory efforts have increasingly focused on the requirement of technological neutrality.

In order to prove the substitutability between DTV and network technologies, the following figure shows a rather simplified representation of the relationships between market actors and the direction of monetary flows. It was sometimes difficult to find the equivalents of the digital television market actors in the Internet-based model; due to technological differences, they could not always be 'paired' properly. Nevertheless, the purpose of this figure is to show that the actors of the two models are analogous and that there is a high degree of similarity between the different business models of interactive services. Thus the very same diagram, irrespective of the infrastructure used, may represent the two models.

Figure 5: *The business model of interactive services*



The model identifies the most significant actors in the market of interactive media, differentiating between television- and Internet-based services. Continuous arrows represent those money flows, which constitute an elemental part of the model, they may happen in any one case. Money flows denoted with dashed lines, however, are

only characteristic for certain cases, e.g. dependent on the platform in question. It is worth taking a closer look at the actors of the model and their relationships.

The actors in the business model of interactive services:

- *Packagers*: This is one of the most complex functions in the respect that the actual function performed by packagers may vary dependent on the technology used. Moreover, considering digital television, different platforms mean different tasks for packagers. In the case of digital cable networks, this function is performed by the cable company, which makes all decisions about the development of various packages and about the pay-contents and interactive services offered. (Exactly the same function is performed by satellite providers, omitted from the figure due to the lack of space.) Regarding digital terrestrial television, however, the so-called multiplex operators are considered to be the packagers. A multiplex is a digitally transmitted package of programmes, offering 5 or 6 channels (or less, with the remaining capacity devoted to interactive services) in place of a single analogue frequency. In the countries where the licences for digital terrestrial television have already been distributed, tenders were usually sought for multiplex operator. The winner was allowed to decide on the channels to be included in the multiplex (certain restrictions may be applied, e.g. public television channels might be required to be included in the multiplex).

  Considering the Internet, portal is a well-known expression. In this paper, it is used in the sense that a portal offers access to a variety of content from the same content provider. The provider may be a vertically structured company (e.g. Origo – the owner is the Hungarian incumbent telco) or a broadcaster (e.g. Tv2 – Hungarian commercial television channel) or an independent company without any further stake in the media market (e.g. Index – one of the most popular portals in Hungary).

- *Content providers*: Content providers have a special role in interactive television, since they provide for the content which is then sold by the packagers to consumers. In the case of television-based interactive services, this category includes the broadcasters whose programmes are part of the DTV packages. Producers and external suppliers producing their own video content (show,

movie, etc.) and supplying broadcasters with various programmes are also considered content providers.

Considering Internet-based interactive services, the differences between these two levels is much more ambiguous. Here, content providers mean the market actors who supply portals with contents suitable for display on the web (e.g. video content).

- *Access provider, network operator*: It may be subject to serious debates whether access providers and network operators belong to the same category, as there are significant differences depending on the technology applied. For digital television-based interactive services, the packager (the multiplex operator or the cable company or the satellite company) performs the function of the access provider. Considering digital terrestrial television, however, the network is operated by the broadcasting company, which may or may not coincide with the multiplex operator (in the latter case, the multiplex operator and the broadcasting company only have a business relationship with each other). In the case of digital cable television, both functions, the access provision and network operation are usually performed by the cable company.

  Regarding the Internet, the picture is a bit more complex. The majority of interactive services are only available through broadband infrastructures (cable or ADSL systems). The above hold true for cable networks, too: the access provider and the network operator is usually the very same company. However, telecommunication networks are a different case. Access is offered by so-called Internet Service Providers (ISP), while the network itself is operated by telecommunication companies. Thus here, the two functions are definitely separated, even if the most telecommunication companies operate an ISP (like for example the market leader Hungarian telco Matáv, which established an own ISP under the name Axelero).

- *Technology*: Though separating technology may sound a bit unnatural, DTV makes this step necessary. Namely because multiplex operator may hire a separate company to perform technology-related management tasks (this has actually happened in Finland).

Considering Internet-based services, server operator companies constitute this category, if the portal operator decides to outsource these tasks.

- *Hardware manufacturers*: The role of hardware manufacturers should primarily be examined in the case of DTV. Television-based interactive services are an absolutely new technology, in a lack of established, uniform hardware and software standards. Consequently, manufacturers are closely linked to packagers, whether they are multiplex operators or cable companies. Once (namely in the case of ITV Digital, a former DVB-T platform in the United Kingdom), a multiplex operator supported consumers' set-top-box purchases in order to speed up the spreading of the technology. As a related matter, the role of the state should also be mentioned. European DVB-T platforms were established with a significant contribution from the state, and consumers often receive state subsidies on the necessary set-top-box devices. An example is Sweden, where a subsidiary of the state-owned broadcasting company ensures that consumers can rent a set-top-box for a low fee instead of having to buy it.

  This is not a relevant topic regarding Internet-based services, as personal computers are sold on business grounds merely, and large PC manufacturers are typically not closely related to any actor of the interactive services market.

- *Software manufacturers*: The statements in the previous section apply for software products, as well, thus we only discuss what regards DTV. This matter is of special importance to DVB-T, characterized by a lack uniform standards, as in each country, multiplex operators can make their choice themselves between the various conditional access (CA), interface (API) and electronic programme guide (EPG) systems necessary to provide pay services.

  Looking at Internet-based services, the relationship between interactive service providers and software manufacturers is a much looser one. However, the most powerful software companies may try to enter the market. An example is WebTV established by Microsoft, which, however, was not much of a success, therefore it is not relevant to our topic, either.

Important actors of the model also include consumers, advertisers and companies interested in e-commerce. They are primarily sources of income in the model, this is why we have to examine the three possible financing mechanisms of interactive

services, as well. At the same time, these mechanisms also identify the actors of the income side (Chan-Olmsted – Kang 2003):

1.) advertisers (advertising incomes);
2.) consumers (subscription fees + other incomes);
3.) business clients (commissions on e-commerce activities).

The first two sources of income do exist in the case of Internet-based services, too, yet they play a much more significant role in traditional television. Advertising incomes constitute the majority of commercial channels' revenues, while pay channels are rather characterized by subscription fees. The size of the market, that is economies of scale is a decisive factor for both. If the audience is too small, the revenues from both subscription fees and advertisements will lag behind expectations.

Interactivity may have a dual impact on advertising efficiency. On the one hand, target groups can be accessed more efficiently as service providers know more and more about the media consumption habits of their users. Interactivity, namely, does not only allow users to access the desired content, but they are continuously expressing their preferences, thereby allowing service providers to draw consumer profiles (the use of such profiles, however, may seriously be restricted by data protection legislation). On the other hand, the customisation of contents, the introduction of personalised television allows consumers to avoid watching advertisements. Consequently it can reduce advertising efficiency, as it was underlined years before by Grove (1996), the president of Intel.

Considering the revenues from consumers, the so-called other incomes are worth emphasising. Recent years have brought about the popularity of premium phone numbers and SMS numbers in various television formats as a means for consumers to vote on various issues – political questions, quizzes or reality shows. How revenues are shared is largely dependent on whether the programme is licensed or produced in-house, yet the parties treat any details as confidential. The Hungarian channel RTL Klub, for example, had to share the incomes from votes related to its own reality show ValóVilág with its telecommunications partner only, while its competitor Tv2 had to split the revenues earned from the licensed Big Brother

production into three – in order to pay for the license and for the various telecommunication services (Vrannai, 2002).

This is a rather new type of income, therefore no research has been done yet into the price sensitivity of consumers. Still we know that in the Netherlands, the 'home' of Big Brother, the tariffs of the premium phone (and SMS) numbers were doubled after the first series – yet there was no decrease in the number of voters. The music channel MTV, however, is a counterexample: they also doubled the tariffs of votes to European Music Awards, which actually decreased viewers' willingness to vote (Van Dusseldorp, 2002). Price sensitivity is definitely dependent on the popularity of the programme in question, on the nature of the vote (e.g. whether votes only express people's opinions or they do indeed influence the flow of the programme). However, further empirical studies are required to research this field.

Today, the third type of income is primarily associated with Internet companies, even though there are some broadcasters already drawing revenues of this kind. Commissions on electronic (television) commerce may add up to a considerable amount if the company's turnover is appropriate. At this time, however, a successful business model could hardly be built upon this source of income alone.

An important remark is that advertisers and the businesses paying commissions are usually contracted with the packager (portal operator) in the case of the Internet model, and with the content provider (more specifically with the broadcaster) in the television model. Nevertheless consumers' payments for pay contents go to the packager, irrespective of whether this role is fulfilled by the operator of the portal, the multiplex operator or the cable company. At the same time, they also have to pay for their access (e.g. to the ISP), the necessary hardware devices and sometimes for the software products, as well.

Theoretically, some other sources of financing – like for example revenues from sponsoring or merchandising – might exist (Digitopia, 2000). In spite of this, the three factors in the model, the advertising incomes, the subscription and usage fees, and commissions are expected to remain the most significant elements in the income structure of interactive services.

5. The spreading of services in the market

5.1 The saturation of media markets, changes in consumer habits

The issue of saturation is a much more serious one in the case of the consumption of media services, information and entertainment content than for physical products. The time spent on media consumption is more or less constant within each life stage of a given consumer, dependent on age, profession, marital status and social status. The appearance of new services, the widening of choice is not accompanied by an increase in consumers' spare time, which is a definite limit to market expansion.

A special feature of media industry is that the efficiency of its products is not measured in the traditional way. In the case of many other sectors, efficiency means that consumption of the products can increase the consumers' spare time (just like automobiles, modern household appliances or the new banking services). Regarding media, this kind of efficiency does not exist. A movie cannot be watched faster than its real time (or at least it is not worth doing so), and similarly, the reading of newspapers and magazines cannot be speeded up artificially. A frequently quoted thesis originally formulated by Baumol and Bowen is that the cost inflation in cultural industries is caused by the fact that performances and services cannot be produced in a more productive and efficient way, due to the work-intensive nature of production (Daubner et al, 2000). According to Gálik (2003), this is also valid for some products of the media industry, like sports broadcasts.

Nevertheless, little attention has been paid to the fact that the improvement of efficiency and productivity is impossible not only on the supply side but also on the consumer side, and this constitutes an objective limit to media market expansion. With demand-side efficiency interpreted as an increase in consumers' spare time, it is worth looking at the characteristics of media consumption. Apart from some new tendencies (e.g. the universal habit of background radio listening, more specifically radio listening in cars, newspaper reading on public transport vehicles or Internet surfing during business hours), the consumption of media services does not improve efficiency as related to the spare time of consumers. A related matter is that a new television channel or a new magazine can increase consumer demand for media in general only to a limited extent, the substitution effect is much more characteristic.

These limits to the efficiency of media consumption may partially be eliminated by interactive services, as they do not only represent an increase in the quantity of supply but a qualitative improvement, too. Extended consumer control and the opportunity to access personalised services ensures that consumers can avoid less relevant contents and that they can specifically target the services they are interested in. You will not be able to watch a movie faster, of course, yet in the case of some programme types (e.g. news, shows) consumers will have the opportunity to watch specific contents.

Considering interactive television, the improvement of efficiency may be more widely interpreted than a reduction in viewing time merely. Traditional television was basically built upon entertainment and information content, while Wirtz (1999) found some new functions satisfying consumer needs in the case of iTV. According to him, interactive television also satisfies consumers' transactional, personal communicational and educational needs beyond the traditional two (entertainment and information). Thanks to iTV, consequently, consumers can access a larger amount of the desired content within the same time, and it partially compensates for the lack of efficiency improvement. This also means that the saturation of traditional media markets does not prevent a significant expansion in the market of interactive television and that of interactive services in general.

Still, a serious question about interactive television remains whether it will be able to satisfy existing consumer needs and possibly to create some new needs. A number of researchers think that the consumption habits formed in the past few decades may significantly hinder the spreading of interactive television.

A popular view is that the traditional way of television consumption is sitting in front of the screen munching on chips or with a sixpack of beer. This passive kind of viewer behaviour was expressed by the collocation *couch potato*. This type of attitude does undoubtedly exist: the majority of viewers simply wants to relax after a day of hard work, thus the compilation of personalised content, that is the editing of their own programme is not a very desirable alternative. In such cases, consumers spend their spare time consuming (the content compiled by professional editors) instead of editing (their own personalised programme).

Other media researchers, for example Negroponte (1995) who became famous for his futuristic ideas, say that the new technology also shapes interactive use, the new type of media consumption. The newly developed type of user is simply called interactive user by literature, yet the expression *desk potato* by Wolf (1999) seems much neater. This term basically covers the Internet-like, active type of use, including the individual editing of programmes. It is unclear, however, whether the majority of consumers is willing to change their television viewing habits to such a great extent. It is noteworthy that this concept does not only apply to television, after all online newspapers also allow of a selective use, the individual 'tailoring' of various editors' contents. This kind of total customisation was termed *„Daily Me"* by literature (Gálik 2002, Sparks 2002).

The differences between the two extremes of media use, couch potato and desk potato may be resolved by *lazy interactivity*, a concept for a limited kind of interactivity. Lazy interactivity implies that viewers are willing to put some effort into accessing the desired content, yet the level of these efforts is definitely limited. It follows from the concept that applications must be user-friendly, easy-to-use, they have to support quick decision making and they must continuously satisfy consumers' needs. The first application entirely fulfilling the requirements of *lazy interactivity* was the electronic programme guide, EPG (Bernoff et al., 1998). Experience shows that VOD, the individual ordering and viewing of movies, is an attractive service, too. It practically means the editing of one's own television programme, yet consumers' efforts needed to watch the desired movie are kept at a very low level. According to this consideration, VOD also belongs to the lazy interactivity type of use.

It should be realised that the services related to lazy interactivity are basically associated with television, as both EPG and VOD are primarily related to this platform. One could possibly state that digital television, considering its use, is some kind of a transition between the multichannel model of traditional analogue television and broadband networks offering full interactivity. Digital television is not yet characterized by full personalisation, yet some interactive services facilitating a more powerful expression of consumer preferences are already becoming widespread.

An interesting aspect of interactive use is the ambiguity in its terminology. A research project revealed that some of the market actors tend to emphasise activity thus use the expression '*user'*, while others referred to the consumers of interactive services as '*viewers'*, implying a passive type of consumer behaviour (Van Dijk – De Vos, 2001). Thus for the time being, there is no consensus on which one of the two expressions implying two entirely different types of consumer attitude should be used. Nevertheless, in order to reflect the changes in consumer habits and in the industry environment, this paper prefers the expression 'user'.

