

Development of the Hungarian information society in the last decade

HUNGARIAN COUNTRY REPORT 1998-2008

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Authors: Róbert Pintér (BME-ITTK), Mihály Csótó (BME -ITTK), Márton Holczer (BME -ITTK), Gergely Kis (GKleNET), Szilárd Molnár (BME -ITTK), Árpád Rab (BME -ITTK), Levente Székely (BME -ITTK).

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Introduction: a decade of building institutions and infrastructure

Ten years is not regarded as a long time in history but **the past decade played an outstanding role in regard to the development of information society**. It is true especially in Hungary, where fundamental changes took place during this time. Just by looking at the statistical figures on computer and Internet usage it can be clearly seen that the aforementioned **changes** have directly affected almost half of the country's population but have also had an **impact upon society at large**.

This country report focuses on those **turning points** that most directly determined the direction of change and discusses those **areas and organisations** that have left the most visible mark on the last decade. Thus, the report highlights some important events and also introduces the most important related areas.

In the last ten years Hungarian information society was determined by the monopoly and subsequent liberalisation on the domestic telecommunications market. Competition on the mobile communications sector also intensified at the turn of the millennium, when the Hungarian market had three players for the first time. In addition, for the first time, in the middle of 2001, the number of mobile subscribers exceeded that of landline subscribers. Penetration at this time was registered at 37-38 percent. Furthermore, in 2007 mobile Internet was an affordable alternative to ADSL and cable Internet in the bigger towns. This trend is expected to lead to intensified competition across the whole country.

The last decade also saw a development in the institutional background of information society research in Hungary. Research centres where basic research of a European standard can be conducted were established. The development of IS institutions were significantly facilitated by non-governmental organisations and civil organisations, which accomplished a lot despite their low numbers. After the government withdrew from the front line in 2007 the development of information society in Hungary reached a point where civil organisations were granted greater powers than ever before in setting objectives and in strategic planning.

Thus, this thematic report will give an overview of the past ten years the key areas in which there was a process of building the information society in general as well as the building of infrastructure and the development of institutions in particular.

Telecommunications infrastructure for the population: figures and trends

In the last decade **infocommunication technologies (ICT) were widespread in Hungarian society** and had a fundamental impact on it. **Mobile phones had the biggest breakthrough** and in 2007 their penetration exceeded the mind-blowing figure of 100 percent. Even though not every member of society has a mobile phone¹, the proliferation of this ICT tool can be regarded as the biggest success story of the last ten years.

By today's standards it seems anachronistic that there was a time when people had to wait 6-8 years for a telephone line. Moreover, before the change of the political system in Hungary the issue of whether being on a waiting list for a telephone line could be inherited was a seriously debated one. **Landline telephones were the hit infrastructure of the '90s** but now there are many who only need a line to have access to the Internet. However, with "no-phone-line" ADSL landlines are becoming a thing of the past.

However, a telephone (or cable) is not enough to use the Internet: computers, subscriptions, digital literacy and suitable contents² are also needed. **The proliferation of the Internet cannot be regarded as much of a success story** as landlines were after the change of the system and mobile phones have been from the second half of the nineties.

The next part **deals with the use of the above-mentioned tools – computers, the Internet, landlines and mobile communications – by the population** and introduces the important figures, statistics, milestones and trends.³

I. The proliferation of computers and the Internet: before a breakthrough?

From slow development to getting into homes and becoming used by the majority

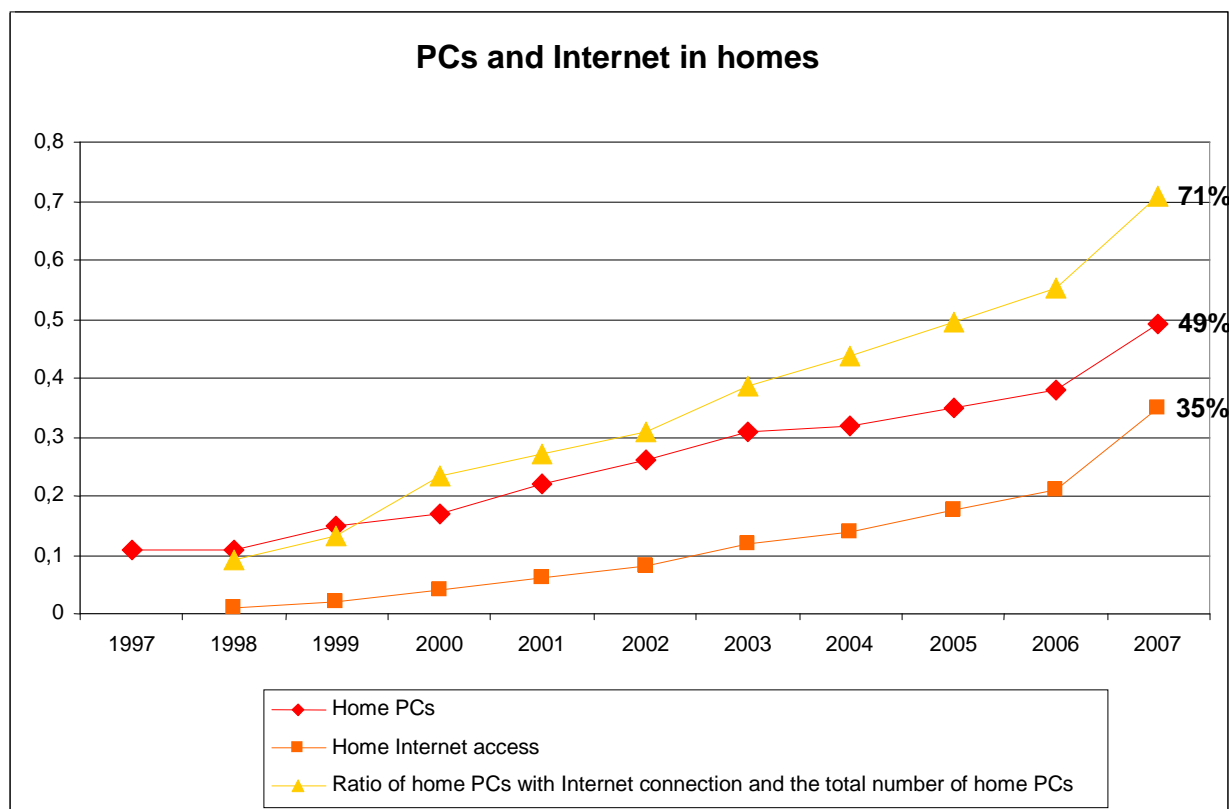
The last few years have seen a significant increase in home computer- and Internet penetration. According to WIP data, there is a computer in almost half (49 percent) of Hungarian households now, and Internet connection in slightly more than one third (35 percent). The overwhelming majority (71 percent) of homes with a computer have Internet access.

¹ Some users have two or more mobile phones in use so the real penetration is at around 80 percent, which means that there is always a significant majority for whom mobile phones are out of reach.

² The latter issue is discussed in more detail in a later chapter.

³ Most of the data in the chapter are taken from the World Internet Project (WIP) although other sources are also used (for example, data from the quarterly current awareness publications of the Hungarian Central Statistical Office). WIP is an extensive international research programme which was launched in the United States in 1999 for the study of the social impact of the Internet. Hungary joined the WIP project in 2001.