Considering the characteristics of the activity, interactive television may be regarded as a new type of consumer behaviour originating from the mixture of traditional television and the Internet. This, however, does not only imply theoretical questions, but practical ones, as well, which may seriously influence the success of new products and services in the long run. An important difference is, for example, that TV programmes are usually watched by the entire family in the living room, while people rather use the Internet alone, in their workroom. Consequently, the television set is at a certain distance from people, while the computer screen is directly in front of us when using the Internet (Van Dijk – De Vos, 2001). A study in the United Kingdom, which has a rather developed iTV market, revealed that quite a lot of consumers are worried about using personal applications, like telebanking or e-mail, in the living room (Goodwin, 2004).

It is hard to tell which model will be more characteristic for interactive television, yet it is rather probable that the new consumption habits will actually influence the success of the various services. Individual services, like e-mail will possibly be less popular in a television-like context. In the case of Internet-based use, the popularity of visually more attractive 'family events' (like movies, concerts) may lag behind expectations.

When discussing the various possible types of consumer behaviour, one has to differentiate between the so-called linear and non-linear programmes. Non-linear programmes ensure a higher degree of interactivity, as news programmes or TV shows are made up of well-separable elements, suitable for compiling one's own programme. This is the case when consumers may be referred to as *prosumers* (*producer* + *consumer*), thus they are content producers and consumers simultaneously (Gálik, 2002). Linear programmes, however, like movies or TV

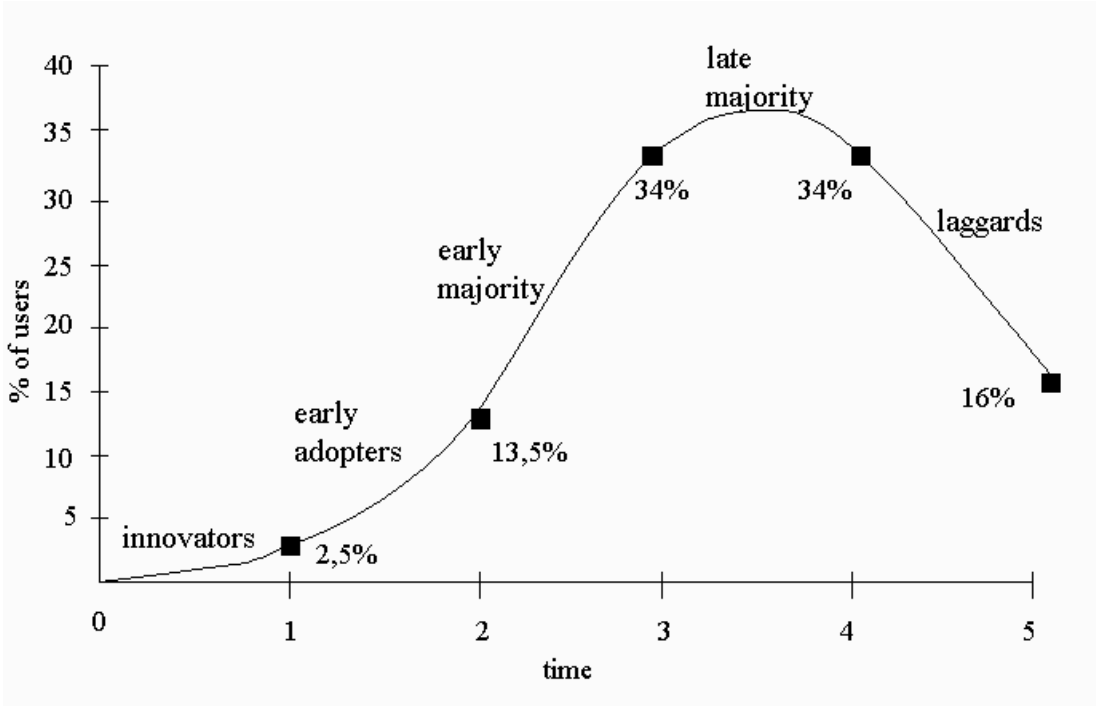
series, do not really allow of individual editing. What is more, consumers may not be willing to become scriptwriters at all. In such cases, interactivity is limited to the decision about when to view the programme, and to accessing background information about the actors and the programmes.

Sport events do not really qualify for any of these two categories. The outcome of the event cannot depend on consumers' preferences, of course, yet the experience of viewing the broadcast may still be heavily influenced by the viewer's choice. There are certain broadcasters who enable their users to decide which one of several simultaneous events (from the same championship) they would like to watch. The viewers of the digital television of BBC, the public television of the UK, have already had the choice from amongst five simultaneously running matches of Wimbledon Tennis Championship for years, thereby doing some kind of a director's job. In other cases, consumers may choose various camera angles, replay the most spectacular scenes or view customised statistics, thus the degree of consumer participation is relatively high.

5.2 The general theory on the diffusion of innovations

The trend of the diffusion of new products and services can be determined rather easily. Rogers (2003) established an S-curve for this purpose. According to the theory developed in the sixties, having been proved several times since then, the formation of the consumer group using the new service is quite slow for most innovations. As the group reaches the critical mass (mathematically: the point of inflexion of the diffusion curve), market expansion accelerates, more and more people join the group of consumers. Several categories of consumers can be distinguished based on their acceptance of innovations, as demonstrated by the following figure.

Figure 6: *The diffusion of innovations*



Source: Rogers, 2003. p. 281, and Weber-Evans, 2002. p. 440.

Looking at the acceptance of new products and services, five more or less well-differentiable groups of consumers can be distinguished. The categories are characterized by different socio-economical status, different personalities and different communication behaviour (Rogers, 2003):

- Innovators (2,5%): Innovators are the first to try new products, they are primarily characterized by a high degree of venturesomeness. Typically, they have some idea about the technology, they are quite well-off, and they prefer a cosmopolitan way of thinking. Another common point is that usually, some kind of a relationship does exist between the individuals of the innovator group in spite of large geographic distances.
- Early adopters (13,5%): Early adopters are a more integral part of the local social system than cosmopolitan innovators. The ratio of so-called opinion leaders is particularly high in this group, potential consumers tend to rely on the experiences of early adopters. They are not really isolated from their environment, thus their joining the group of consumers is decisive for the

majority. It is particularly important that early adopters largely contribute to reaching the critical mass.

- Early majority (34%): The early majority may be characterized by some kind of deliberateness; it takes time until they become consumers. This group's importance to the spreading of the innovation stems among others from the large number of its members, who are not opinion leaders yet they have an extensive network of social relationships.
- Late majority (34%): They might also be called the skepticals. These people are only willing to join the group of consumers if the vast majority of the society has already tried the innovation in question. Often, they only become consumers as a result of economic pressure or pressure from their personal relationship network. Certainty is particularly important for the late majority: any uncertainty about the innovation must be eliminated in order to make them consume.
- Laggards (16%): This group consists of traditionalists, strictly adhering to established consumption and usage patterns. They are heavily suspicious of any innovation, their frame of reference is the past and the events of the past. These people are often socially isolated, nevertheless there is some kind of rationality in their behaviour: they tend to be in a heavy lack of resources, thus they have to go for sure when making a consumption decision.

Yet the success of innovations and the rate of diffusion do not only depend on consumer attitude but also on the characteristics of the product or service in question. Rogers (2003) identified five factors having a central role in the diffusion of innovations:

- *Relative advantage*: it stands for how much the advantages of a given innovation are felt by consumers as compared to existing products and services. Besides economic considerations, perceived utility may also be influenced by social prestige, comfort or satisfaction.
- *Compatibility*: the innovation must be compatible with existing values, past experiences and consumer needs. The more compatible the innovation, the smaller consumers' uncertainty, which facilitates the acceptance of the new product or service.

- *Complexity*: expresses what consumers think about the extent of efforts needed to understand and use the innovation. The rate of acceptance is largely influenced by the complexity of the innovation.
- *Trialability*: the opportunity to try the innovation, to acquire personal experiences with it reduces consumers' uncertainty. The rate of diffusion improves if consumers can familiarise themselves with the innovation in a step-by-step manner, starting from the simplest application and proceeding gradually towards understanding the most complex ones.
- *Observability*: stands for how much the results of the innovation are apparent to consumers. The more observable the achievements of the innovation, the more likely consumers are to try it themselves.

How fast innovations are adopted does not exclusively depend on the product's features. There are other influencing factors, as well, like the decision making method, the characteristics of communication channels, the norms of the social system and promotion efficiency. However, these do not constitute the subject of this dissertation, thus the investigation will continue to focus on product features and consumer behaviour.

5.3 The diffusion of innovations in the market of new media services

Considering the characteristics of interactive services, its relative advantage is rather significant. Interactivity, whether television-based or Internet-based, offers higher-level services than traditional television. Compatibility and complexity are a different matter, as one of the factors hindering development may be exactly that many consumers find its usage much too complicated and the nature of the experience does also differ from what traditional television meant. That is why user-friendliness and simplicity are considered fundamental requirements in the interactive services market. There are no worries about trialability, since consumers can gradually familiarise themselves with the new services without any significant negative consequence. Above a certain level of market penetration, observability may not be a problem, either.

According to Scott Gronmark, the director of BBC's interactive division, interactive television is in the stage of early adopters right now, therefore particular attention must be paid to the process nature of the acceptance of new technologies. For the

investments to turn profitable, one has to wait until the public gets to know the innovation and accepts it (Van Dusseldorp, 2002, p.16.).

The adoption of interactive services is in a too early stage to prove or disprove the diffusion theory. A theoretical description has not yet been developed due to the technological developments taking place on several different platforms parallelly, to the immaturity of business models and the financial instability of the infocommunication sector in recent years. In spite of the above, the research of the diffusion of new communication technologies and related consumption habits has received particular attention.

According to Rogers (1986), three characteristics should be considered when dealing with new communication technologies. One of them is the *critical mass*, as the value of any communication service is actually created by the fact that others use it, as well. A frequently quoted example is the phone: the utility of this device was practically zero to the first owner up until the time when they could reach others on the phone. In the background of this approach is the network effect known from microeconomics, which states that the utility of any product or service increases exponentially proportional to the number of its users. This is only partially true for interactive media services, the number of users does not directly influence the utility perceived by others. What we have here is a kind of indirect effect: with the number of users growing, more and more actors invest in content and infrastructure development, thus more and more services become available.

Second, we have to emphasise that the industry in question is characterized by *tool technologies*. The techniques can be applied in a variety of ways to diverse situations. The popular applications are shaped by consumer habits, by re-discovering the devices themselves. Regarding the Internet, researchers were only talking about the substitutability of television and newspapers in the beginning, the popularity of e-mail, chat and forums only became apparent somewhat later. The popularity of SMS in mobile telephony was a surprise, as well. What is more, researchers had never thought that the diffusion of mobile technology would affect the television industry through the appearance of various votes. Accordingly, even though the development of infocommunication technologies is the result of well-planned business and engineering activities, the decision whether a specific service becomes popular or not rests with the people.

The third factor to be considered is that in the case of infocommunication technologies, the acceptance of innovations and the mere fact that they are consumed is less significant than the intensity of *use*. According to Rogers, the dependent variable of related studies should not reflect the decision about whether to use a product or not but rather the extent of its use. Livingstone (2002) follows the same approach when stating that policy programmes should not primarily focus on providing access to these services but rather on motivating people to use them – which is a bit more problematic, indeed.

Considering new media services, one should underline interactivity, the revaluation of individuals' roles and asynchronity (Williams et al., 1988). The asynchronity is new to electronic media. In the case of traditional television, production (broadcasting) and consumption usually go on simultaneously. Regarding the new media, the production of services is indeed separated from their consumption due to the appearance of interactivity and the increasing extent of consumer control. What regards interactive services, development was observed to be slow in the early stages of diffusion as compared to non-interactive services, yet the trend changes in later stages. This phenomenon is associated with the already mentioned critical mass approach: after having passed a certain phase, diffusion speeds up irrespective of any other factor.

A comprehensive research of the adoption of interactive services as based on the diffusion model of Rogers has not yet been completed, yet some technologies have already been researched. Based on the diffusion model, Kang (2002) investigated the adoption of digital cable services (considered to be one of the major platforms in interactive television). He concluded that the theory is suitable for describing the diffusion of digital cable services.

Lin (1998) studied the diffusion of home personal computers. Results showed that adopters, likely adopters and non-adopters constitute well-distinguishable groups by demographic structure, media consumption characteristics and by the ownership of communication technologies. In line with other researches, it was concluded that there is a relationship between television viewing and home PC use, yet there was no significant relationship for other media (newspaper, radio).

A study on the spreading of fax and audio-information services confirmed the importance of variables related to personal communication. Life quality explained acceptance to a moderate degree, variables related to media usage did not yield a significant result. Social indicators could only be used to predict acceptance in the case of the fax and not for audio information services (Neuendorf et al., 1998).

The research of Atkin et al. (1998) into the diffusion of the Internet confirmed the existence of demographic differences between adopters and non-adopters. Results showed, that technological orientation has a decisive role of on acceptance. Having examined media consumption habits, they also proved that people having access to the Internet spend less time watching TV than those without an Internet connection.

In spite of the differences in consumers' attitudes and the existence of well-differentiable segments, finding appropriate applications might accelerate the diffusion of technical innovations. For example, few people believed that reality shows, popular in quite a number of countries worldwide, would become the pioneers of interactive services. Phone and SMS votes are not the only indication of such a role, since technologically speaking, this is not interactive television at all. The diffusion of broadband Internet usage that enables consumers to know about everything that happens to the participants is very important, too. Several authors, among others Máth (2002), called our attention to the fact that reality shows, as a genre, are capable of reforming consumers' Internet usage habits.

The development of successful innovations may be fostered by taking into account recent years' basic tendencies in consumer needs. Interestingly, while miniaturisation is one of these trends (just take, for example, cell phones and their integrated cameras), 'gigantic' devices are also becoming more and more widespread at the same time. An example for the latter phenomenon could be the spreading of home theatre systems. Of course, the improvement in quality may be much more attractive to consumers than the size of these devices.

6. The relevance of studying interactive services in Hungary

6.1 Digital television in Hungary

What regards digital television, we may definitely state that there is a lot of uncertainty about the diffusion of the technology all over the world. The actors on the supply side are still looking for potentially successful business models, while on the demand side, not much is known about the market acceptance of new services. This is particularly true for Hungary, the market of which is characterized by a much less favourable business, regulatory and social environment than the countries of Western Europe (and particularly North America).

Hungarian digital television is in a very early stage of development. From amongst the three platforms, only satellite DTV is available: UPC Direct had some 120,000 subscribers at the end of 2004. This company, however, offers a much smaller choice of services than Europe's large satellite broadcasters. Basically what may be attractive to consumers is the large number of television channels. Today, UPC Direct offers about 150 channels, including four premium channels, yet the majority of interactive services already known to more developed markets is unavailable. The only exception is EPG, the electronic programme guide, which may substitute traditional TV magazines by displaying the full choice of programmes on the screen.

Digital cable television is not yet on offer in Hungary, yet it is publicly known that major providers are already assessing the possibilities of launching this service. There is no doubt that our cable networks are going to be digitalised in the long run, however we do not know when and the range of services to be introduced is not yet clear, either.

There are even more uncertainties about the introduction of digital terrestrial television. As discussed in section 3.3.2, this platform necessitates state participation, and what is more, the immaturity of the business model has already lead to a number of European companies going bankrupt. The experts of the state broadcasting (transmission) company, Antenna Hungária Ltd., began with the development of the potential scenarios of the introduction of DVB-T. Digital terrestrial broadcasting was already started Fall 2004 in the region of Budapest and Lake Balaton. For the time being, however, only the Hungarian public channels are included, which is not regarded as a particularly attractive choice. Moreover, the set-top-box devices

necessary to view these public channels are not really available in the marketplace, either. Therefore this is a kind of technical test run rather than a service with market relevance. Today, there is no clear governmental determination to introduce DVB-T on a country-wide level, even though this is usually part of the information society programmes of other EU countries. The situation is further complicated by the fact that the Media Act (Act I of 1996 on Radio and Television Broadcasting) may only be amended with a two-thirds majority. Currently there is a total lack of consensus between Hungarian political parties on any proposal aiming at the radical transformation of the country's media structure. Practically speaking, the Media Act and the political atmosphere as related to this matter definitely hinder the market introduction of digital terrestrial television.

The small size of the Hungarian market does not only worry those interested in infrastructural investments. Our competitive disadvantage in content development, partially caused by the Hungarian language itself, is particularly important, too. This is incomparable to e.g. the choice offered by the Anglo-Saxon market. The situation is further worsened by the fact that a significant portion of the population does not speak any foreign language at an appropriate level (in contrast to the linguistically similarly problematic Northern European countries making up for this drawback with a proficiency in foreign languages). Content development in Hungarian is not at all attractive to multinational companies. The majority of Hungarian media enterprises is in a continuous lack of capital and the public television corporation is in a particularly deep and long-lasting (as compared to the rest of Europe) crisis. The latter problem might have a direct impact on the introduction of digital terrestrial television as public television channels usually play an extraordinarily important role on this platform (the public television broadcasts nine channels in the United Kingdom, six in Sweden and five in Finland, being the major content suppliers of DVB-T in these countries).

The motivational role of the state is less significant in Hungary than in the majority of European countries. Hungarian government could not keep abreast with recent years' fast development in the infocommunication sector. They have only just started the development of the comprehensive strategic concepts needed for the efficient allocation of available monetary resources. The lack of a governmental decision on the introduction of DVB-T and the aforementioned issues with the Media Act

indicate that sooner or later we will have to find not only a regulatory but also a political answer to these questions.

The majority of market actors do not consider the Hungarian market to be of strategic importance, either. Infrastructure and content providers are typically owned by foreign companies, and the setback experienced by the infocom sector at the beginning of the decade slowed down Hungarian investments, as well. The reasons are: small market size, low purchasing power and a weak advertising market. This is why there is no competition on digital television platforms, and no clear plans about the introduction of DVB-T.

Uncertainties about the market acceptance of new media services are large on the consumer side, too. Besides language problems, one has to reckon with the very low level of digital literacy: a significant part of consumers is averse to modern technical devices. The lack of powerful, attractive contents, which might urge people to invest into something beyond today's television programmes, is likely to be a serious problem, as well. In several European countries (United Kingdom, Spain, Italy, Germany), purchasing the broadcasting rights of the national football championship meant a significant increase in the number of subscribers, a step towards reaching the critical mass. Yet it hardly needs a rigorous proof that this would not be a successful strategy in Hungary. (This dissertation is not about the current situation of the Hungarian football, but any way, the national team could not qualify for any of the World Cups or European Championships in the last two decades. The level of the national league is incredible low, and none of the clubs have reached a remarkable result in the international cups since the eighties. Soccer fans follow the Premier League, the Serie A, the Bundesliga or the Spanish league on satellite channels, but the Hungarian matches cannot attract a mass audience.)

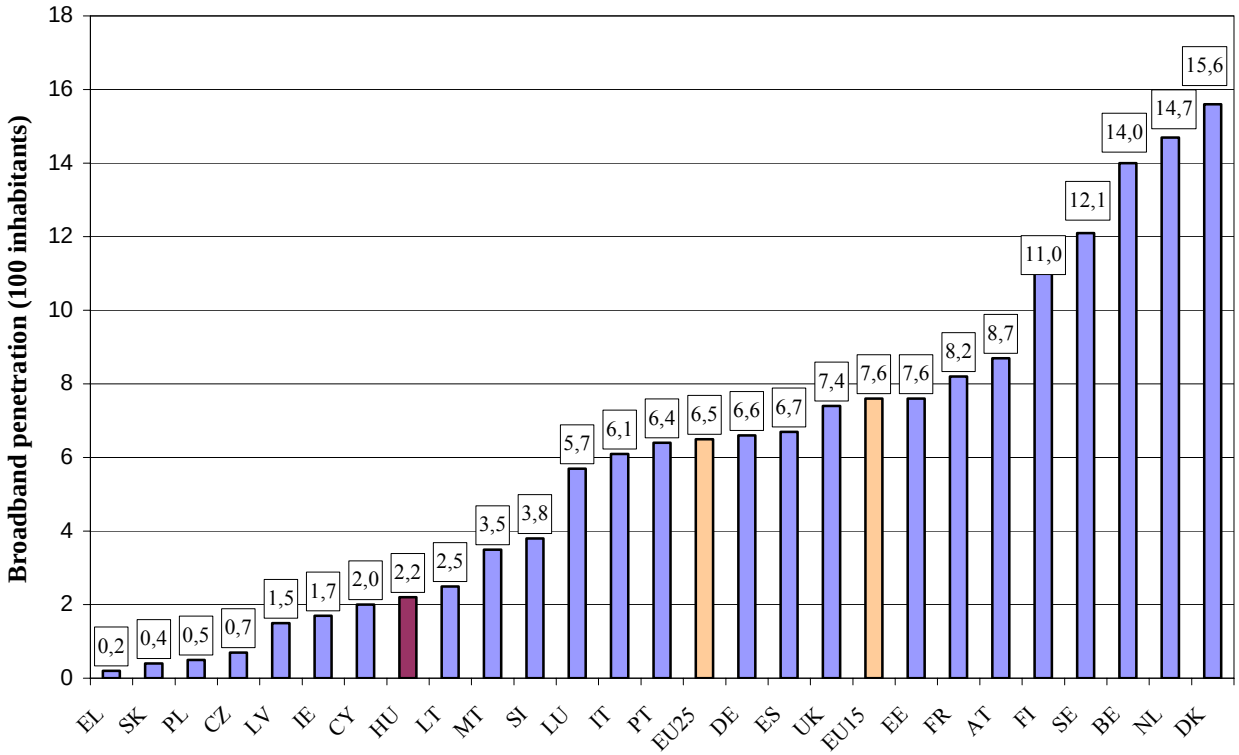
According to the above, digital television is not expected to become a leading technology in Hungary. For the aforementioned reasons, market actors are certainly not going to start significant investment projects in this sector. The state-supported introduction of DVB-T is theoretically possible, however, this is absolutely unlikely to happen earlier than 2007 (this is when the broadcasting licences of commercial television channels expire; launching DVB-T earlier might cause serious legal consequences). Considering the lengthiness of the launch process (establishment of the regulatory environment, resolution of technical issues, development of the

business model, tendering process), negative international experiences and the fact that there was no apparent governmental determination at the end of 2004 to start the project, I am rather confident that DVB-T will not be introduced to the market before the end of the decade.

6.2 Broadband Internet market in Hungary

The diffusion of broadband Internet could be described as a huge boom all over Europe. The number of broadband subscribers in the extended European Union in July 2004 was 29.6 million, versus 17.2 million in July 2003 and 8.8 million in July 2002, the latter two figures referring to the EU-15 (CEC, 2004). Broadband Internet means a lucrative market for telecommunication companies, a new service platform for consumers, and a further opportunity to build the information society for the government. This latter statement is supported by the fact that more and more countries develop an own broadband Internet development strategy as related to the eEurope 2005 programme. The significance of governmental contribution could hardly be questioned; reaching the critical mass as early as possible is key to national competitiveness. Until that point, infrastructure and content development both represent high risks with low returns. That is why there is a need for state participation in the early stages of diffusion. The differences in development between the broadband markets of various European markets are rather large for the time being (*Figure 7*) yet the development of the sector in the Union will certainly go on.

Figure 7: *EU25 Fixed broadband penetration rate, 1 July 2004*



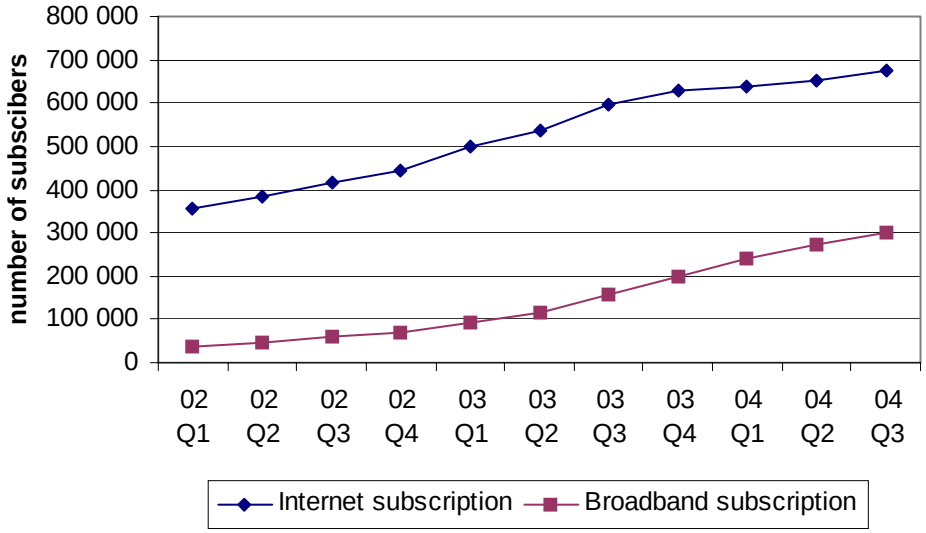
Source: European Electronic Communications Regulation and Markets 2004. COM(2004) 759

Concerning the situation in Hungary, the document on which the development of the sector is to be built was prepared in 2004 under the title Broadband Electronic Communications in Hungary. This may be regarded as a kind of comprehensive status report, which may be the basis for the National Broadband Strategy determining specific development directions. Consequently, Hungary is somewhat behind the countries where the development of broadband services has been a serious state priority for years, yet the country may possibly be able to make up for that.

Our disadvantages in infrastructure are probably less serious than many of us would think. Fix communication networks are well-developed, broadband xDSL access is available in the majority of Hungarian cities. Cable penetration is about 55 percent, which is quite close to the EU average, and even though some of these networks do not yet offer broadband Internet access, improvements are implemented continuously. The number of broadband Internet subscribers reached 300,000 in Fall 2004, sixty percent of which is xDSL, and the ratio of cable subscriptions is about

forty percent (*Figure 8*). The only significant problem about the infrastructure might be that while there is a competition between the various platforms in larger cities, no sign of broadband infrastructure development can be detected in less profitable, sparsely populated areas. This is a classic case of market failure. The widening of the gap between these regions and the rest of the country could only be stopped through appropriate government intervention.

Figure 8: *Internet subscriptions in Hungary (Q1 2002 – Q3 2004)*



Note: Broadband subscriptions include xDSL, cable and leased line contracts

Source: Távközlés, Internet (KSH quarterly reports)

The case is quite different for content development. The small size of the market does not only influence the profitability of content development for digital television but that for the Internet, as well. The returns of content development in Hungarian cannot be guaranteed if penetration is low, and at the same time, the lack of valuable Hungarian content may deter consumers from subscribing to a broadband service. The situation of broadband Internet content provision was demonstrated by the total lack of interest of market actors experienced between 2000-2002 by the authors of the first academic online video study (Gálik et al. 2003). The situation has improved by now, of course. Axelero, for example, launched its video-on-demand service in December 2004. The service enables consumers with a broadband access to choose a

movie from the virtual library of the company whenever they would like to. They cannot download the movie, yet they may view it as many times as desired within 24 hours of the purchase, and they may pause the movie, as well. An indicator of the convergence of devices is that the movie cannot only be viewed on the computer's monitor but on the television set, as well, using a simple converter plug – thus the experience of traditional family programmes does not have to be forgotten, either.

Market development, however, may not only be interpreted as related to state participation or the supply side. The reaction of the demand side, the formation of new consumer habits is at least as important as the previous factors. It is a well-known fact that the level of digital literacy in Hungary is very low, a lot of people are averse to the Internet and other new technologies. Another issue is that the subscription packages offering unlimited access and almost unlimited downloads primarily have been offering advantages for the so-called heavy-users, the continuous downloads of whom have enabled the utilisation of the capacity that was already included in the flat rate tariff. Some sources say that in 2005, the largest providers (Matáv, UPC) are going to introduce non-flat-rate broadband packages, with the fees being proportional to the amount of downloaded data. Such a new opportunity may attract people, who do not use the Internet too much at home because, for example, they have a continuous, high-speed access at the workplace, but when they do, they are willing to pay for the comfort of high-speed access. The strategy of providers, the new packages and favourable pricing techniques may lead to a spectacular market expansion even in the short run.

For the time being, however, it is also possible that the most popular platform of broadband services will not be the computer, but rather some other device the everyday use of which consumers are already accustomed to. The decision about third generation (UMTS) licence at the end of 2004 may open up new perspectives in mobile communication, and the introduction of digital television certainly offers some opportunities, as well. Thus the competition between various technologies and the different platforms is still open. What is sure is that the changes in consumer habits, and the ability to use the devices may be a decisive factor in the course of the competition.