1st Figure. PCs and Internet in households



Source: TÁRKI household surveys; WIP

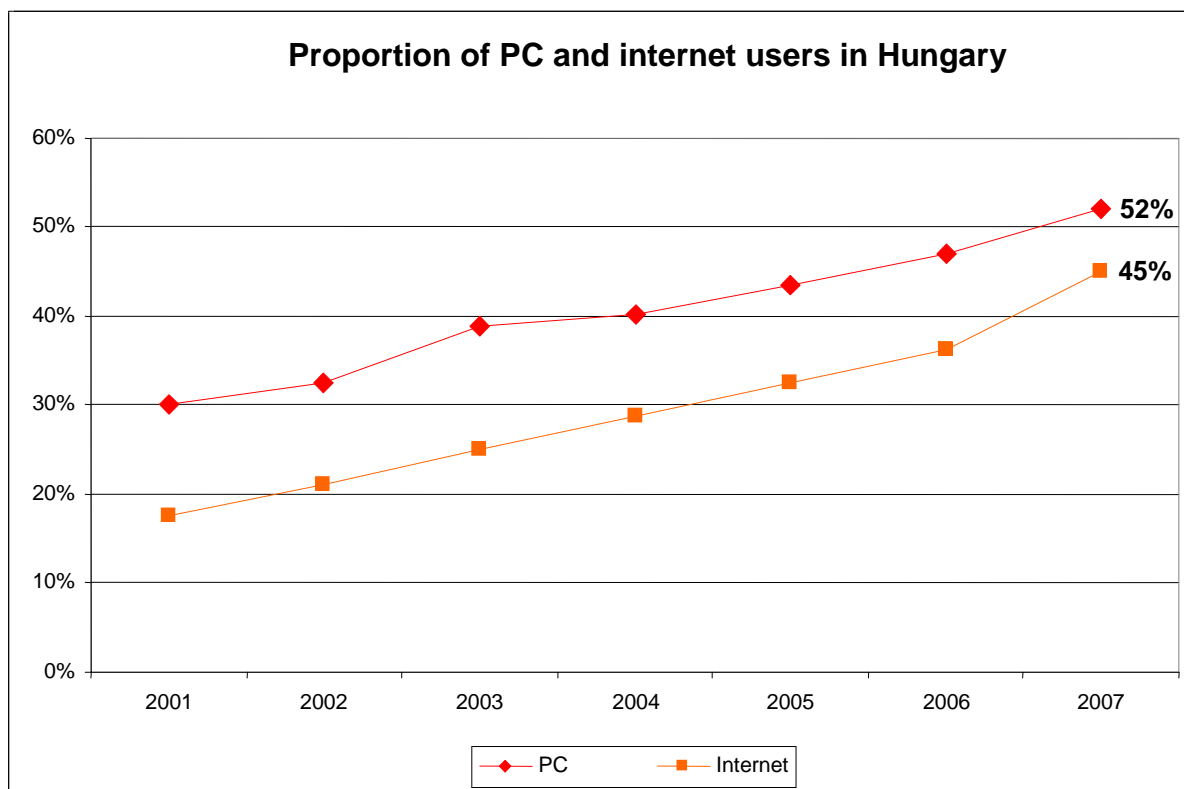
In the last ten years computers and the Internet have found their way into homes gradually, so there were no leap years. The following figure clearly shows that the growth was more or less linear in the period under review, up to the last survey, which was conducted in 2007. Now that the Internet conquered households with PCs (2002-2006) **there is a good chance for a faster expansion to begin** – the 2007 figures seem to suggest this positive development.

All computers to be hooked to the Internet!

The period generally reviewed by this report begins in 1997-98 and lasts up to the present day. However, **statistical data about Internet use in Hungary are only available from the turn of the millennium.** Surveys were conducted prior to that but there are no representative data about the whole of society.⁴

⁴ It must be remembered that Internet penetration was only 18 percent in 2001 and prior to that, in 1997-98, it was presumably between 1-10 percent; therefore, it was not worth researching the phenomenon by conducting countrywide representative surveys.

2nd Figure: Proportion of Internet users in society



Source: WIP

According to the very first survey of the WIP research, **30 percent (close to one third) of the above-14 age group used PCs and 18 percent (over one sixth) used the Internet regularly in 2001.** The most recent data, from 2007, show that in the same age group **over half (52 percent) are regular or occasional PC users and 45 percent are Internet users.** The figure above clearly shows that **Internet usage appears increasingly frequently together with computer usage.**

Internet usage saw not only an increase but **also underwent some changes.** Although the most popular ones are still those Internet uses that existed at the emergence of this ICT, some **new activities are also thriving.** The Internet is used by most people for e-mailing (92 percent), searching for information (88 percent) but with the spreading of broadband Internet phoning (28 percent) as well as reading (25 percent) and writing (8 percent) blogs are on the increase.

Non-use of the Internet: lack of interest rather than material restrictions

Based on the opinions of those who **do not use** the Internet they can be classified into two large groups: one of the groups is composed of those who do not use the Internet due to **financial considerations**, i.e. they cannot afford to do so because of the high costs. The other group is composed of those who do not use the Internet because of **cognitive reasons**, i.e. they do not need it, they are not interested in it, they cannot use it, etc.

Among those who do not use the Internet the proportion of **those who refrain for financial reasons has steadily been decreasing** since the first WIP measurement, i.e. **since 2001**, and along with this **the proportion of those who refrain because of a lack of interest has been steadily rising.** This gives rise to the question as to whether the limit of the increase in use has been reached since **further price decreases most probably could not influence cognitive inhibition.** That part of society that currently refrains from using

the Internet can to the most part be persuaded to become users if their **lack of interest and apathy are overcome**.

2. Ambiguous situation

All in all, the **situation is ambiguous** in regard to ICT penetration among the Hungarian population and their computer and Internet usage. **Mobile phone penetration is almost complete** but **landlines are on the decline**; **the era of dial-up Internet is over** and **an increasing number of home PCs are connected to the Internet**. However, there is another side to this story: **in 2007 digital culture is almost accessible to the majority of society** but the **necessary infrastructure is not available for all the households**. What can be expected then is that **the coming years will bring radical changes again**. However, despite the dynamic change that is taking place, **by international comparison Hungary continues to be among those afraid of lagging behind**.

Information society policy: bad traditions

In most countries the development of information society is co-ordinated and governed by policies. Out of the state, the researchers, the economic actors and society, the state has a key role in regard to development issues, even though they do not have an exclusive right to do so. It is possible to develop information society without policies drawn up by the state and even going against these policies; however, **it is far more efficient to co-operate along a harmonised, shared vision of the future built on consensus and enhancing each other's actions**. Since there are numerous tasks ahead but the resources are scarce, the IS policies of most states are set out in strategies and made publicly accessible to foster social cooperation and cohesion.

This chapter will provide an overview of the Hungarian state's information society policy, and its strategic initiatives in particular, from the 1990s.⁵ The peculiarly Hungarian state of affairs shares many similarities with that in other Central Eastern European countries, such as delayed actions, aping Western European models, lack of systematic planning, inefficient institutional structure and misinterpreted information policies. What makes Hungary "special" in the region is that – thanks to its political culture – it is trapped in a perpetual state of deficit, which makes it a **country of sabotaged strategies** and lost opportunities and one that is **permanently lagging behind** after a decade has passed.

1. 1994-2000: information society pushed into second line

The hegemony of **information society** and information policy that was at the core of political objectives worldwide **in the 1990s seems to have left Hungary unimpressed**. After the change of the socialist regime eleven years had to pass by before the first comprehensive information society strategic initiative, called the Széchenyi Plan, was drawn up at the beginning of 2001 and was actually implemented, albeit not entirely. **Documents and white papers previously drawn up in the field at a politically high level were abandoned** due to lack of support. **Between 1994 and 2000 the cause of information society was completely pushed into second line** in overall political programmes and planning. Even the numerous government and non-government documents were virtually unable to change this.

2. 2000-2002: information society in the ascendancy

Hungary launched its very first information society strategy, called National Information Society Strategy (NITS), as late as May 2001.⁶ It was a year before this, in the spring of 2000, when "it dawned on the government" that they were seriously lagging behind in regard to information society development. The Informatics Government Committee (IKB) was established in the early summer of 2000 as part of the Prime Minister's Office with the aim of working out and implementing the information policy guidelines. It was around this time, in the first half of 2000, that the European Commission drew up *eEurope* initiative, which set out as one its key priorities the implementation of changes in all areas towards information society. Regardless of this pressure from the EU, it was high time Hungary responded to the challenge in regard to information society development.

⁵ Statements from Pintér (2004: 84-105) and the Blue Paper (2007: 12-15) are included in the chapter.

⁶ The first modern information society strategy was drawn up in 1992 in Singapore; the European Union prepared a similar document in 1994, and Finland for example in 1995. The 1990s were the decade of drawing up strategies worldwide.