The development of broadband Internet access provision will certainly continue even though it may not be very fast. The increasing number of subscribers is expected to

motivate content developers, too. Hungary should capitalise on the fact that the gap between Hungary and the EU in telecommunications is not all that wide, and there is a layer, basically distinguished by age, for which the everyday use of the Internet is already evident. The EU accession means a unique opportunity for us to make high investments in less developed regions and make them more competitive. Considering the information society strategy of the EU, one of the cornerstones of this process may be the development of broadband infrastructure. It is still a question to what extent we will be able to capitalise on the various opportunities, and whether the content development market will keep in line with infrastructure development. Surely enough, these depend on the willingness to pay and the characteristics of market segments.

6.3 Hypotheses about broadband users

The purpose of the research on which this dissertation is based was the investigation of the market of new media services. Technological development, the appearance of new platforms and the changes in consumer habits brought about changes in the value chain and the formation of previously unknown business models.

The completion of the primary research was hindered by the fact that the majority of interactive television services are not yet available in Hungary (there are only a very few exceptions, like the electronic programme guide service included in the UPC Direct package). At present time, there is no company in Hungary with a core competence in the development, packaging or distribution of interactive contents, and high value added services are not available, either. Consequently, I decided to reject the idea of a supply side empirical research.

This is the reason why the primary research examines the demand side, why hypotheses try to express consumption characteristics. As the interactive services of digital television are practically unavailable in Hungary, the empirical study investigates broadband Internet subscribers, namely those contracted with the largest cable company. The research is built upon the basic assumption that in a developed infocommunication environment, interactive services are available through a number of different platforms. Thus the adoption and the use of these services are not primarily determined by the type of the network. Therefore the investigation of the

characteristics of broadband Internet subscribers may provide further information on the more widely interpreted interactive services market and on diffusion possibilities.

> **H_1**: The appearance and diffusion of broadband services is the result of continuous development, it cannot be separated from the diffusion of Internet use, which started in the nineties. The characteristics of the so-called innovators and early adopters of Internet use can also be identified for those of broadband services.

The hypothesis presumes that early subscribers of broadband services have the same demographic characteristics as early (phone modem) Internet subscribers a few years ago. They are typically young, have a high qualification and work as leaders – just like it could be observed in the early stage of the diffusion of the Internet.

> **H_2**: Broadband subscribers' use of the Internet is intensive and extensive, they use the web quite a lot and they use it for diverse purposes.

The hypothesis deals with the usage habits of broadband subscribers, considering both entertainment and information contents, and other applications, as well (telework, for example).

> **H_3**: The ICT penetration of households with a broadband subscription is favourable: typically, they own more than one PC and they have more consumer electronics devices (VCR, DVD player, CD player, play stations) than the average.

This question examines the ICT (infocommunication technologies) penetration of households with a broadband subscription.

> **H_4**: A well-differentiable group of broadband subscribers is willing to play a role in content development (creates an own homepage, where they regularly post their own contents).

The fourth hypothesis investigates the so-called *prosumer* phenomenon, typical for interactive media consumption, and the willingness of people to act accordingly.

> **H_5**: In broadband households, the Internet, as compared to traditional media (newspapers, radio, television), has a central role in the satisfaction of users' everyday need for information.

H_6: In broadband households, the television viewing habits of the main user significantly differ from the average, considering the amount of time spent on watching television and the channels viewed, as well.

The last two hypotheses are intended to assess the media consumption patterns of broadband households in order to find consumption characteristics which differ from the average.

Using these hypotheses, it is my intention to prove that the use of broadband Internet on the individual's level is the result of a process. The transition from a *couch potato* to a *desk potato* (see section 5.1) cannot happen from one day to another. It is not independent of external factors, but there are some by-phenomena like the ownership of a large number of ICT tools, non-average traditional media consumption patterns, and participation in Internet content development. We will certainly not be able to answer certain 'chicken or the egg' questions (e.g. was it the non-average traditional media consumption pattern that made a given person subscribe for broadband Internet or was it the extensive use of the Internet that induced a particular consumption pattern), however, this is not the primary aim of this research project, either. I would like to get to know the characteristics of the innovators and the early adopters of this market instead.

The main research question to be analysed is whether the usage patterns, the demographic and the media consumption characteristics of broadband subscribers are homogeneous or contrariwise, there are significant differences.

RQ: Can different user groups be identified based on their Internet usage or do the subscribers of broadband services constitute a more or less homogeneous group during the early stage of diffusion?

The study would also like to determine the impact of broadband Internet access on media consumption patterns. At the same time I will attempt to predict the impact of further expansion in the broadband market on the structure of traditional media industries. One will only be able to confirm or reject these findings in the relatively distant future. Nevertheless, this paper is intended neither to describe long-term market processes nor to prove the correctness of these descriptions empirically.

7. Empiric research

7.1 Methodology

The primary research of the dissertation is based on an electronically distributed questionnaire survey among the broadband Internet (*chello*) subscribers of the cable company UPC. Users could get to the questionnaire by clicking on the link in the email they received, and it could be completed simply and quickly. Originally, there were 37 questions, but for technical reasons no data was recorded for two of them. Thus finally, the answers to 35 questions were processed.

The e-mails were sent on April 22, 2004 and the database was closed on June 28, 2004. Thus data collection took somewhat more than two months.

Exactly 48,011 questionnaires were sent out, and 9,849 were returned, which adds up to a response ratio of 20.5 percent. The high response ratio may partially be ascribed to UPC having offered to respondents five half-year chello subscriptions as a prize. In order to be eligible to participate in the draw, respondents had to provide some personal data (name, address, e-mail address), however, the questionnaire could also be returned anonimously, of course.

The final sample size turned out to be somewhat smaller, namely 9,771 due to the following two reasons:

1.) Responses, where the default answer was provided for all of the below four questions were removed from the sample:

- When did you start using the Internet? *(default answer: 1985)*
- When did you start using the Internet at home? *(default answer: 1985)*
- Does your household own a cellular phone? *(default answer: no)*
- Your year of birth? *(default answer: 1930)*

2.) Responses which were submitted directly after each other with the same content were also removed from the sample. (A few respondents submitted the completed questionnaire several times, either by coincidence or because they wanted to increase their odds of winning the prize.)

Submitted data were processed with the SPSS software.

It is important to note that this sample is not representative of Hungary's population or the portion of the population using the Internet. The *chello* service is only available in certain geographic areas, and a rather significant part of the population is excluded from consumption due to its price. Nevertheless, it is a general characteristic of Internet surveys that representativity cannot be achieved, since Internet access has not been a mass product. Significant groups of the society do not use the Internet, thus they are not represented in these surveys, either. Because of the geographically limited availability of cable Internet access, our study is not necessarily representative of the broadband Internet audience, either.

7.2 Sample frequencies

7.2.1 Demographic composition

The demographic composition of the sample largely differs from that of Hungary's population. Due to the aforementioned reasons representativity could not have been a requirement, still it is worth looking at the characteristics of the community of broadband Internet users. It is particularly apparent that the distribution of the variables differs from the findings of other, less technology-specific Internet surveys (see for example Angelusz-Tardos 2004).

The ratio of male respondents to female respondents is 72.7 percent vs. 27.3 percent. This is somewhat surprising as recent studies about the Internet showed a more balanced male-female composition. Our ratio rather resembles the early stages of the Internet era. This is a difference between the use of broadband infrastructures and Internet use in general.

The age distribution of the sample reveals the dominance of 18-49 year olds and especially the 18-29 year olds. This is not very striking, as it is a well-known fact that there are enormous differences between the Internet usage patterns of the various age groups.

The sample's distribution by qualification and profession supports that the use of the Internet, and especially that of broadband Internet is a manifestation of the digital divide. Almost half of the sample holds a higher education degree, whereas the ratio of those with a higher education degree amongst all 25-64 year olds in 2004 Hungary was as low as 14 percent (KSH, 2004). It is known, however, that status variables

(like qualification, income, profession) do not influence Internet usage on their own, but they are closely related to each other, as well.

Considering the distribution by place of residence, one has to take into account that the survey was completed by the subscribers of a single cable company, therefore the variable primarily reflects the expansion strategy of the company in question. Anyhow, this may call our attention to the huge differences in the availability of state-of-the-art infrastructures, which must be considered when developing governmental *policies*.

Table 2: *Demographic frequencies of the sample*

	SAMPLE FREQUENCY (PERCENT)
GENDER	
Male	72.7
Female	27.3
AGE GROUPS	
14-17 years	1.9
18-29 years	31.9
30-39 years	27.3
40-49 years	20.0
50-59 years	14.2
60+	4.8
EDUCATION	
primary	4.6
industrial	8.4
secondary	37.6
high	49.4
PROFESSION	
owner, entrepreneur	20.2
self-employed intellectual	6.0
employed intellectual	29.7
manual worker	3.1
other employee	21.1
student	12.6
retired	5.2
housewife	2.2
TYPE OF SETTLEMENT	
Budapest	55.8
large town	29.6
small town	13.1
village	1.5

The sample composition does not reveal too much, yet it is apparent that what we have here is a very special segment. Its demographic characteristics imply that the average *chello* user is a young, high-status male living in a town.

7.2.2 Internet usage

Questions on Internet usage were not primarily related to the utilisation of the communication possibilities offered by the network but rather to its application as a mass communication medium.

Table 3: *The use of the Internet as a mass communication medium*

	SAMPLE FREQUENCY (PERCENT)
VISITING NEWS PORTALS	
practically each day	71.0
once or twice a week	11.9
occasionally	15.5
never	1.6
VISITING TELEVISION PORTALS	
practically each day	15.7
once or twice a week	13.0
occasionally	51.2
never	20.0
LISTENING TO ONLINE RADIO	
practically each day	8.7
once or twice a week	8.1
occasionally	39.3
never	43.9

Sample members particularly often visit news portals, especially Hungarian ones. The portals of the most popular medium, that is television, are by far less popular, the majority only views them occasionally. One of the reasons for examining this matter was that researchers tend to express the expectation that the significance of television portals will sooner or later become comparable to that of the channels, especially considering brand building and the creation of consumer loyalty (Swann 2000).

Internet radio is becoming increasingly popular, thousands of channels are available on the web by now. Even though there are not too many people listening regularly to

such stations, it is rather surprising that more than the half of respondents listens to some Internet radio station at least occasionally.

Table 4: *Activity variables in the sample*

	SAMPLE FREQUENCY (PERCENT)
DOWNLOAD	
several times a week	28.6
several times a month	23.6
occasionally, a few times each year at most	33.2
never	14.7
PAY CONTENT	
yes, several times	23.8
yes, tried it only once	8.7
never	67.5
TELEWORK	
several times a week	45.3
several times a month	16.0
occasionally, a few times each year at most	20.0
never	18.8
OWN HOMEPAGE	
yes, self-made	18.1
yes, but not self-made	4.5
no	77.5

It was investigated specifically to what extent consumers capitalise on the interactive nature of the web, on the opportunity to purchase individually compiled contents. *Table 4* shows that the vast majority of users have already downloaded some kind of content from the web, what is more, they tend to do it pretty often. (The question was specifically about contents, for example video and music files or games. Other types of downloads, like updates for the antivirus software, were not considered.) Paying for contents is far less popular, which is not much of a surprise. This ratio is still astonishingly high if we consider that this question was about contents, too – thus ordering a pizza or a book online did not qualify.

The preparation and the operation of own homepages implies the existence of the *prosumer* phenomenon, thus the existence of consumer-developed contents. Almost one fourth of the sample has an own homepage, which indicates that many are

interested in content development. The activity of users is also supported by regular teleworking, even though this is not related to media content.

7.2.3 ICT penetration in households

Previous research implied that there is a relationship between the ICT penetration in households and Internet usage. People's interest in new technologies and the acceptance of innovations does not usually relate to a specific product or service but to a rather wide range of them. Internet users typically own quite a number of various infocommunication devices.

Table 5: *Penetration of infocommunication technologies in the sample*

	SAMPLE FREQUENCY (PERCENT)
Television	96.7
VCR	84.6
DVD-player	56.0
CD-player	84.7
Play station	14.0
Cellular phone	98.8

It tells a story about the sample that the number of households with a cellular phone is higher than that of households owning a television set. The percentage value (96.7) of households with a television set is somewhat below the population-wide figure, yet the difference is not significant. According to AGB Hungary, the ratio of Hungarian households holding a television set was 98.2 percent in 2004, while National Media Analysis yielded 99 percent for H1 2004.

The mobile phone penetration of 98.8 percent is particularly high, this is clearly above the country-wide average. National Media Analysis published 64 percent for H1 2004, while Tárki measured 67 percent in Fall 2003 (Szívós-Tóth, 2004).

The sample's figures for various entertainment devices (VCR, DVD, CD, play station) are very high, too. Comparative data are shown in *Table 6*.

Table 6: *Penetration of some entertainment devices in households 2003-2004*

	TÁRKI October 2003	NATIONAL MEDIA ANALYSIS H1 2004	TÁRKI September 2004
VCR	55	62	56
DVD-player	7	n.a	17
CD-player	n.a	46	n.a
Play station	n.a.	n.a	5

Source: Szívós, P. – Tóth, I. Gy. (szerk.) (2004): Stabilizálódó társadalomszerkezet. Tárki Monitor Jelentések 2003., GfK Hungária – Szonda Ipsos (2004): Nemzeti Médiaanalízis. I. félév., ITHAKA-ITTK-Tárki: A digitális jövő térképe 2004.

The mere fact that the penetration of entertainment devices in broadband households is higher is not very surprising, since they represent a segment of a more favourable financial status and they are not averse to modern technologies, either. The extent of the difference is, however, strikingly large. It is therefore obvious that our sample differs significantly from the average.

Table 7: *Number of computers in respondents' households*

	SAMPLE FREQUENCY (PERCENT)
1 computer	55.6
2 computers	29.9
3 or more computers	14.4

In international comparison, the penetration of computers in Hungarian households is extremely low, which is probably one of the reasons why the number of computers is not a popular research topic. Interestingly, nearly half of sample households owned more than one computer.

7.2.4 Media usage patterns

It seems a reasonable assumption that the media usage pattern of broadband Internet subscribers differs from that of the wide public without an Internet access. Considering that sample members spend 3.6 hours a day using the Internet on average, one may guess that their spare time activities, and thus their media usage patterns also differ from the average.

A much higher percentage of sample members read quality newspapers than tabloid papers. (The expression 'quality newspaper' is used according to its established meaning, even though we all know that no Hungarian newspaper is comparable to e.g. Le Monde or New York Times in quality and prestige). The figure measured for business newspapers (20 percent) is exceptionally high, which again points out the extraordinary composition of our sample. Data for regional newspapers and free newspapers, given the geographical limitations to their availability, do not really allow for far reaching conclusions.