The first political strategy document that addressed the issue of information society and enjoyed political as well as economic backing was not NITS but the ***Széchenyi Plan (SzT)***, officially launched on 1st January 2001. The Széchenyi Plan was the official national development plan of the then incumbent Hungarian government built fully around the demands of knowledge economy and the expansion of an economy built on information. The most important difference between SzT and NITS is that while the chapter on information society in the former only mentions a narrowly defined ad hoc set of projects that seemed important to be highlighted at the time, the latter laid down an overall concept of building the information society.

The three main areas of development set out in NITS were **people, tools and content**, and the strategy therein was also an action plan: it allocated possible solutions and deadlines to each particular task. The **implementation of NITS covered the following themes: regulatory infrastructure, economy, culture, education, society, eGovernment and intelligent region, and electronic government.**

3. 2002-2006: the era of the Ministry of Informatics and Communications

After the **change of government** in 2002, a period of disquiet began in the Hungarian Socialist Party (MSZP) and the liberal Alliance of Free Democrats (SZDSZ) in regard to **what direction information policy should take** and who should direct it. An important issue arose, namely **what should be done with the Informatics Government Committee, the relevant chapter of the Széchenyi Plan, and the existing strategy?**

In the **summer of 2002 the government set up the Ministry of Informatics and Communications (IHM)** as the legal successor of the Informatics Government Committee, and simultaneously **set up the Office of Government Information Technology and Civil Relations (KITKH, from 2004: Electronic Government Centre)**. The former was placed in charge of information society building in general, and the latter ran the eGovernment development projects in particular.

It was stated by the leaders of IHM⁷ that the key objective of the ministry was to bridge the **gap that existed between Hungarian society and other societies, which included *not only* the developed but some developing countries**. To this effect, in 2002 IHM set the objective of bringing Hungary up to the lower-middle range of EU countries in regard to its level of information society development. In order to meet this objective they highlighted the areas of **information skills, access and content**.

In its first period of operation IHM was struggling with the **typical problems of a newly established organisation**. In order to underline the significance of information society, IHM **set up a separate strategic department** entrusted with the drawing up of a new strategy at the turn of 2002 and 2003. This strategy, planned for 10-15 years, was **adopted by the government in October 2003**, while the 2-3-year programmes were launched at the end of March 2004. The Hungarian Information Society Strategy (MITS) model **defined updating processes and modernising services as the two pillars of IS developments**. The former referred to the modernisation of the internal operation of processes in general (*back office*), while the latter to the improvement of the functions that make these same processes accessible (*front office*) for the widest possible public.

In implementing its strategy IHM envisioned co-operation with the relevant ministries and other organisations. The objectives and programmes of MITS **harmonised with the European Commission's eEurope**

⁷ Minister of informatics and communications Kálmán Kovács, political state secretary György Csepeli, and deputy state secretary Attila Suhajda were guests at the Professional Club organised by the Information Society Research Institute in June 2002, and what was said there served as the basis of reconstructing the objectives initially set by the leaders of the Ministry of Informatics and Communications.

strategy of that time, which provided an opportunity for Hungary to join EU programmes in support of eEurope (e.g. IST, eContent, eSafety, IDA, etc.).

4. From 2006 to the present day: withdrawal

It was to be expected even prior to the general election of 2006 that **the information portfolio would become part of the Ministry of Economy and Transport**. However, what consequences this would have on the political treatment of the area was not known. The two years that have passed since then shows that **no strategic progress has been made on the part of high politics in the area of informatics and information society in Hungary**. The government continues to **regard the matter of information society** as a sectoral – **mainly as an infrastructural – issue** and not as an overall modernising framework with information technology at its centre. In contrast to this, the European Union has, for more than ten years, regarded the concept of an information society as a modernisation programme, equal in importance to that of sustainable development. In Hungary, **the message conveyed by the closing down of the ministry was that the issue is even less important than before**, when the field had a ministry of its own (and the Ministry of Informatics and Communications was not even considered as an important portfolio).

The instruments for implementing tasks are limited: **the state first and foremost regulates, then it modernises itself**. Furthermore, the state is a **partner in strategic co-thinking**, it can create motivation and interest where it sees an opportunity for this among citizens (e.g. anyone who sends in their tax return electronically should get tax advantages), finally, it **improves the quality of life** (by introducing electronic services, for example, or by creating the necessary conditions for digital television, etc.).

According to the Ministry of Economy and Transport, **instead of using the old strategies and creating new ones, a strategic way of thinking is needed**. The ministry also maintains that **there is no need for the Hungarian Strategy for an Information Society**, and a White Book, prepared in partnership co-operation, could define what the actual objectives, tasks and instruments should be. Therefore, unlike its predecessors, the Ministry of Economy and Transport did not prepare a new strategy for an information society, as it is of the opinion that there is no need for one in Hungary today, since it is not for the state to point out the direction in which to proceed, but rather for the profession; therefore, there is a need to think together and to point out new aims.

All in all, it seems that **the government that came to office in 2006 does not have a policy or strategy for an information society**. However, during this period, no government initiatives concerning an information society could be heard which were markedly different from those of earlier periods⁸. Basically, **minor and major projects inherited from the Ministry of Informatics and Communications are being continued**, as indicated by the government programme. Thus, **in the past year and a half an actual gradual political devaluation of this area could be observed**.

⁸ The Netrekész (Ready-for-the-Net) programme, which was the product of half a decade of “excruciating” work aimed at popularising the information society, will not be evaluated in the scope of this report, since applicants had to submit their tenders at the time this publication was being written. However, the scandal and lobby war that surrounded the announcement of the tender clearly show that the relationship between the ministry and a considerable part of the profession has gone sour and many are dissatisfied with the work of the Ministry of Economy and Transport.

5. Evaluating information policy: bad traditions and the lack of an overall information strategy

The governments of the past decade can be held accountable for many things in regard to the development of an information society; for example, for the lack of originality, i.e. programmes specifically built on Hungarian characteristics. In the meantime, they continued the bad “traditions” that dominate information policy, namely:

- long years of turning out documents- and strategies,
- parroting old ideas and the lack of originality in setting objectives,
- lack of harmonisation in the everyday running of affairs,
- lack of consensus that would unite the political spectrum,
- institutionalisation of conflicts between and within organisations,
- low priority of the area,
- and the permanent lack of funds in operating projects.

It is important to emphasise that the main characteristics of the development and improvement of the Hungarian information society, namely the habit of turning out strategies and the lack of consensus, can be traced back to political and social reasons that maintain **this situation**. These reasons include a political culture laden with conflicts and the low level of trust just as much as the overall state of mental hygiene in Hungarian society (Csepeli, 2004). **The contradictions that exist in the development of a Hungarian information society clearly indicate the problems of Hungary’s governance lacking a feasible *vision for the future* to integrate the whole of society; thus, the issue cannot be separated from the peculiar path of the country’s development.**

The implementation of developments is further exacerbated by the **organisational problem** created in the government structure by **the treatment of the issue of information society**. In essence, politics and governance worldwide operates according to a *vertical* logic, in a sectoral structure run by ministries; therefore, it is unable to effectively deal with issues of a *horizontal* nature, like the challenges of information society development.

All things considered, although important steps have been taken in information policy in the last ten years, the area is blighted by ***time wasted*** and opportunities missed, forcing it into a ***constant secondary and ignored state***. As long as the government treats information society in a simplified way, as a primarily sectoral issue, and as long as the much desired breakthrough is impossible to be realised due to the limited budget allocated for informatization, only one or two relatively large-scale investments can be sponsored, which is not even enough for Hungary to maintain its current position by international comparison.

As for now, the **huge gap between the European Union and Hungary** in regard to the information society **not only manifests itself in Internet usage indicators but also in people’s attitudes**: the extent to which they consider the area their priority and how they handle it. Hungary has a lot of catching up to do if it wishes to bridge the gap between itself and those EU member states that approach the issue in a more circumspect way, as well as the eminent new EU entrants.

Three e-administration eras

I. The informatization of administration

In 2001 the European Commission made public⁹ its first eEurope programme, which specified the twenty services – for citizens and businesses – and the assessment method with which the progress of the member states' e-administration developments would be monitored. In 2000 the Hungarian government joined the European programmes aimed at the implementation of the information society, thereby meeting the objective set out by the programme (eEurope+) aimed at the inclusion of candidate member states. In 2003 the Hungarian Information Society Strategy (MITS), forming the official basis of the European information society inclusion process, and within that the “Strategy and Action Plan 2005” for eGovernance and development of eAdministration were drawn up.¹⁰ The latter set out among its objectives online availability of 20 public services suggested by the EU (EU 20) for citizens and business.

An interesting aspect of the process of informatizing administration in Hungary is that while in the more developed countries the achievements of the digital revolution were mainly exploited by the leading sectors (service and commerce), in Hungary these achievements were utilised primarily in public administration. In 2003-2004 the overwhelming majority of institutions of public administration were equipped with computers, fax machines and mobile phones, and over 80 percent of the staff used PCs for their work. Furthermore, the overwhelming majority of these institutions had Internet access and two thirds also had intranet.

These impressive figures were not at all matched by the indicators of the use of e-administration services by the population in the same period. This can be explained by the fact that in the initial period of informatizing administration there were hardly any front office e-services available, and the number of Internet users in Hungary at that time was alarmingly low. According to the 2003 data of TNS Hungary Government Online, a mere 15 percent of those over 15 years of age used the Internet, and only 6 percent used e-administration services. (With these percentages Hungary was among the last in the 32 countries surveyed.) Today e-government services are typically used by middle-aged and older users living in smaller settlements, in contrast to the initial period of e-administration, when the main users of these services were young adults under 35 years old, living in large towns.

2. Building the basic e-administration infrastructure

The long period of informatizing administration ended around 2003, which – as we see it – was followed by the **period** lasting until 2006, **aimed at building the basic infrastructure for e-administration**. This period saw a number of significant advancements and important developments; thus, the technical, technological, infrastructural, procedural, standardisational and legal foundations were laid down for the introduction of e-administration to the wider public.

⁹ See “eEurope 2002” (COM/2001/0140 final), 13.03.2001.

¹⁰ See Government Decree 1126/2003. (XII. 12.) on the Hungarian Information Society Strategy and its implementation.

EU member states were heavily criticised between 2003 and 2005 for failing to fully meet the objectives set out in eEurope2005. However, despite the short time and the very scarce funds that were available for satisfying the requirements, Hungary managed to deliver a good performance, especially in areas such as laying down the foundations of the infrastructure and the utilities necessary for the construction and operation of e-government, as well as in joining the e-administration systems of the EU and drawing up the necessary legislation and decrees.

According to data provided by Capgemini – the company that has been measuring the readiness level of the basic 20 e-administration services in the European Union since 2000 – Hungary experienced the greatest degree of development in the past year, moving up from 23 to 14 in the European ranking. In 2003 the readiness level of electronic services was 15 percent, which jumped to 80 percent by 2006, with the percentage of online services made fully available online having reached 50 percent; thus, Hungary reached the EU average in both indicators.

All this is thanks to the implementation of the **“Strategy and Action Plan 2005”**, adopted in 2003, which basically set as its main objectives the digitalisation of the twenty fundamental public services and the construction of an infrastructure and e-government utilities to ensure reliable operation. A weakness in regard to the area of e-administration is that no real progress has been made to improve the quality of online public services and to create a more transparent, efficient, cost-effective and client-oriented state, which – as we see it – is a result of the public administration procedures not having been reformed and rationalised.

Most developed countries have a clearly identifiable flagship project or development in e-administration. One of the most important projects of the Hungarian e-government is the introduction of the **electronic tax- and contributions declaration**. After long years of preparation, development and testing, the process reached a crucial phase in 2006 since by the end of this year every Hungarian employer had to register themselves in the system, and since January 31st 2007 it has been obligatory for them to use the electronic system through the Client Gate.

According to estimates made by experts, a company can save as much as HUF 10-50 thousand by submitting their declarations electronically as opposed to on paper, while it can save HUF 300-400 million for the treasury.¹¹

Local e-governments have definitely been the most neglected area of e-administration in recent years. According to the data of GKIE.NET’s 2004 survey, the biggest problem faced by most local governments is still the acquisition or maintenance of basic infrastructure (computers of an acceptable standard) in addition to the lack of acceptable Internet connections. The years 2006-2007 saw considerable progress in this regard too, since in 2006 – also according to a survey conducted by GKIE.NET research company¹² – the proportion of PCs in Hungarian local governments was 96 percent, i.e. almost every single one had at least one computer.

The digital literacy of those working in public administration forms a vital part of the basic infrastructure of e-administration. A total of 430 people participated in the IT training courses that were funded from the central budget in 2007, which is a surprisingly low number. Fortunately, a far more favourable picture can be seen in the case of local governments. In local governments where PCs are used, there are 40.5 thousand employees (non-IT staff), out of whom 8 thousand received informatics training in 2006. Moreover, a growing number of staff employed at local governments has the ECDL exam.

¹¹ One € is app. 250 Hungarian Forints (HUF).

¹² For more detail see: Vilmos Lőrincz - Attila Tóth (2006): Use of ICT and Electronic Services at Local Governments. GKIE.NET Ltd.

In summary, the period that lasted up to 2006 saw not only the construction of the basic infrastructure of e-administration but also an increase in the demands of citizens and businesses for a service-oriented, quality administration. However, **the role fulfilled by the state remains unclear and the question of performance measurement and assessment is still unsolved. There were overlaps in back-office processes and in the operation of organisations in general, and the state budget is struggling with a significant deficit. These are only a few of those pressing problems that urgently call for a much-needed public administration reform in Hungary.**

3. Socialization of e-administration

Starting in 2007, the most recent period of e-administration, which can be called the socialization of e-administration, introduced entirely new challenges into the area. Priorities include client-oriented, sophisticated e-services that can be tailored to personal needs, the facilitation of efficiency and effectiveness to promote a competitive society and economy, the exploitation of opportunities inherent in web 2.0 applications, and the modernization of back-office processes in order to help implement all of these. From 2007 a move in the direction of providing quality services must be urged since Hungary is lagging behind in the European ranking the most in this area. The greatest challenge for e-administration is the introduction of the 5th level of online sophistication, since only one out of the nine online public services at this level reached the required personalised readiness level.

The creation of personalised, client-oriented services definitely requires the modernisation of back-office processes, which the development of Hungarian e-administration primarily depends on. Hungary is lagging behind the EU average in regard to user-oriented services despite the fact that the usability indicator of the Hungarian government portal is higher than the European average for similar indicators.

Even though it has been long known that **the development of e-administration cannot be successful without a definite and clear political purpose** and a declaration of the will to act, **this is exactly the area where Hungary has the greatest deficiency. Data reveal that despite the low Internet penetration indicators, a more extensively used e-administration could well be the driving industry** to promote a more widespread use of ICTs and perhaps even encourage today's large camp of non-users to invest into using these tools. While the Internet users are still typically the young, coming from more well-to-do backgrounds and resident in urban areas, those who use e-administration tend to be middle-aged and older and many of them come from smaller towns and villages.

1st Table: Percentage of users of online public services in 2006 in the EU-25 countries and Hungary

| | EU-25 | Hungary | |
|--|-----------|-----------|--|
| | All users | All users | Those living in households with broadband access |
| Contacted some kind of organisation of public administration via the Internet in the last 3 months | 24 | 17 | n.a |
| Searches for information | 20.5 | 13.6 | 36.7 |
| Downloads forms | 13.0 | 11.4 | 29.5 |
| Sends filled-in forms | 8.1 | 5.3 | 14.2 |

Source: Eurostat, 2007

4. Summary

In our analysis the development of e-administration was divided into three periods. The first one, **the decades of informatizing administration, was followed by the period of laying down the foundations of e-administration.** Now that we have gone beyond both these periods, **Hungary has stepped into the third stage, that of the socialization of e-administration.**

The setting up of legal and other institutional systems in Hungary supporting an operative market economy began after the change of regime and has now been completed. At the same time the official procedures and services in public administration are generally too slow, not efficient enough and it is often the case that the level of these services do not meet the expectations of the economy and society. In the meantime, the amount of administration is continuously increasing and clients have to devote more resources to accomplish their administrative tasks than they regard as acceptable. The population and businesses find administration expensive and complicated, and the majority of citizens mainly expect the development of public administration to save them time, bring more flexibility, faster services as well as more extensive and better provision of information.