Table 8: *Newspaper reading habits of respondents*

	SAMPLE FREQUENCY (PERCENT)
NEWSPAPER READING	
quality newspaper	44.0
tabloid newspaper	30.4
regional newspaper	27.8
business newspaper	19.7
free newspaper	35.8
CHANGES IN NEWSPAPER READING HABITS	
reads more than before broadband	2.2
reads less than before broadband	34.2
reads the same amount, but different newspapers	8.9
reading habits have not changed	54.7

National Media Analysis for H1 2004 pictures a rather different situation. The reading of quality daily newspapers is between 0.9 – 6.0 percent (Népszava: 0.9%, Magyar Hírlap: 1.0%, Magyar Nemzet: 2.4%, Népszabadság 6.0%). Even the sum of these figures hardly exceeds 10 percent, having ignored the impact of the cross-reading phenomenon, which is 3-32 percent in the audited segment. Thus the national average ratio of those reading quality newspapers is below 10 percent.

During the period in question, Blikk was the only tabloid included in National Media Analysis, its reading amounted to 12.4 percent. This single figure is higher than the sum total of quality newspapers, yet this is not unique to Hungary. Recent years have witnessed the market expansion of tabloid press throughout Europe. In our sample,

however, the reading of quality newspapers exceeded that of tabloid papers, which again confirms that these people constitute a special segment.

National Media Analysis measured the reading of business newspapers to be below 1 percent (Napi Gazdaság: 0.3%, Világgazdaság: 0.4%, cross reading was 23% and 26% respectively). The reading of regional newspapers was 0.4-2.9 percent, while Metro achieved 5.8 percent. For regional newspapers and Metro, however, one has to take into account that our sample is not geographically representative of the population, which certainly does influence the reading of non-nationwide newspapers.

We may conclude that newspaper reading habits do significantly differ from the average. Though the difficulties arising from methodological differences are not negligible, the differences between the respective figures are far too large to be ascribed to methodological reasons only. Broadband Internet subscribers were found to be extraordinarily fond of newspaper reading, and the composition of the press products read was rather interesting, too.

Special attention should be paid to the changes in newspaper reading patterns: one third of the respondents reads less than before they purchased a broadband access, and only a negligible minority admitted to read more than before. This is especially important because of the fact that reading habits are formed during one's youth, thus the experts forecasting reading habits to change radically in the long run as a result of the Internet may possibly be right.

Television viewing habits were assessed by asking respondents to name the most frequently, the second most frequently and the third most frequently viewed channels. In line with other surveys on the television viewing habits of the wide public, the dominance of commercial channels was obvious, yet the popularity of thematic channels was conspicuous, as well. An important remark is that the sample primarily included multichannel households, that is the cable infrastructure was available everywhere (it is possible, of course, that some of the households only had a subscription for broadband services and not for cable television, or they chose the basic package which includes just a couple of channels).

Table 9: *Television viewing habits of respondents*

	SAMPLE FREQUENCY (PERCENT)
TELEVISION VIEWING	
mentioned some public channel(s)	36.7
mentioned some commercial channel(s)	79.7
mentioned some documentary channel(s)	27.5
mentioned some movie channel(s)	18.6
mentioned some sports channel(s)	14.5
mentioned some news channel(s)	8.3
mentioned some music channel(s)	4.2
CHANGES IN TELEVISION VIEWING HABITS	
watches more TV than before broadband	1.0
watches less TV than before broadband	48.5
the same time, but different programmes	7.4
viewing habits have not changed	43.1

It is apparent that television viewing habits were restructured by broadband Internet to an even greater extent than newspaper reading patterns. The amount of time spent watching television was 2.3 hours per day, which is far less than the time spent using the Internet. According to the data of AGB Hungary, an average Hungarian consumer owning a television set spent approximately 4 hours watching television during this period, namely May 2004. If, however, we only consider 18-49 year-olds (constituting some four fifths of the sample), the time spent watching TV is reduced to 3.6 hours. Yet the figure is even lower, namely 3 hours, for the 18-29 year-olds, the age group that was most represented in the sample (AGB Hungary, 2004). I have to add, however, that a direct comparison of data from the online questionnaire survey of broadband users with those measured by AGB Hungary would be inappropriate due to some methodological differences. (AGB Hungary measures the television audience by peoplemeter system.) Comparative data, therefore, may only serve illustrative purposes.

About the half of respondents said that they spent less time watching television than before. This is particularly interesting in the light of the fact that the development of Hungarian-language network video contents has not yet really started because of the small number of subscriptions. This is certainly going to change with increasing penetration, as evinced by the launch of Axelero's VOD service. It is without doubt that Hungarian broadcasters will have to reckon with competition from broadband networks.

7.3 Factor analysis

Through the questions on Internet usage habits, I tried to establish factors which describe certain usage dimensions. All previous research results support that the various applications of the Internet are not independent, thus I also attempted to find the relationship between the different types of use.

After having tried several sets of variables and methods, 16 variables were investigated applying the principal component analysis and Varimax rotation. The result of KMO (Kaiser-Meyer-Olkin) test exceeds the benchmark value of 0.5, and Bartlett's test of sphericity yielded a significant result, as well.

Table 10: *KMO and Bartlett's test results for the factor analysis*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.673
Bartlett's Test of Sphericity	Approx. Chi-Square	13744.556
	Df	120
	Sig.	.000

Communality is the total amount of variance an original variable shares with all other variables included in the analysis (Malhotra, 2002). It is apparent that communalities are rather high, the only exception being telework with a value below 0.3.

Table 11: *Communalities of the factor analysis*

VARIABLE	*INITIAL*	*EXTRACTION*
When did you start using the Internet?	1.000	.744
When did you start using the Internet at home?	1.000	.720
How much time do you spend using the Internet?	1.000	.355
Visiting news portals	1.000	.543
Hungarian news portals	1.000	.496
Foreign news portals	1.000	.408
TV portals	1.000	.488
Internet radio	1.000	.381
Telework	1.000	.286
Homepage: personal, photo	1.000	.454
Homepage: hobby	1.000	.429

Homepage: art	1.000	.358
Homepage: science	1.000	.324
Self-made homepage	1.000	.652
Content download	1.000	.519
Has paid for content	1.000	.484

As a result of the factor analysis, five factors were formed, explaining 47.75 percent of total variance. The factors explain 11.5 percent, 10.2 percent, 9.7 percent, 8.4 percent and 7.9 percent of total variance, respectively.

Table 12: *Rotated factor matrix*

	COMPONENT				
	1	*2*	*3*	*4*	*5*
When did you start using the Internet?	.089	**.842**	.030	.160	-.009
When did you start using the Internet at home?	.078	**.842**	.024	.063	-.008
How much time do you spend using the Internet?	**.**186	-.045	**.431**	**.359**	.056
Visiting news portals	-.047	.177	.034	.170	**.693**
Hungarian news portal	.172	-.019	-.174	-.290	**.593**
Foreign news portal	-.065	.114	.033	**.620**	-.065
TV portal	-.117	-.208	.231	.089	**.608**
Internet radio	.029	-.045	**.477**	**.347**	.172
Telework	.020	.239	.112	**.438**	.157
Homepage: personal, photo	**.642**	.116	.121	-.085	.077
Homepage: hobby	**.644**	-.005	.123	.007	-.009
Homepage: art	**.486**	-.091	-.097	**.322**	-.023
Homepage: science	.277	.001	-.172	**.467**	-.006
Self-made homepage	**.762**	.176	.155	.098	-.084
Content download	.151	.007	**.704**	-.016	-.009
Has paid for content	.039	.117	**.667**	-.153	-.015

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 7 iterations.

The factors describe relatively characteristic types of use:

Factor 1: 'prosumer' phenomenon

- homepage building
- homepages usually contain personal information, photographs, pieces of art, and contents related to hobbies

The expression *prosumer* stands for the consumer attitude which includes both the consumption and the development of contents. As it can be seen, the factor also includes some other consumption-related variables (e.g. visiting Hungarian news portals, content download), yet content development is its most significant element. Time spent using the Internet achieved a relatively low but still positive value.

Factor 2: innovator attitude

- has been using the Internet for a long time
- has had home Internet access for a long time

This factor is characterized by the early use of the Internet rather than some specific usage habits. Respondents for whom the weight of this factor was high were the Hungarian innovators of the Internet. Apparently, they do use a number of applications (visiting news portals, telework, homepage building), however they do not spend too much time on the web. The period of initial enthusiasm and the joy of novelty is probably over for them. They are rather characterized by the functional use of the Internet, as an integral part of their everyday life.

Factor 3: 'heavy usage' phenomenon

- spends a lot of time on the web
- listens to Internet radio stations
- downloads contents, purchases pay content

One of the findings of a number of Internet surveys was that there is a group of users totally 'obsessed' with the Internet. They spend their spare time surfing the web, try a wide range of applications, and they usually possess the necessary technical skills, as well. Our results lead to the conclusion that this type of use can be identified in this case, too. Besides the characteristics mentioned above, they also visit television portals, build homepages and take advantage of telework opportunities. Sample members with a high factor weight have not been using the Internet for a very long time, thus one might suppose that they are driven by a kind of initial enthusiasm.

Factor 4: professional usage

- spends a lot of time on the web
- visits foreign news portals
- listens to Internet radio stations
- telework
- own homepage with pieces of art or scientific content

The factor represents a wide variety of usage types, but it still markedly differs from the heavy-usage group. This is an expressly 'critical' type of consumer attitude. The Factor 4 possibly represents some kind of a cultural elite. Especially telling is the very high positive value associated with foreign news portals and the relatively low negative value in the case of Hungarian news portals. Accordingly, respondents with a high factor weight for this factor expressly prefer foreign news portals to Hungarian ones.

Factor 5: inquirer

- visits Hungarian news portals
- visits television portals

Factor 5 describes a rather moderate, simple type of use. Besides the interest for news, telework and Internet radio were the only items to achieve a positive value, yet these were not particularly high, either. Amongst all five factors, this one achieved the lowest values for the 'When did you start using the Internet' and the '...using the Internet at home' variables, thus they are likely to have entered the broadband Internet market last (considering the sample at least – in comparison to Hungarian society as a whole, these people may still be regarded to be some kind of innovator).

Summing up the above, we may state that in spite of the small number of Internet usage variables, rather characteristic factors could be formed. Henceforth I am going to investigate the demographic indicators, the media consumption patterns and the ICT penetration indices of these factors. Furthermore, it will be examined whether there is a difference between the various types of users as related to their first encounters with the Internet, to their early experiences. All results are significant unless stated otherwise in the analysis.

7.4 Characteristics of user types

7.4.1 Demographic characteristics

Our factors do not only outline different user types, but consequently they also define the consumer groups characterized by those types of use. It is worth examining, therefore, what demographic figures are characteristic for each factor. For the ease of understanding, individual (gender, age, education, profession) and household-level (type of settlement, number of household members, number of household members below the age of 20) variables are shown separately. In the text, however, they are analysed simultaneously.

Prosumer factor

This factor consists primarily of males, and the dominance of the youth is apparent, as well. It probably follows from their age that the ratio of those with a primary school qualification is very high, which implies that many of the sample members with a high factor weight are high school students. The high school certificate category also achieved a positive value. One may possible presume that many of them are university students. This idea is supported by the fact that the student category of the profession variable received an extremely high positive value. All other profession categories except for self-employed intellectuals have negative figures, thus the factor primarily includes students.

Considering household-level variables, trends are not as clear as above. The number of household members and the number of young household members did not yield a significant result. Budapest-orientation, however, is indicated by the fact that the capital was the only type of settlement to receive a positive value.

Shortly summarized, the majority of the sample members with a high factor weight in this factor were students. Their Internet activity, and the so-called prosumer phenomenon are highly probable to be largely influenced by their age.

Table 13: *Averages of Internet usage factors by demographic variables (individual)*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
GENDER						
male	7093	.088	.089	.102	.007	-.018
female	2659	-.232	-.237	-.273	-.020	.048
AGE GROUPS						
14-17 olds	184	.480	-.482	.717	.025	-.314
18-29 olds	3110	.250	-.005	.327	.070	-.134
30-39 olds	2658	-.033	-.043	-.004	-.089	.038
40-49 olds	1954	-.158	-.014	-.181	-.063	.092
50-59 olds	1380	-.254	.113	-.414	.060	.123
60+ olds	466	-.265	.194	-.494	.117	.059
EDUCATION						
primary	449	.321	-.364	.485	-.019	-.236
industrial	817	-.001	-.507	.382	-.156	.108
secondary	3670	.060	-.144	.152	-.074	-.006
high	4824	-.075	.230	-.228	.084	.008
PROFESSION						
owner, entrepreneur	1973	-.059	.167	-.088	.053	.060
self-employed intellectual	584	.060	.192	-.098	.444	-.060
employed intellectual	2899	-.057	.169	-.193	.006	.032
manual worker	298	-.103	-.506	.266	-.220	-.047
other employee	2056	-.034	-.283	.195	-.186	.026
student	1226	.389	-.080	.356	.116	-.235
retired	510	-.220	-.033	-.203	-.053	.117
housewife	214	-.082	-.384	-.145	-.234	.071

Innovator factor

Again, male users seem to be rather determinative, what is more, the value itself is very similar to that of the prosumer factor, too. An important difference is, however, that in this case, higher ages received the positive value, and lower ages the negative one; thus elder people are represented with a higher weight in this factor. The high qualification of the sample members is rather apparent from the particularly high value of higher education degrees, and the very low value of the primary school category. This is also supported by the profession variable, owners/entrepreneurs,

self-employed intellectuals and employed intellectuals having received positive values.

Considering the place of residence, the dominance of Hungary's capital is obvious. This is the factor where villages, small towns and large towns received the lowest negative values, while Budapest achieved a high positive value. Concerning the number of household members, single-member households may be considered typical. Thus it is not very surprising that the representation of household members below the age of 20 is very low in this factor.

Summarized, sample members with a high weight in the innovator factor are of a high status, they have a higher education degree and they are either managers or self-employed intellectuals. Typically, they live in the capital, in small – often single-member – households. The questionnaire was not intended to contain any question on respondents' financial status, yet one may certainly assume that these sample members are particularly well-off, even compared to the average broadband subscriber.

Heavy usage factor

Male dominance is the most apparent in the heavy usage factor. Their age is rather uniform, too: they primarily belong to the youth. Consequently, they typically have a primary school qualification. Surprising is, however, that the manual worker category received a markedly high value for this factor. This means that the factor is not only characterised by young students but also by people who have already finished their studies, yet at some lower qualification level. The results for the profession variable also support this statement, with students, manual workers and other employees all having achieved relatively high values.

The household variables give us more information. Here, small towns are to receive the highest value (those of large towns and villages are also positive, yet smaller). It may be a reasonable assumption that the place of residence has a great role in the development of people's Internet usage habits. The lack of entertainment alternatives may very well be driving the youth towards the Internet. A difference between people's way of life in the capital and that in the countryside may be indicated by the fact that small households are not at all characteristic for this factor. What is more,

this is the factor where the presence of large households and household members below 20 is the most apparent.

Consequently, the heavy usage factor primarily represents young males from the countryside, who are still studying or who have just finished their studies. Sample members with a high factor weight do not have a higher education degree, their status is typically not very high (as compared to the sample as a whole – of course, these users may well be highly respected, high-status opinion leaders in their own community).

Professional usage factor

As it is implied by the data, this factor is not as 'well-defined' as the previous ones. The investigation of respondents' gender did not yield a significant result. In the case of the age and education variables, no one of the categories received a particularly high or particularly low score, even though the higher education degree may possibly be considered somewhat characteristic. Considering their profession, however, self-employed intellectuals achieved a very high value, which indicates that sample members with a high factor weight use the computer and the Internet when working at home, as well. Similarly, the students' score is above 0.1, thus the factor certainly includes some users who surf the Internet for information needed for their school assignments.

Considering the household variables, single-member households are rather typical, again. Yet, interestingly, the largest (six or more household members) category received a positive score, too.

Shortly summarized, it is apparent that this factor cannot be described by demographic variables as precisely as the previous ones. Results show that a high factor weight is characteristic for self-employed intellectuals for whom the use of the Internet is a means of doing their work. Nevertheless the factor also includes some students the usage habits of whom are not included in any one of the previous factors. Probably, their use of the Internet is of a rather functional nature, presumably as a means of finding information related to their studies.

Table 14: *Averages of Internet usage factors by demographic variables (household)*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
TYPE OF SETTLEMENT						
village	146	-.152	-.372	.019	.066	-.184
small town	1277	-.025	-.305	.128	-.040	.018
large town	2893	-.051	-.174	.044	-.063	.086
Budapest	5444	.038	.174	-.055	.040	-.045
NUMBER OF HOUSEHOLD MEMBERS						
1 person	764	-.049	.179	-.105	.134	-.010
2 persons	2652	-.001	.064	-.033	.038	-.024
3 persons	2682	.009	-.049	.019	-.014	.004
4 persons	2677	-.005	-.032	.012	-.058	.016
5 persons	712	.049	-.040	.067	-.040	.003
6 or more persons	262	.008	-.236	.137	.057	.059
NUMBER OF HOUSEHOLD MEMBERS BELOW THE AGE OF 20						
0 person	5517	.009	.068	-.025	.052	-.022
1 person	2299	.011	-.073	.039	-.048	.009
2 persons	1594	-.024	-.122	.000	-.102	.058
3 or more persons	340	-.073	-.047	.132	-.049	.015

Inquirer factor

This is the only group where the value for males was negative, while that of females was positive. Even though these values are rather low, the result is significant, the high factor weight of female users is absolutely obvious. Considering age groups, basically elder users got high values in this factor. The qualification variable is not suitable to draw any kind of conclusion from. What is interesting, however, is that there are two profession categories, which achieved a positive value only for this factor: retired people and housewives.

There is no clear trend considering the type of settlement, while the results for the household variables were not significant. However, it is possible that some of the users in this factor were taught by family members on how to use the Internet, while their activities are still limited to the simplest function: searching for news.

The inquirer factor, just like the previous one, cannot be appropriately described by demographic variables. It is a matter of fact, however, that the representation of elder age groups is rather typical, and that pensioners and housewives are present, as well.

7.4.2 ICT-penetration in households

The penetration of infocommunication technologies does not relate to individuals but rather to households, therefore it is of limited use to our research. Still, it may be worth looking at whether there are any tendencies in ICT-penetration for the various usage factors.

Table 15: *The average of Internet usage factors by ICT-penetration variables*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
NUMBER OF PCS IN THE HOUSEHOLD						
1	5431	-.046	-.205	-.005	-.080	-.001
2	2919	.038	.164	.013	.036	.005
3 or more	1399	.099	.451	-.005	.230	-.009
OWN A TV SET?						
no	323	-.384	.119	.675	.723	-1.545
yes	9445	.013	-.004	-.023	-.025	.053
OWN A VCR?						
no	1508	.021	.021	.185	.240	-.340
yes	8260	-.004	-.004	-.034	-.044	.062
OWN A DVD PLAYER?						
no	4296	-.034	-.081	-.094	.005	-.090
yes	5472	.027	.063	.074	-.004	.071
OWN A PLAY STATION?						
no	8402	.006	.035	-.036	.004	-.020
yes	1366	-.034	-.217	.224	-.023	.121
OWN A CD PLAYER?						
no	1494	-.039	-.059	.099	.066	-.336
yes	8274	.007	.011	-.018	-.012	.061
CELLULAR PHONE IN THE HOUSEHOLD?						
no	118	.093	-.075	-.210	.234	-.007
yes, but none of them is wap- or mms-capable	3705	-.014	-.095	-.157	-.010	-.040
yes, and some of them are wap- or mms-capable	5945	.007	.061	.102	.002	.025

Results show that the presence of several PCs in the household is primarily characteristic for the innovator factor. As they have had an Internet subscription for a long time, they probably needed better and better computers as data transfer speeds soared, thus it is not very striking that there are several computers in their household. Our findings were quite similar – even though with somewhat lower values – for the professional usage factor.

One should be rather careful when interpreting the results on TV sets, as the number of households without a TV set seems to be much too low (323 cases). Still, all results except for the innovator factor proved out to be significant. According to the data, a life without a TV set is most typical in the case of the heavy usage and the professional usage factor.

This is also supported by the data on VCRs. The frequencies are more balanced, yet the very same two categories are characterised by the non-possession of a VCR. We have to add, however, that the prosumer and the innovator factors did not yield a significant result in this case.

There is no clear trend for DVD players, even though the results are significant, except for the professional usage factor.

The possession of a play station is most characteristic for the heavy usage, and least characteristic for the innovator factor. This is obviously related to the fact that – as mentioned earlier – young sample members had a higher factor weight for the former factor, while elder respondents for the latter one. The results for the prosumer and the professional usage factor are not significant.

Considering CD players, the inquirer factor was the only one to achieve a value above 0.1, yet this factor is characterised by rather high penetration values for all ICT-devices. The results for the prosumer and the innovator factor were not significant.

What concerns cellular phones, the frequency of 'no' answers is relatively high in the case of professional usage, yet this should be treated with caution because of the low number of cases. If we also take into account the technological level of their phones, heavy usage factor seem to prefer modern devices most. The investigation did not yield a significant result for the prosumer factor.

7.4.3 Media consumption patterns

During the analysis, the media consumption habits of our factors, thus of the various types of Internet usage were also investigated. The questionnaire only included questions on newspaper reading and television viewing habits. Radio listening habits were not examined because of its 'background activity' nature. Listening is heavily influenced by external factors like car driving habits or one's possibility to listen to

the radio at their workplace. The market of magazines was not included because of the complexity of this sector. In order to get a correct picture of the magazine reading habits of the sample, there should have been a lot of additional questions, thus the questionnaire would have become too long. For the sake of transparency, newspaper reading and television viewing variables are shown separately in the tables, yet they are analysed collectively in the text.

Prosumer factor

Sample members with a high weight in this factor may not be considered real newspaper readers. The 'yes' answer only achieved a positive value (and the 'no' answer a negative one) in the case of free newspapers, thus the newspaper called Metro seems to be able to reach this consumer group. Considering the question on the change of newspaper reading habits, the value for the 'reads more' category was positive, yet the result was not significant, and neither was the one related to reading tabloid press.

Another finding explained by respondents' age is that from amongst the various television channels, music and – which may be somewhat surprising – cartoon channels were the ones to achieve high positive values. The number of elements, however, is very low in the case of these channels, thus the results should be treated carefully, even if the same tendency prevailed for all the three mentioning. We have to note that in this factor, the time spent on viewing television programmes is low – prosumers, preferring the active lifestyle, do not seem to be interested too much in passively viewing TV programmes.

Shortly summarized, sample members with a high factor weight are characterised by a low willingness to read daily newspapers and a rather moderate amount of TV viewing. Amongst these people, music and cartoon channels tend to be most popular.

Innovator factor

It is apparent that the newspaper reading activity of innovators only covers quality and business newspapers, which supports our earlier statement that this is a high-status group. At the same time, they tend to reject the tabloid press. Sample members in this factor do not read regional newspapers, which may obviously be explained by

the dominance of Budapest orientation by the demographic variables. The question on the change in newspaper reading habits did not yield a significant result.

Concerning television viewing habits, this is the factor with the lowest average amount of time spent on viewing television. Data shows that news channels are viewed primarily, yet public channels and documentary channels are also viewed sometimes.

Table 16: *Average of Internet usage factors by media usage variables (newspaper)*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
READS QUALITY NEWSPAPER						
No	5467	.037	-.111	.135	-.096	-.117
Yes	4301	-.047	.141	-.171	.122	.149
READS REGIONAL NEWSPAPER						
No	7048	.025	.074	-.007	.036	-.058
Yes	2720	-.064	-.190	.018	-.092	.150
READS TABLOID NEWSPAPER						
No	6803	.011	.112	-.064	.023	-.090
Yes	2965	-.024	-.256	.146	-.052	.207
READS BUSINESS NEWSPAPER						
No	7848	.023	-.062	.044	-.053	-.045
Yes	1920	-.095	.251	-.181	.215	.182
READS FREE NEWSPAPER						
No	6275	-.059	.042	-.051	.022	-.034
Yes	3493	.106	-.075	.091	-.039	.060
DID YOUR NEWSPAPER READING HABITS CHANGE?						
reads less	3211	-.007	-.009	.079	.032	.205
did not change	5140	-.007	.007	-.070	-.045	-.160
the same amount, but different things	837	.000	.062	.042	.066	.213
reads more	202	.164	-.181	.212	.382	.249

Heavy usage factor

The newspaper reading habits of respondents with a high weight in the heavy usage factor are similar to those in the prosumer factor. The only significant difference is that this group does read tabloid papers, as well, which is not typical for prosumers.

This might be related to the relatively large proportion of users from the countryside, where the availability of the free newspapers of Budapest and other large towns is rather limited. The question on regional newspapers did not yield a significant result.

Considering television viewing habits, the expressly high viewing amounts were the ones to receive high positive values. This may be somewhat surprising as it means that the extensive use of the Internet and the viewing of television programmes are both typical – thus respondents focus on these two media in their spare time. Which may again support our earlier supposition that the place of residence (typically in countryside for this factor) does indeed influence how people spend their spare time. The lack of alternatives induces an increase in the time spent on media consumption at home.

What concerns channel preferences, cartoon and especially music channels achieved high values for this factor, as well. This may be related to the time spent on TV viewing, as music channels – just like radio stations – are often characterised by 'background consumption'. It is thus possible that the TV and the Internet are often being used simultaneously, therefore there is no contradiction in the fact that people spend much time on both of these two media. However, we have to repeat our remark that because of the low count of elements for music and cartoon channels, results should be treated very carefully even though they actually proved out to be significant. The rejection of public and news channels is absolutely obvious in this factor.

Our findings also show that the impact of the introduction of broadband Internet subscriptions on TV viewing habits was the most significant for this factor. The negative value for the 'did not change' category and the positive one for the 'watches less' category implies that these people spend less time on watching TV now than before – though this figure is still very high.

Table 17: *Averages of Internet usage factors by media usage variables (TV viewing)*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
HOW MUCH TIME DO YOU SPEND WATCHING TV?						
less than 1 hour	684	.337	.374	-.103	.168	-.328
1-2 hours	2675	.013	.117	-.082	.027	-.090
2-3 hours	3065	-.027	-.014	-.051	-.035	.048
3-4 hours	1793	-.071	-.119	.044	-.090	.095
4-5 hours	722	-.076	-.192	.182	.001	.153
more than 5 hours	609	-.009	-.331	.371	.079	.147
CHANNEL MENTIONED FIRST						
public	1113	-.118	.186	-.392	.081	.033
commercial	5661	-.003	-.112	.068	-.090	.107
thematic: documentary	863	.107	.180	-.033	.164	-.255
thematic: sport	504	.026	.045	.077	-.134	-.057
thematic: news	407	-.070	.232	-.188	.292	-.110
thematic: movie	604	.026	.094	.143	.078	-.204
thematic: music	85	.276	-.051	.194	.238	-.242
thematic: kids' (cartoon)	59	.131	-.098	.494	.048	-.791
other	203	-.132	.119	-.103	.417	-.304
CHANNEL MENTIONED SECOND						
public	1178	-.136	.122	-.319	.045	.052
commercial	5361	.012	-.112	.086	-.082	.079
thematic: documentary	1194	.065	.125	-.051	.115	-.144
thematic: sport	422	-.040	.027	.035	-.068	-.099
thematic: news	203	-.080	.353	-.132	.384	-.119
thematic: movie	539	-.089	.045	-.033	.000	-.059
thematic: music	90	.196	-.033	.546	-.056	.015
thematic: kids' (cartoon)	77	.139	.117	-.025	.116	-.339
other	286	-.042	.257	-.066	.352	-.238
CHANNEL MENTIONED THIRD						
public	1835	-.086	.005	-.176	-.037	.103
commercial	3172	.033	-.028	.094	-.035	-.017
thematic: documentary	1636	.009	.044	-.042	.013	-.032
thematic: sport	579	-.045	-.078	.033	-.114	.103
thematic: news	245	-.072	.145	-.136	.352	-.119
thematic: movie	741	-.068	-.023	-.029	-.005	.098
thematic: music	255	.222	-.148	.465	.071	-.033
thematic: kids' (cartoon)	156	.121	-.120	.178	-.105	-.028
other	463	-.084	-.042	-.028	.080	-.068
VÁLTOZOTT-E A TÉVÉNÉZÉSI SZOKÁS?						
watches less	4601	.049	-.057	.159	.015	.083
did not change	4093	-.053	.033	-.177	-.048	-.102
the same amount, but different channels	701	-.030	.154	-.050	.092	.123
watches more	95	.072	.146	.067	.250	-.254

Professional usage factor

Respondents have high weight in the professional usage factor typically reads quality and business newspapers. The values of the variables for other newspaper types and those for reading habits do not allow for drawing any specific conclusion.