Hungary began to lay down the foundations of e-administration relatively late but managed to make up for it relatively fast by joining eEurope programmes. After a rather poor rate of development, significant progress and important developments were implemented in the period between 2003 and 2006: the most important technical, technological, infrastructural, procedural, standardisational and legal foundations were laid down for the introduction of e-administration to a wider public, which provided a sound basis for the major front- and back office developments, applications and services to be launched. Unfortunately, in this phase e-administration only meant the electronisation of administration; effective co-ordination controlled by a strong hand was lacking in regard to the development projects of local governments. The informatization of administration and the laying down of the foundations of e-administration were predominantly implemented as part of informatics development projects; which highlights yet another fault of the last period, namely that technical considerations were paid attention to but expected economic and social outcomes were not.

Therefore, the new developments in the latest period of e-administration development in Hungary should not only focus on informatization, but also on client-oriented, easy-to-use services available to all and on the creation of an inclusive e-administration. The development of e-administration has become **a professional area that enjoys high priority status in politics and requires complex solutions.** Emphasis in this development should no longer be placed on informatics and technical solutions but on **the maximization of the long-term economic and social impacts of these tools.**

Economy and e-commerce

1. ICT investment does not equal competitive advantage but is the basis of competitiveness

From the mid-nineties up-to-date IT equipment and software became accessible for Hungarian households as well as for companies that saw an opportunity in modernisation. Due to the speedy development of technology, **being up-to-date by itself did not bring any competitive advantage for a company's efficient and successful operation**¹³. **Modernisation was only the prerequisite for competitiveness.** The low operating cost of IT equipment, exploiting their maximum capacity and extending the time of their competitive operation became far more important issues.

The period after 2001 was marked by a decrease in ICT expenditure all over Europe. The bursting of the dot-com bubble quenched the worldwide euphoria in regard to investing into information technology and the former enthusiasm was replaced in companies by a more careful and rational attitude to investment. For countries that joined the infocommunication revolution later, the delay also meant skipping a "stage" and in many cases **Hungarian businesses and households saved the costs related to the first phase of equipment investments that typically require a complete replacement every two to three years** (Nemeslaki et al., 2004).

2. Investment

ICT investment: lagging behind

According to the OECD Information Technology Outlook 2006 survey, Hungary occupies the 25th place among the 26 countries examined in regard to the extent of ICT investment. In 2005 Hungary as a national economy spent a total of USD 6.4 billion on hardware, software, IT services and telecommunication; both the Czech Republic and Portugal overtook Hungary in the ranking (the only country Hungary managed to overtake among the OECD member states was Slovakia). The OECD publication also point out that in a 6-year comparison (2000-2005) the growth dynamics for ICT investment in Hungary was at around 13 percent, while it was 16.5 percent e.g. in Czechia, which started from roughly the same base.

It would be wrong to blame the Hungarian state and the population for the relatively negative mood for IT investment, since **companies spent just as little on introducing ICTs.** The problem can be felt in other areas: concerning R+D spending the state continues to be the number one spender and companies spend very little on the implementation of innovative ideas and on research.

Europe falling behind

Unfortunately, **all of Europe is gradually falling behind the United States and the countries of South East Asia in regard to exploiting ICTs.** Most of the new innovative solutions in the sector are launched

¹³ The necessary equipment investment was made possible by the increasing volume of capital and/or the favourable credits.

outside Europe. Furthermore, **the business sector takes care of the support and financing of new ideas as well as their introduction to the market both in the United States and in South East Asia**, thus the companies in these parts of the world can become and continue to be market leaders with a much smaller intervention by the state.

Companies and labour: Budapest in the centre

In Hungary 618 Euros were spent on information and communication technologies per head in 2006 (this figure was 680 Euros in 2005), which represents one third of that in Austria and Finland. Regarding this indicator **Hungary continues to be lagging behind countries that had joined the EU prior to 2004 but continues to be ranked higher than those countries that joined in 2004 (except the Czechs and the Estonians)**. Despite their low incomes Hungarians spend almost the same amount on ICT as the Portuguese, even though it does not mean that Hungary is going to join the top of the rank in the near future.

In contrast to the population of South East Asia and the United States, **Hungarians, who are less open to new technologies, were/are slower to exploit the opportunities offered by technological development**. Most Hungarians are still satisfied just to use the opportunities offered by mobile phones, and they do not exploit this technology to the full.

Compared with the 2004 data in OECD Outlook, in 2005-2006 **the ratio of software engineers employed in Hungary has improved**: while in the past 7 out of 10 software engineers worked abroad, this number is now only 4 (although it must be admitted that there was a lower number of them to start with). Therefore, **a good number of prominent companies with a stake in the ICT sector moved a considerable part of their R&D to Hungary**, and mainly to Central Hungary. There are some positive examples across the country but **Budapest keeps developing at a greater pace**, leaving the other regions actually underdeveloped. In fact, the gap between the capital and the rest of country is growing ever larger as are other inequalities (mainly in Eastern Hungary).

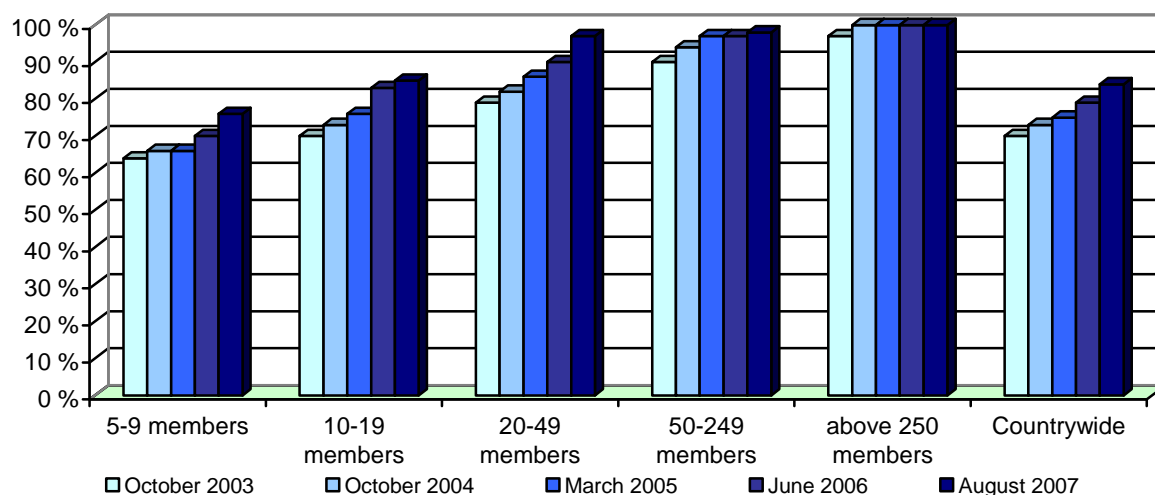
3. The Web and Hungarian companies: internal market in delay

Network “services” that preceded the World Wide Web, such as Gopher and e-mail, first appeared at the Budapest University of Technology and Economics (BME) at the beginning of the 1990s. The .hu domain was also administered here before the Council of Internet Providers (NIC) was established.

There has been a constant time lag in regard to the development of the Web in Hungary since then. This means that **the successful web pages and online business models in countries that occupy the top ranks of the e-economy are introduced to Hungary with a typical 2-3-year delay and in an adapted form**. There are hardly any web pages with truly innovative ideas, but **at the same time the knowledge of Hungarian web developers**, the technological solutions they use, and the quality of their design work **is there with the best of the world**.

While some of the data of the ICT industry in Hungary can even be regarded as spectacular, the population, government and corporate **user markets are not highly developed**. This is well illustrated by the GKIE-NET research data presenting the longitudinal rate of change.

3rd Figure: Changes in Internet penetration in businesses with a staff of over 5 members between October 2003 and August 2007 (percentages in businesses with a staff of over 5, members, n=1.000)



Source: GKIeNET

According to surveys monitoring corporate ICT usage, **91 percent of businesses with a staff of at least 5 members used a PC in August 2007**, with **corporate Internet penetration being at 84 percent and only 46 percent had their own website** (this percentage was 55 percent for companies with Internet access). Businesses with a staff of over 5 members created their homepages relatively fast, but website penetration between October 2003 and March 2006 almost levelled off. Furthermore, **most of the launched webpages can be regarded as static**. The question arises: how long can a relatively **dynamic ICT production be sustained nowadays when the internal market**, i.e. ICT usage by the population, is virtually **underdeveloped**? Unfortunately, when it comes to the issue of exploiting the opportunities offered by e-business, a company or business that joined in at a later date cannot simply skip the initial stages and start off by adapting the newest technology. What is more, e-business operation requires rethinking business processes and restructuring in which technology plays only a lesser part (Nemeslaki et. al, 2004). This also means that in order for significant development to begin **company managers need a shift in their mentality**, which should be facilitated by the **introduction of a flexible and effective regulatory environment by the state** and the constant upgrading of corporate e-business operations.

4. Websites and online stores: dynamic growth – conservative visitors

In accordance with the worldwide *long tail*¹⁴ phenomenon, **virtually 20-30 homepages generate 80-90 percent of all daily downloads** on the Hungarian language Web, too. The maxim “**the one that enters the market first takes it all**”, which frequently occurs in the digital world, **can be felt in Hungary, too**. The most visited sites in Hungary, like elsewhere in the world, are the news portals (e.g. Origo, Index) and **social networking sites** (e.g. iWiW, MyVIP), but **thematic link collections (Startlap)**, which first appeared in Holland, also attract a large number of visitors. In regard to search engines, the initial success of Altavizsla, which was partly a Hungarian development, has been overtaken by the **dominance of Google**.

¹⁴ The phenomenon that has been known in statistics for a long time is called asymmetric distribution (a hyperbole corresponds to this in mathematics). On these curves the end stretching right is very long compared to the front. Chris Anderson wrote a book on the subject, entitled *The Long Tail: Why the Future of Business is Selling Less of More* (published in Hungarian in 2007). If we translate the phenomenon to the Web, it means that there are few sites that have a great number of visitors and there are a great number of sites that have few visitors. Accordingly, the Internet makes the contents and services that only few users are interested in accessible and cost-effective.

Surveys reveal dynamic growth in turnover in online stores; however, e-commerce constituted a mere 0.8-0.9 percent of the total turnover in the retail sector in 2006. This percentage in the EU 15 was 1.6-1.7 percent. There were about **1,800 legally operated web stores** in Hungary in October 2007, with **their numbers showing a dynamic increase starting from 2002. Further increase is impeded by the fact that the majority of Hungarian Internet users do not want to exploit the opportunity of electronic shopping.**¹⁵

The biggest and most successful Hungarian e-commerce site is **Vatera.hu**, a counterpart of eBay. The site has been profitable since 2004, and this year is also a kind of turning point by marking the beginning of a large enough volume of e-commerce in Hungary enabling an e-commerce website to operate profitably. **Auction sites are among the most successful e-commerce operations but many reserve – and purchase – flight tickets and accommodation** on the Internet.

5. Regulation: slowly following the market

The success of online retail businesses in Hungary was mainly hindered by the initially low number of visitors to these sites as well as by the **complicated regulatory environment**. Most retailers did not know **what licenses they needed to have for operating an online store** and no forums were available to provide such information. As a result, until 2006 **many web storeowners had to pay a fine and even close down their business**. In order to repair the damage caused by insufficient information available in regard to the opening and operation of web stores the Ministry of Economy and Transport set up the *elker.hu* Internet page in 2006, which provided help for the owners of new and already running online stores.

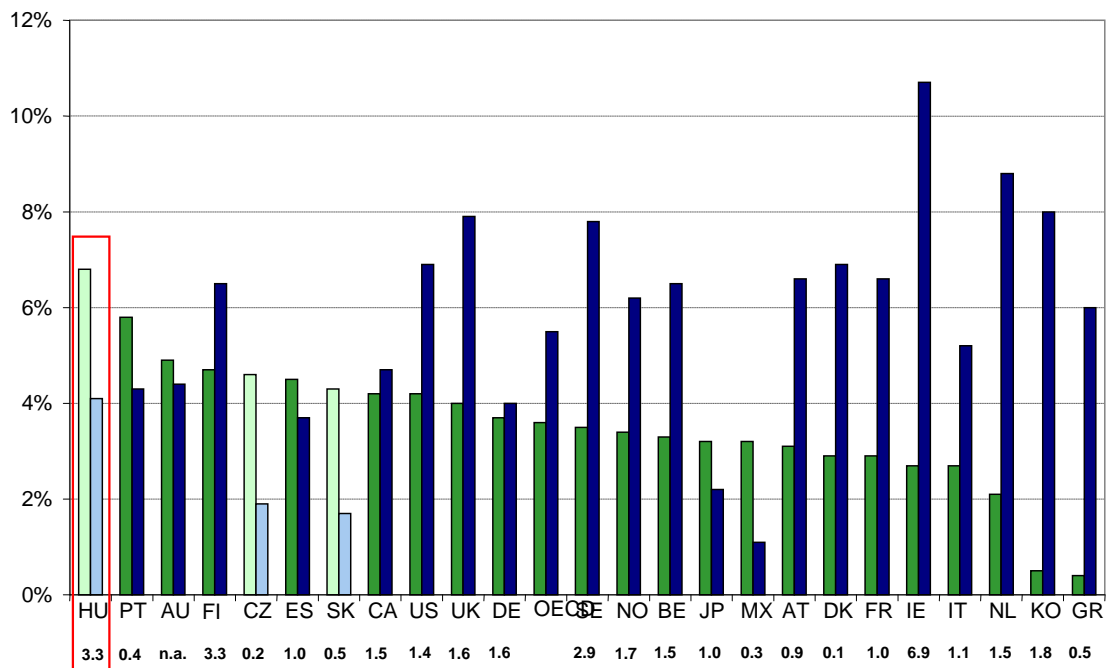
The **legal regulation of e-commerce** continues to be **slow in responding to the development of the market. Until 2007 e-commerce was practically handled by legislation in the same way as traditional mail order services;** therefore, even those e-traders that offered only digitalised goods on their websites were bound by law to maintain a retail outlet. The amendment to the regulations was passed by Parliament in summer 2007.

6. Added value generated by ICT: Hungary at the top of the rank

The percentage of added value generated by ICT activities is steadily increasing in all developing and developed countries. **In this respect Hungary's performance is outstanding,** since between 1995 and 2003 this percentage increased from 6.7 percent to 9.9 percent.

¹⁵ It is not our aim to decide whether this trend is good or bad. On the whole, the Hungarians do not “like” shopping via the Internet, perhaps because they are only starting to become familiar with this opportunity. Of course it is possible that Hungarians will continue to prefer traditional shopping. Obviously, there are advantages to e-shopping when certain products (mainly digital ware) are purchased, but it cannot be claimed that e-shopping is always “better” than traditional shopping.

4st Figure: Percentage of added value generated by ICT services as a proportion of added value generated by all the services (expressed in percentages, data from 1995 and 2003)



Source: OECD; Information Technology Outlook 2006

Among the countries of Central Eastern Europe Hungary's ICT expenditure as a proportion of GDP was higher than the average in the last ten years. In 2005 it was as high as 7.8 percent, and in 2006 – showing a slight slowdown – was 6.9 percent, and even with the latter Hungary stayed among the top-ranking countries. Considering the changes that took place in 2006 only Estonia and Bulgaria spent more on ICT in the region as a proportion of the GDP, which is a promising result in view of the coming years.

Internet: from subculture to mass culture

In ten years a diverse and dynamic **digital culture** which at the same time was burdened with limitations emerged in Hungary almost from scratch. Digital culture in Hungary has not reached the whole population and it has even formed an almost unsurpassable cultural divide between the different layers of society. Thus, a new system of inequality appeared in the information society. **This culture is marked by its own particular limitations and aspects:** restricted availability and the driving force of motivating users are of key importance. On the other hand, since physical distance does not define this culture like it does traditional culture, Hungarian digital culture has integrated some of the Hungarians living outside the borders and thus has led to a new national community.