Considering the time spent on watching TV, we cannot make a statement as unambiguous as for the other factors. Anyway, the highest value was achieved by the 'less than 1 hour' category. Our investigation, however, yielded some interesting findings regarding channel preferences. The very high figure for 'other' channels may be surprising at first glance. Yet our factor analysis showed that the members of this factor frequently visit foreign news portals. Therefore it may very well be the case that the watching of foreign television channels is also characteristic for professional users – however, the low count of elements has to be taken into account, again. Still, the popularity of news and documentary channels is pretty obvious, while sports programmes seem to be attracting very few professional users.

Inquirer factor

Sample members in the inquirer factor are very active in newspaper reading. All figures, except for that of free newspapers, were impressively high. Moreover, the appearance of broadband Internet on newspaper reading habits turned out to have had the largest impact on this factor. Which is rather interesting since elder people are typically represented with a higher weight in this factor, and they are theoretically characterised by established and stable media consumption patterns. Anyhow, the fact that the 'did not change' category received a negative value and that the figures of all other categories were above 0.2 implies that the reading habits of respondents with a high factor weight did change, indeed.

The amount of time spent watching TV is rather high in this factor. Channel preferences, however, could not really be determined. Several hours of TV per day probably allow for watching quite a number of different channels. The answers for the question on the change in TV viewing habits imply that there was some kind of change, though not as significant in extent as in the case of heavy usage factor.

Summing up the above, one may state that the various Internet usage factors are characterised by different media usage habits. Other (e.g. demographic) variables should not be ignored, either, as they have a determinative role in forming people's

media usage patterns. However, our factors can still be considered appropriate for identifying the various user groups and for describing their primary characteristics.

7.4.4 First encounters with the Internet

Regarding the spreading of the Internet, and governmental policy making, it may be useful to look at how the sample members with a high weight in a given factor first met the Internet, and which technology their first Internet subscription represented. This may help us get to know how the different groups can be reached, and how one could „persuade" consumers who do not use the Internet yet, but who may potentially belong to one of the usage types described by our factors.

Table 18: *Averages of Internet usage factors by encounter variables*

		prosumer	*innovator*	*heavy usage*	*professional usage*	*inquirer*
WHERE DID YOU FIRST MEET THE INTERNET?						
home	2018	-.009	.052	-.019	-.093	.056
school	2542	.230	.066	.201	.087	-.108
workplace	3324	-.155	.033	-.193	.008	.064
friends	1149	-.047	-.254	.074	-.072	-.047
other	730	.000	-.127	.110	.031	.005
WAS YOUR FIRST HOME ACCESS A PAY SERVICE?						
pay service	8143	-.016	-.027	-.021	-.001	.007
free	1620	.079	.137	.105	.007	-.037
WHAT WAS THE TECHNOLOGY OF YOUR FIRST HOME ACCESS?						
analogue telephone modem	4598	.112	.445	.070	.060	-.028
ISDN	305	-.103	.036	-.172	.063	-.078
broadband (cable, ADSL)	4436	-.097	-.423	-.031	-.064	.042

Considering the two factors most characteristic for young users – prosumer and heavy usage – it is obvious that their schools were the place where they got to know the web. In the case of the countryside-oriented heavy usage factor, the 'other' category (including libraries and 'telehouses') also achieved a positive value, which implies that this may be an efficient way to involve new users, as well. The other three factors cannot really be described by the way how they first encountered the Internet.

Telephone modem access is most typical for innovators, which could actually be expected considering the fact that they were the first group to begin using the Internet. Broadband technologies, and even the ISDN-technology only appeared somewhat later, thus innovators had had no alternative to modem access for quite a long time. The modem, though not as significant as for innovators, also appears as the first technology of prosumers. Free phone modem accesses are the most characteristic for the innovator and the heavy usage factors.

The inquirer factor was the only one where broadband technology achieved a positive, yet not very high score. This indicates that sample members whose first Internet subscription was a broadband one are primarily represented by this factor.

8. Main findings

The infocommunication revolution brought about basic changes in the structure of some business sectors, and started radical transformations in the widely interpreted economic and social structure. One of the most directly affected sectors is media industry, where digitalisation allowed for a supply of a never before seen amount of content and the realisation of personalisation.

A number of forecasts were prepared during the nineties on how digitalisation, the establishment of new infrastructures and the multiplication of the amount of content will affect the media industry structure. Many thought that the Internet would not cause any significant changes in the structure of media consumption – based on the fact that television did not 'kill' the radio, and that home VCRs did not mean the closure of cinemas. Other researchers, however, expected the first decade of the 21st century to bring about the death of television, with network content provision taking over the place of traditional broadcasting and distribution technologies. One does not have to be very brave to draw the conclusion that neither one of the two extreme statements holds true. The truth is, as it has always used to be, somewhere in between.

The infocom revolution and the convergence of industries (the 'fusion' of media, telecommunication and information technology) gave way to the introduction of interactive applications. The fact that this did actually happen and that the market reaction was positive is basically due to the rapid changes in consumer habits. Now, it has become apparent that the role of the passive media consumer, the *couch potato*, is not very attractive to many, they rather choose to act like *desk potatoes*, that is active users. A typical consumer, however, does not follow any of the extremes: comfortable and user-friendly applications which facilitate the expression of their preferences are attractive to many, yet there are only a few people who would really like to compile their individual media content each day themselves. This kind of limited interactivity in consumer behaviour may be referred to as *lazy interactivity*; and it very much looks as if the applications serving this type of consumer attitude are the most popular ones.

International literature has not yet established a standard definition for interactivity. Some experts consider programme choice and consumers' opportunity to choose to

represent some kind of interactivity, while others emphasise the two-way information flow and the opportunity to send inputs.

International literature more and more frequently uses the expression *enhanced television*, clearly distinguishing it from interactive television. The characteristics of enhanced television are: unidirectional flow of information; all information (e.g. textual information, pictures from various camera angles) is transmitted to the consumer, which they may recall from their hardware device (typically a set-top-box).

The essence of *interactive television* is bidirectionality: the consumer has a direct connection to the server of service provider, from which they can download the information they are interested in. This enables the provision of several television-independent services, like e-commerce and telebanking. Digital cable television even makes the Internet available, the user may surf the web or use email services without a computer (of course, the digital decoder, the set-top-box itself may be regarded as some type of computer).

As a consequence of the above, I wish to distinguish between *interactive use* and *interactive television*. Interactive use does not necessitate two-way communication, the above-mentioned local interactivity is sufficient. This category includes the case when programmes are not influenced by the individual consumer but by the audience as a whole, for example when viewers can decide by phone (SMS) votes which movie – from amongst some previously announced ones – the provider should broadcast, or when the public votes for or against a player of a reality show.

Interactive television, on the contrary, is used in the sense of *such a two-way television service in which the consumers can influence the content individually by sending various inputs*. Concerning more advanced applications, instead of television service, the term multimedia service – including the availability of texts, photographs and communication services besides the usual audio and video signals – would be more appropriate. What is more, by the expression multimedia service we could overcome the problem that one may very well consider technologies other than television platforms, for example network media.

Many people still consider computer networks and television platforms to be performing different functions, yet the range of services offered by these two

technologies is certainly becoming more and more similar. In the market of interactive services, the Internet and digital television are competing technologies. Their spreading is certainly influenced by the competition between the two infrastructures.

The renowned diffusion theory of Rogers (2003) describes the acceptance of market innovations with the help of an S-curve. According to the theory, the formation of the consumer group adopting the new service is quite slow for most innovations. When the group reaches the critical mass, however, market expansion suddenly accelerates, more and more people join the group of consumers. Yet the value of this critical mass is rather hard to determine; Goff (2002) suggested that this value should amount to 15% of all households in the case of broadband services. This is in accordance with critical mass estimates for other infocommunication devices.

According to Rogers (1986), three characteristics should be „added" to the diffusion theory when new communication technologies are considered. One of them is the significance of the critical mass: the value of any communication service is actually created by the fact that others use it, as well. In the background, there is the network effect known from microeconomics, which states that the utility of any product or service is exponentially proportional to the number of its users. In the case of interactive media services, there is a kind of indirect effect: with the number of users growing, more and more actors invest in content and infrastructure development, thus more and more services become available.

Another special feature of new media is that it is characterized by tool technologies; the most popular applications of which are shaped by consumer habits, by the re-discovering of the devices themselves. A consequence is that the predictions prepared during the development of a given technology or device may or may not be right about which application will be the most popular one. Regarding the Internet, many were surprised by the popularity of chat rooms and forums, and mobile technology experts did not generally expect the SMS service to achieve breakthrough success, either.

The third factor to be considered as related to new media is that the acceptance of the innovations and the mere fact that they are consumed is less significant than the

intensity of use. In new media studies, the dependent variable should reflect the extent of use rather than the decision about whether to use a given product or not.

According to diffusion theory, consumer groups who accept the new technology in different phases of its spreading can be distinguished rather clearly. Most relevant to our topic are innovators and early adopters, they are the ones to appear on the demand side in the early stages of market development. Innovators are receptive to anything new, they are relatively well-off and they prefer a cosmopolitan way of thinking, thus they are of key importance when launching a new technology. Early adopters are „closer" to local social communities, they are often considered opinion leaders. Later potential consumers often rely on early adopters' experiences, thus they also have a key role in the spreading of innovations.

The aim of the empirical research was to investigate the Hungarian consumers of broadband services. The technology is in an early phase of market development, that is why I focused on the characteristics of innovators and early adopters. It was found that this segment markedly differs from the average in its demographic, media consumption and ICT penetration variables.

Demographic variables demonstrated a strong over-representation of young people, males, and those with a higher education degree, a residence in the capital. This was not much of a surprise: each previous Internet study showed that young people and those with a high status are the primary users of the web.

Media consumption related variables, however, yielded less evident results. Daily newspapers were found to be very widely read, especially in the light of the fact that many consider the Internet to be one of the primary substitutes of daily newspapers. Still, we have to bear in mind that the sample consists of people with a high social and economic status, which determines their newspaper reading habits absolutely irrespective of the Internet. Interesting is, at the same time, that every third respondent reported that they had been reading less since they have had a broadband Internet subscription at home. Television-related variables indicate the popularity of thematic channels. But again, a potential explanatory variable may be the special composition of the sample and the fact that – due to the nature of our study – we only considered households with a cable television access. Half of the sample members reported that there was a fall in the amount of time they spent on watching TV since

they had had a broadband subscription. This is a very high figure especially if compared to the very small amount of Hungarian-language video content available on the web.

The ICT-penetration of households significantly exceeds the average. This is, however, not a surprise in the light of respondents' high status, their innovator (or early adopter) attitude and their receptiveness to new technologies.

The next step in the research was a factor analysis based on the Internet usage variables; the result was five well-differentiable user types. By calculating factor averages, I examined the extent to which these groups differ in their aforementioned demographic, media usage and ICT-penetration variables.

The prosumer factor describes the usage behaviour in which the interactive nature of the Internet is important, there is a kind of content providing activity. Sample members with a high factor weight in this factor are typically young, with the majority still being a student. Neither newspaper reading, nor television viewing achieved very high values. Their favourite newspaper is Metro, and music and cartoon channels are the most popular amongst them. They typically got to know the Internet at school.

The innovator factor includes those who have been using the Internet for years and who have also had a home Internet access. They typically begun with a phone modem access, which was later replaced by a broadband subscription. Sample members in this factor have a higher education degree, and they are typically owners/entrepreneurs, self-employed intellectuals or employed intellectuals. The dominance of Budapest's inhabitants and males is absolutely apparent, and there are quite a number of single households. Considering media usage habits, they primarily read quality and business newspapers, and watch public or news channels. An innovator's household usually possesses several computers, yet they do not own an extraordinarily high number of consumer electronics devices.

The heavy usage factor stands for consumers who spend a lot of time using the Internet, using a large number of applications. The factor is dominated by males, and by the youth. Besides students, there are people qualified as industrial workers, as well. The weight of the countryside is rather significant in this factor. Newspaper reading is not very typical, the only exception is tabloid newspapers. However, the

amount of time spent watching television is high. Their favourites are music and cartoon channels, while public and news channels are far less popular. The first encounter of sample members in this factor with the Internet typically took place at school.

The professional usage factor is characterised by a high amount of time spent surfing the Internet, by teleworking, listening to Internet radio stations, the visiting of foreign news portals, and the design of homepages primarily dealing with science or arts. Considering the profession of professional users, the dominance of self-employed intellectuals is obvious. The distributions of the other demographic variables are not very typical. Daily quality and business newspapers are the most popular. News and documentary channels are also favoured, yet other (primarily foreign) channels are frequently viewed, too.

The Internet usage of those in the inquirer factor is rather 'simple' as compared to the other factors: it is primarily limited to visiting Hungarian news and television portals. Females, just as well as elder people, have a rather high factor weight here. What is more, this is the only factor where pensioners and housewives achieved a positive value. Respondents in this factor read various types of newspaper (quality, regional, business, tabloid), yet their newspaper reading patterns were substantially restructured by the appearance of broadband subscriptions. They also spend a lot of time watching television, yet their channel preferences are not as clear as in the previous cases.

The group of those with a broadband Internet subscription is often regarded to be homogeneous, which may not be correct. The aim of my empirical research was to get a more exact picture of this segment. We do know that in today's Hungary, cable Internet subscriptions are available only to those with a higher income, and that the ability to use the Internet is not possessed by the wide public, either. The stereotype that they are young, highly qualified, high-status urban citizens is often associated with the entire 'Internet society', yet even more frequently with those who have a broadband subscription. It was not my intention to declare that this picture is absolutely incorrect, yet I found it important to explore some major types of usage.

Related to the research is the question whether the diffusion of broadband Internet is a suitable method for eliminating the digital divide. Telework opportunities, the

availability of a wide range of contents and services, and the bridging of large geographical distances theoretically allow the improvement of an unfavourable social status. Rogers (2001) claims that the Internet does not reduce social inequalities, but rather tends to increase them. This reasoning is primarily based on the unavailability of the Internet (lack of computers or wired connections) and the differences in demographic characteristics, in qualification and in learning abilities.

In my opinion, this line of research may be continued by analysing the relationship between the diffusion of broadband accesses and the extent of the digital divide. It may prove useful to look at whether the availability of broadband services in a smaller community *ceteris paribus* alters the intra-community position of the individual, and whether it is suitable for improving the socio-economic status of an entire community. Another interesting question is whether the ideas put down in various policy programmes – e.g. the establishment of public access points or the adjustment of content development to the needs of the wide public – indeed facilitate the diffusion of interactive services.

Another way to contribute to this field could be the longitudinal analysis of media usage habits. There are some forecasts about the impact of the Internet on the consumption of traditional media products, yet there is a lack of empirical studies on the topic. To some extent, this may be ascribed to the fact that the Internet only begun to spread intensively during the second half of the nineties, along with the expansion of entertainment and information contents. As a consequence, long-term trends could not have been determined appropriately. Now, however, the time has probably come to begin thinking about research projects on this matter.

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11. Glossary

API: *Application Programming Interface*. A concept related to digital television, which stands for the interface through which the various services appear to consumers.

CA: *Conditional Access.* A system for limiting users' access rights to certain programmes or services by defining different levels of rights. This ensures that pay services can only be accessed by those who have a subscription.

DSL: *Digital Subscriber Line.* Enables high speed data transmission.

DTT: *Digital Terrestrial Television*

DTV: *Digital Television*

DVB: *Digital Video Broadcasting.* A system of standards about the development of European digital television, established in 1993.

DVB-C: *Digital Video Broadcasting – Cable.* The cable platform of *DVB* standards.

DVB-S: *Digital Video Broadcasting – Satellite.* The satellite platform of *DVB* standards.

DVB-T: *Digital Video Broadcasting – Terrestrial.* The terrestrial platform of *DVB* standards.

EPG: *Electronic Programme Guide.* An interactive application in digital television assisting viewers in browsing the various programmes and providing information about them.

enhanced television: A service often offering the experience of *interactive television,* yet not total interactivity. Communication is unidirectional, all the information (e.g. text information, pictures from various camera angles) sent by the broadcaster is received by the consumer. However, they can selectively load the information they need using their hardware device, typically a *set-top-box*.

iTV: interactive television. A *two-way television service in which the viewer can influence the content individually by sending various inputs.*

killer application: A consumer-attracting application which guarantees the market success of a given technology.

multiplex: A concept related to digital television; the multiplex is the set of programmes transmitted in a single package through a single frequency band. The frequency band occupied by one analogue channel is equal to one multiplex, which is usually able to carry 5 to 6 digital channels.

platform: A concept basically related to multi-channel television, which is used more and more frequently ever since the appearance of digital television. Consumers may access the programmes through three different platforms (terrestrial, cable, satellite). Each one of these operates by a given business model, and subscribers need to enter into a contract in order to access the service.

prosumer: An expression acquired by 'merging' the two words producer and consumer. It refers to the situation when a user simultaneously behaves both as a producer and as a consumer (especially characteristic in the case of the Internet).

PPV: *pay-per-view*. One of the services of digital television, enabling consumers to individually purchase the programme they are interested in (particularly popular in the case of movies and sports events).

PVR: *Personal Video Recorder*. A device the enormous storage capacity of which enables consumers to record the desired programmes in order to play them back at some later time (as much as 40-60 hours can be recorded).

set-top-box: A device for converting digitally broadcasted programmes, to be connected to traditional analogue television sets. Its use allows consumers the viewing of digital channels without having to purchase a new television set.

switchover: A concept related to digital terrestrial television. It refers to the date when analogue broadcasting is terminated, thus terrestrial channels can only be received digitally later on (there has not been a country-wide switchover in Europe yet).

UMTS: *Universal Mobile Telecommunications System*. Third generation mobile communication service, which allows for a never before seen variety of applications (e.g. the transmission of video signals) thanks to its high data transfer capacity.

VOD: V*ideo-on-demand.* A service where consumers may choose from a number of movies – potentially several thousands of them – in the company's virtual library, and watch the programme they are interested in.

12. Annex

Appendix 1

Ph.D. questionnaire research amongst chello-subscribers

1. How many persons are there in your household using the Internet? ….. person(s)

2. Are you the primary user in your household (are your the one who uses the Internet the most)?

- ☐ yes
- ☐ no

3. When did you start using the Internet (which year)? …..

4. Where did you first encounter the Internet?

- ☐ home, family
- ☐ school, university
- ☐ workplace
- ☐ friends
- ☐ public institution (e.g. library)
- ☐ telehouse
- ☐ other

5. Since when do you have access to the Internet at home (which year)? …..

6. Was your first home access a pay service or a free service?

- ☐ free (e.g. Freestart, kiwwi)
- ☐ pay (subscription)

7. What was the technology of your first home access?

- ☐ analogue telephone modem
- ☐ ISDN
- ☐ broadband (cable, ADSL)

8. Why did you choose a broadband subscription? (You may check more than one box)

- ☐ price
- ☐ continuous online access
- ☐ no phone costs
- ☐ speed, capacity
- ☐ other, please specify: ……..

9. Why did you choose chello? (You may check more than one box)

- ☐ it was the only available broadband service at my place of residence
- ☐ price (cheaper than other broadband services)
- ☐ speed, capacity
- ☐ brand name
- ☐ special offer
- ☐ other, please specify: …….

10. How much time do you spend surfing the Internet in a day on average? …… hours

11. If you are not the primary user in the household: how much time does the most active user in your household spend surfing the Internet in a day on average? ..…. hours

12. How often do you visit news portals, how often do you use the Internet to gather information on current occurences?

- ☐ practically each day
- ☐ once or twice a week
- ☐ occasionally
- ☐ never

13. Which type of news portals do you visit regularly? (You may check both)

- ☐ Hungarian
- ☐ foreign

14. How often do you visit the portal of large Hungarian television channels? (MTV Online, tv2 Korridor, RTL Klub Online)

- ☐ practically each day
- ☐ once or twice a week
- ☐ occasionally
- ☐ never

15. How often do you listen to radio programmes through the Internet?

- ☐ practically each day
- ☐ once or twice a week
- ☐ occasionally
- ☐ never

16. **Do you use the Internet for telework? Do you use the Internet to communicate or exchange documents with your colleagues and partners when at home?**
    - ☐ several times a week
    - ☐ several times a month
    - ☐ occasionally, few times a year
    - ☐ never

17. **Do you have an own homepage?**
    - ☐ yes, I built it myself
    - ☐ yes, but it was built by someone else
    - ☐ no

18. **If you have a homepage, what do you use it for? (You may check more than one box)**
    - ☐ publishing personal data, photographs
    - ☐ presenting hobbies
    - ☐ publishing pieces of art (e.g. own poems, drawings, paintings)
    - ☐ publishing scientific works (e.g. publications)
    - ☐ other, please specify: ……..

19. **Have you ever paid for Internet content, e.g. music or movie download, online betting service, etc? (Only purchases of content qualify, thus ordering books or pizzas through the Internet does not belong to this category!)**
    - ☐ yes, several times
    - ☐ yes, but only once
    - ☐ no, I have never tried that

20. **Do you download such music or video files, or possibly computer games from the Internet, which can be accessed legally and free of charge?**
    - ☐ several times a week
    - ☐ several times a month
    - ☐ occasionally, few times a year
    - ☐ never

21. **How many computers are there in your household altogether? (Including laptops, notebooks, but excluding playstations, palmtops!) Attention! Please also include the devices which are owned by the employer but used by you and/or another household member!**
    ……

22. **Which one of the following consumer electronics devices do you possess? (You may check more than one box)**
    - ☐ television set
    - ☐ VCR
    - ☐ DVD-player
    - ☐ play station
    - ☐ CD-player

23. Does anyone in your family/household own a mobile phone?

- there is no mobile phone in the family
- there is (are) a mobile phone(s) in the family, but it (they) can only be used to make and receive calls and for sending and receiving SMS messages
- there is at least one mobile phone in the family which offers more advanced (WAP, MMS) services

24. How much time do you spend watching TV in a day? …. hours

25. Do you regularly (at least 3 or 4 times a week) read any of the following daily newspaper types? (You may check more than one box)

- quality newspaper (Magyar Hírlap, Magyar Nemzet, Népszabadság, Népszava)
- regional newspaper
- tabloid newspapers (Blikk, Mai Nap, Színes Mai Lap)
- business newspapers (Napi Gazdaság, Világgazdaság)
- free newspaper (Metro)

26. Which three television channels do you watch most frequently?

Channel viewed most frequently: ……..
Channel viewed second most frequently: ……..
Channel viewed third most frequently: ……..……

27. How satisfied are your with the choice of the following types of channels? Please indicate the appropriate number in each line!

1- no such channels for the time being, or too few, would like more
2- the choice is appropriate
3- too many for the time being, would like less
4- do not know

General: ….
Travel: ….
Movie: ….
Sports: ….
Music: ….
Kids': ….
News: ….
Women's: ….
Documentary: ….
Local channels: ….
Information: ….
Erotic: ….

28. Do you usually watch the news programmes of Hungarian national channels? Please indicate the appropriate number in each line.

1- I watch it intentionally
2- I watch it only because one of the family members likes it
3- I watch it only if there is no better programme
4- I do not watch it

Napkelte (M1, M2): ….
Híradó (M1, M2): ….
Híradó (RTL Klub): ….
Tények (TV2): ….
Jó estét Magyarország! (TV2): ….
Este (M1): ….

29. Have your newspaper reading habits changed since you are a chello-subscriber?

- I read more
- I read less
- I read the same amount, but not the same newspaper(s) as before
- newspaper reading habits have not changed
- I do not know

30. Have your television viewing habits changed since you are a chello-subscriber?

- I watch more TV
- I watch less TV
- I spend the same time watching TV, but not the same channels as before
- TV viewing habits did not change
- I do not know

31. How many persons are there in your household (including yourself)? ….. persons

32. If you are not the only member: How many children are there in the household born after December 31, 1984? …… persons

33. Your year of birth: …..

34. Gender:

- male
- female

35. Please indicate your place of residence!

- Budapest
- large town (county seat)
- small town
- village

36. Education:

- primary
- industrial
- secondary
- higher education degree

37. What is your profession?

- owner, entrepreneur
- self-employed intellectual
- employed intellectual
- other employee
- manual worker
- student
- retired
- housewife

Note: No data were recorded for questions 27 and 28 due to technical reasons.

Appendix 2

Frequency of the channels mentioned in the questionnaire

Channel	Mentioned first		Mentioned second		Mentioned third	
	frequency	%	frequency	%	frequency	%
3Sat	6	0.06	5	0.05	3	0.03
Animal Planet	55	0.56	75	0.77	128	1.31
ARD	0	0.00	0	0.00	1	0.01
Arte	1	0.01	0	0.00	1	0.01
BBC	11	0.11	16	0.16	37	0.38
BP Tv	3	0.03	8	0.08	17	0.17
Cartoon Network	19	0.19	24	0.25	41	0.42
CBS	0	0.00	1	0.01	0	0.00
Club	0	0.00	2	0.02	6	0.06
CNBC	2	0.02	4	0.04	2	0.02
CNN	31	0.32	21	0.21	41	0.42
Discovery	250	2.56	302	3.09	348	3.56
DSF	1	0.01	0	0.00	1	0.01
Duna TV	141	1.44	268	2.74	277	2.83
Other foreign	6	0.06	5	0.05	7	0.07
Euronews	1	0.01	10	0.10	5	0.05
Europa Europa	4	0.04	10	0.10	11	0.11
Eurosport	58	0.59	104	1.06	158	1.62
Extreme Sports	7	0.07	15	0.15	20	0.20
Fashion TV	2	0.02	2	0.02	8	0.08
Filmmúzeum	10	0.10	25	0.26	56	0.57
Fix TV	6	0.06	8	0.08	19	0.19
Fox Kids	8	0.08	9	0.09	25	0.26
Fox News	0	0.00	0	0.00	1	0.01
Hallmark	64	0.65	94	0.96	193	1.98
Hálózat TV	0	0.00	3	0.03	10	0.10
HBO	525	5.37	410	4.20	481	4.92
helyi tv	2	0.02	4	0.04	23	0.24
Hír TV	362	3.70	150	1.54	158	1.62
Humor1	23	0.24	35	0.36	77	0.79
M2	29	0.30	106	1.08	115	1.18
Magyar ATV	73	0.75	84	0.86	92	0.94
Mezzo	13	0.13	35	0.36	29	0.30
Minimax	11	0.11	16	0.16	49	0.50
MTV	25	0.26	21	0.21	37	0.38
MTV1	943	9.65	804	8.23	1443	14.77
National Geographic	152	1.56	277	2.83	327	3.35
NBC	0	0.00	1	0.01	1	0.01
Nickelodeon	21	0.21	28	0.29	41	0.42
ORF	1	0.01	5	0.05	11	0.11
PAX	1	0.01	3	0.03	4	0.04
Private Gold	8	0.08	10	0.10	33	0.34

PRO7	22	0.23	16	0.16	21	0.21
Rai Uno	3	0.03	2	0.02	8	0.08
Reality TV	7	0.07	21	0.21	50	0.51
Romantica	3	0.03	4	0.04	8	0.08
RTL	5	0.05	9	0.09	5	0.05
RTL Klub	3867	39.58	1823	18.66	932	9.54
RTR Planet	3	0.03	4	0.04	1	0.01
Sat1	1	0.01	8	0.08	4	0.04
Sky	1	0.01	2	0.02	1	0.01
Spektrum	383	3.92	514	5.26	781	7.99
SPORT1	438	4.48	303	3.10	400	4.09
TCM	1	0.01	0	0.00	0	0.00
Travel	23	0.24	26	0.27	52	0.53
tv2	1355	13.87	3082	31.54	1351	13.83
TV5	6	0.06	3	0.03	9	0.09
TVE	3	0.03	0	0.00	4	0.04
VH1	17	0.17	22	0.23	41	0.42
Viasat3	439	4.49	456	4.67	889	9.10
VIVA	43	0.44	47	0.48	177	1.81
VOX	4	0.04	8	0.08	11	0.11

Appendix 3

Television channels by channel type

a.) Public channels
- Duna TV
- MTV1
- M2

b.) Commercial channels (general entertainment)
- RTL Klub
- tv2
- Viasat3

c.) Documentary channels
- Animal Planet
- Discovery
- National Geographic
- Spektrum
- Travel

d.) Movie channels
- Europa Europa
- Filmmúzeum
- Hallmark
- HBO
- TCM

e.) Sports channels
- DSF
- Eurosport
- Extreme Sports
- Sport1

f.) News channels
- BBC
- CNBC
- CNN
- Euronews
- Hír TV
- NBC
- Sky

g.) Music channels
- MTV
- VH1
- Viva TV

h.) Kids' channels
- Cartoon Network
- Fox Kids
- Minimax
- Nickelodeon