I. The main eras of Hungarian Internet culture

The first era (1990-1995): when operating the system was a challenge

The first era was the golden age of the Internet culture in Hungary with creative and original solutions invented by engineers and computer wizards. The Internet (and the information sharing networks such as BBS, X-25, etc.) was virtually a subculture, and for the very few users also the opportunity for self-realisation. In this era **operating the system was a challenge**. This era began well before 1990, but we chose 1990 as a starting date because it was in this year that the **.hu** name server started its operation, initially in Amsterdam. This era and the achievements of its participant members represent a nostalgic memory: it was not the world of masses of users but one of pioneers, who actively and creatively exploited the opportunities they themselves produced.¹⁶ There is no clear borderline between the eras since a shift is generated by the continuous increase in the number of users. Those that joined in later were no longer focusing on the beauty of operating a system and did not look at the Internet as a means of self-realisation – for them it was increasingly a tool.

The second era (1995-2000): the day of modems

This era brought the slow but sure proliferation of the Internet in Hungary and a breaking out of subculture status. The number of websites increased and it was becoming natural that businesses, organisations, schools and more and more individuals could be found online. Online content was still little but started increasing, and websites with diverse contents were popular. One of the emblematic sites of this era was the Hungarian Electronic Library (MEK), which was virtually created as a labour of love and became the country's best-known source of digital texts.¹⁷

Since the Internet was generally narrowband and expensive this era required user-centred website development in which pages are clearly laid out and can be downloaded fast with a modem connection which supports off-line browsing. In this era **the Internet gained popularity but was expensive and slow**. A typical phenomenon of these times was the night Internet culture: due to high phone costs of using the Internet through a modem during the day it was worth logging on from home after midnight – a true net enthusiast could be identified by dark circles under their eyes.

¹⁶ It is of interest that one of the first Hungarian websites, called HIX (<http://www.hix.hu/>), is still active. This networking and knowledge sharing website offers a glimpse into the golden age of the Hungarian Internet.

¹⁷ <http://www.mek.iif.hu>

The group of users was no longer limited to “pros”, meaning that university students began using the Internet in growing numbers and chats as well as entertainment pages were frequented more often. **The first Sulinet (state project to support computer use) generation** – those young people who were familiar with digital culture in day-to-day education – **graduated** in this era.

This era marked the emergence of the **first free public emailing service in Hungary**, *Freemail*, launched in 1997.¹⁸ This service still enjoys popularity and continues growing: it reached one million registered postboxes in June 2002 and today it has over 3 million registered postboxes. When Freemail was launched, a nine-gigabyte winchester was enough to store the messages, and ten years later it required a 68 thousand gigabyte (!) storage space.¹⁹

The first Internet movement in Hungary that was open for all and could be developed by all was a continuously expanding thematic collection of links called **Startlap**, launched in May 1999. At the end of 2001 the 500th lap.hu site was created and at the end of 2007 it had 6.000 thematic subsections. Startlap is Hungary’s most visited front page, and its third most visited site in general with close to two million visitors a day.

The third era (2000-2004): Hungarian Web 1.0 thriving

The processes that started in the previous era reached their peak at the turn of the millennium with **a thriving digital culture available on an ever-increasing platform**. In these four to five years the price of Internet access began showing a promising downward trend and the number of broadband connections increased.

In addition to using the Internet, other in- and output “devices” of digital culture saw a widespread increase: **digital cameras, scanners and printers became more affordable**; data can be transported easier on pen-drives and similar means. Mobile phones became one of the key instruments (for many the only one) of digital culture thanks to the convergent features built into them.

The use of Internet and PCs is expected at workplaces as well as in people’s private lives. It has become completely natural to ask for someone’s mobile number or e-mail address instead of asking if they have these. ICTs and related skills play a more significant role than before, and a certain level of control slowly began to develop – postbox passwords are no longer insignificant data but well guarded secrets.

The previous situation was reversed: the minority is no longer represented by the users formerly regarded as dealing with something expensive and “in” but by the non-users who are under pressure from society. At some level the overwhelming majority of the population came into contact with some ICT, either by having their own mobile phones, digital cameras, PCs, etc., or by seeing one of these devices in their immediate environment. Digital solutions became more frequently used in schools, offices, in transportation, etc.

The fourth era (from 2004 to the present day): Internet on the verge of becoming mass culture

The number of broadband users began to increase dynamically from 2004: the Internet was used on broadband by a growing number of users. On 29th July 2007, there were 6.2 million visits generated by 1.5 million visitors²⁰ to the Hungarian web pages monitored by Medián Webaudit, while on 31st January 2004 “only” 1,357,434 visits were generated by 374,723 visitors, which means that in the space of less than three years the increase in the number of Internet users and in the rate of Internet use was about fivefold. The rate of increase is well illustrated by the fact that on 20th March 2007 the number of visitors to web pages audited by

¹⁸ <http://www.freemail.hu>

¹⁹ Users have been sending and receiving mail on [freemail] <http://www.origo.hu/techbazis/Internet/20071001-tizeves-a-freemail-1.html>

²⁰ The exact data are: 6,271,997 visits and 1,457,333 visitors (Medián Webaudit).

Medián exceeded 4 million, which was twice as many as the same number in March 2006. **Growth was steadily accelerating**: the number of visitors exceeded 2.5 million at the end of November, and only 4 months later the record 4 million was reached (Medián Webaudit). The increased online activity was partly the result of the Web 2.0 revolution, similarly to international trends. **The Hungarian Internet filled with life**, catering to all age groups and both sexes. In this era the Internet broke out of the confines of being used at universities and by the urban youth and **came close to becoming part of mass culture**.

An important cornerstone of this era is iWiW, Hungary's currently most popular social networking site. At the time of this chapter being written it has nearly one million individual visitors a day. The thriving of the online sphere in recent times is also demonstrated by the high number of Hungarian entries (over 100,000 entries at present, and it is continuously increasing) in Wikipedia. It is slowly becoming clear that a new era is on the horizon: mobile Internet and 3G mobile telephony enable users to access the Internet outside their home, workplace and hotspots; broader bandwidth increasingly caters to mobile, multimedia contents, and in a few years a switch to digital television broadcasting can be expected. All this enhances the expansion of digital culture, which takes an increasingly large segment of traditional culture. The proliferation of the Internet, the broadening of bandwidth and the increase in user numbers pose a serious challenge for traditional institutions and areas: the press, the post, the publishing business and library services, the radio- television-, and the film industries are increasingly coming under the influence of the Internet.

2. The main players of Hungarian online culture

In Hungary three quarters of the 16-year-old and older population do not speak any foreign languages. They are the users searching only Hungarian language contents (Társadalmi helyzetkép [Social Panorama], 2007). Hungarian is not a world language; therefore, digital contents in Hungarian can only exclusively originate from native Hungarian sources (Hungarian people and organisations). **The creation of Hungarian language contents played a crucial role** in the development of the information society in Hungary, and for a long time the small number of contents in Hungarian was identified as the main reason for the lack of interest in the Internet. With the Internet slowly becoming part of mass culture, Hungarian online culture needs to be developed. **In recent years Hungarian language contents and services** (not least thanks to the Web 2.0 revolution) **have expanded both vertically and horizontally and have become more inclusive**.

In the last ten years the Hungarian online sphere underwent numerous changes, with the most important trends being the leap in the number of users and the spreading of home (broadband) Internet. **The Internet in Hungary** (similarly to international trends) **broke out of its initial information consuming university and business environment and has become freer, more entertaining and natural**, as well as more diverse and consumer-oriented.

In the early period the Internet was a great opportunity for the **civil sector** due to the cheap, fast and efficient communication it offered. However, the initial impulse virtually died off and Internet use in the Hungarian civil sector is poor. The **academic sphere** had an immense role (not only in setting up the network and dissemination but also in content creation), especially in the first period. There are still some definitive organisations, such as SZTAKI (Computer and Automation Research Institute, Hungarian Academy of Sciences), which play a key role in the building and operation of the Hungarian Internet network. For example, SZTAKI created online dictionaries, a plagiarism browser and its own browser, which are popular and professional services even today.

Home Internet use has increased significantly since 2002 (it rose from 33 percent to 63 percent between 2002 and 2006 among all Internet users, according to the World Internet Project (WIP) data) and in 2007 almost

90 percent of households with an Internet connection used broadband. In the same period, the relative rate (its proportion within all Internet users) of school Internet use fell.

According to the WIP research data, in Hungary **the most frequently used Internet activity at present is e-mailing**, 84 percent of users being regular e-mail users. A significant proportion of Internet users primarily use the Net for **searching for information**, and almost **two-thirds** of them also use it for **entertainment and games**. The newest forms of communication, such as the **IP phone and chat**, are **only used by a smaller proportion of users**. **Internet users said that their Internet skills significantly improved throughout the past few years**: the number of those that identify themselves as having poor or not bad Internet skills greatly decreased. The majority of Internet users find the information on the Internet more or less accurate and reliable.

Internet use influences the use of traditional media in Hungary, too, and especially takes time away from time spent with watching television and listening to the radio. However, it is a progressive trend that today young people are “born into” Internet use (digital natives); therefore, they use it more readily and regard it more important in their lives than the older generation (digital immigrants).

The Hungarian online space is not too large. Two news portals share the monopoly position on the news market, the bottom-up collections of links are also massively dominated by some players, and the social networking sites also have a sovereign (at the present). **These leading sites define the online space: the top five most frequented ones are way ahead of all the rest**. Out of the five leading sites three were already in the same position in 2004 and the other two are social networking sites. Most Hungarian Internet users mainly visit these leading sites, and in addition they check some sites they pick on an individual basis. This **strong segmentation** primarily determines Hungarian online business and opportunities: it is difficult to penetrate the market with a newly launched site, and a greater part of online advertising is concentrated on the leading sites.

After a period of slow expansion Hungarian online culture began to thrive a few years ago. **There was a quantum leap in this area in recent years**. Similarly to the other parts of the world, **the Internet was initially exclusive to the informatics and academic sphere and then grew into a popular and diverse digital culture with an impact on the whole country**. Hungarian users are not the least different or less skilled than their counterparts anywhere else in the world. Since more than half of Hungarians are not yet part of digital culture their **eventual joining at some later point in time will further strengthen the accelerating expansion**.

Education and informatics: on the bumpy road from building the infrastructure to a shift in thinking

1. The key role of education

Education is one of the most important, or perhaps *the* most important area of building the information society. Most often the “informatization” of schools is at the cross-section of the education and the information society discourses. Naturally, the various educational software programmes, the digitalised teaching materials, content management systems and other educational ICT tools (interactive whiteboards, “voting machines”) as well as the IT tools used to make administration in schools (and between schools) easier require new teaching methods. Digital literacy will be another requirement: teachers and students will need to be able to use modern technologies and to be capable of high level information management (accessing and using information) individually and in groups.

The information society has also created the necessity of lifelong learning, which is based on the idea that learning does not stop after graduation and which claims that school is not the single institution of learning. Lifelong learning also poses a new challenge for those in the teaching profession: they have to teach their students autonomy in their learning.²¹ Therefore, **the focus of education in the information society should not be on the integration of ICTs but the overall reform of education. Informatics can only be a means to help students master the knowledge and the skills they will need to see them through their working life.** The quality of education determines social progress and economic potential in the long term. **In modern society high quality education is a prerequisite for long-term competitiveness and a high quality of life.**

2. Attempts at renewal

The need for the “informatization” of education and a change in the political system emerged around the same time in Hungary. The new public education act was adopted in 1993. The National Curriculum (NAT) of 1995 was one of the amended forms of this same act. **One of the problems faced by Hungarian public education is that its legal background is constantly changing, as a result of which it is losing its integrity, and above all, it is not transparent.** Unfortunately, the need for renewal in the institutional structure, the financing structure and in methodology is coming up against an increasing number of conflicts.

The radical changes introduced so far in education brought on resistance in teachers to educational policy. **There have been numerous changes but the situation is desperate in regard to the acceptance of educational policy concepts and the creation of a coherent policy (and especially its preservation).** As

²¹ The elaboration of these factors and the description of their network of relations would require far more space than what is available within the scope of the present report, as well as the explanation of the relevant conceptual framework. We simply wanted to indicate that the challenges that the educational system is facing at present are very complex and go far beyond the integration of IT equipment.

a result, the debates about pedagogy have fallen victim to the tug-of-war concerning the structure and financing of educational institutions.²²

In addition to the anomalies of educational policy, another problem is that the system of teacher training operates at a low efficiency. **In Hungary any significant methodological innovation in public education is initiated by only a few professionals in isolation.** One has the impression that in the long term renewal depends on the leadership of educational institutions, since individual initiatives can easily lose impetus if they are not encouraged and supported.

Secondary-level vocational training has also had its fair share of interventions. However, the structure of vocational training did not change dynamically enough and it is far from being modern (Z. Karvalics – Kollányi, 2006). **Employment policy, education, and microregional-regional development policy have not been handled together by local actors, which presented a major obstacle in implementing development projects adapted to given settlement groups.** On a positive note, so-called Regional Integrated Vocational Training Centres were set up with EU support. These centres link up educational institutions offering vocational training, their maintainers and partners at county level, by and large. This initiative shows a progressive trend, but has also revealed the lack of experience Hungary has in long-term strategic co-operation.

On the whole, **higher education did not meet the challenge of increasing student numbers, a trend which began in the mid-1990s and has only slowed down and stopped in the last one or two years.** This failure can be explained by the fact that **the number of teachers at colleges and universities virtually remained the same, as did their management and infrastructure.** This resulted in a number of higher educational institutions (and faculties) ending up in a desperate financial situation. Attempts at introducing the much needed reforms only began in earnest after 2002.

The Bologna process, aimed at restructuring higher education, is expected to have a greater impact than any other initiative. One of the objectives of the process is to separate bachelor and master programmes, thus making the distinction between colleges and universities redundant. Up to now institutions were interested in maximising student numbers (at least in departments with low-cost training), but the Bologna process makes it obligatory for institutions to “fail” a proportion of students at least at the end of the bachelor programmes.

Adult education, vocational retraining, further training and extracurricular activities offer a less clear picture, despite the fact that one of the key elements of the information society is lifelong learning. According to EUROSTAT Labour Force Survey 2004, less than 5 percent of the adult population (aged 24-64) in Hungary participated in training and education in the 4 weeks prior to the survey, while the average in the EU25 was 10 percent and in top-ranking Scandinavian countries (Sweden, Denmark, Finland) it was 27-36 percent. Hungary's percentage can be regarded as especially low since the time spent by young people in higher education has become longer and thus the figure includes those in their twenties (some of them earning their second or third degrees). In Hungary the financing of lifelong learning and, narrowly speaking, e-learning is basically built on a tender system, which practically means that these forms of learning have not yet become an organic part of work organisation culture and therefore they do not satisfy the needs of workplaces (employers and employees) but are ad hoc, depending on what tenders are announced at a given time.²³

²² In 1999 Imre Knausz warned of this in his article about the “deNATuration” of primary schools (Knausz, 1999).

²³ What is more, the actual realisation of the outcomes specified in supported tenders is still not monitored adequately.

3. ICT in education

The Sulinet programme (“schoolnet” in English), aimed at the “informatisation” of primary and secondary education, was launched almost simultaneously with the National Curriculum and in tandem with individual initiatives. Earlier on pupils and teachers in some schools used educational software in teaching mathematics and foreign languages, but these experiences were gained in isolation. **Considering the international trend the Hungarian government actually acted early when it launched its initiative in 1997 to set schools up with Internet connection and computers** (at places upgrading what was there already). By looking at the figures the programme was a successful one: the amount of hardware distributed and the number of networks set up reached the EU average. Yet, teachers and pupils did not come across ICT in school outside the IT lessons. What is more, in some institutions equipment was languishing in computer labs or was locked up in storerooms for months or years.

The downside of the Sulinet programme was that compared with other equipment used in schools **the constant need to upgrade the expensive equipment was a severe financial strain**. The system of **normative IT support** for hardware and software to be purchased **for schools** was introduced in the 2004/2005 academic year to improve the situation. It is less bureaucratic when the purchases are made through the Sulinet programme and it is hoped not to curtail competition on the market. The objective of the “*Public Education Informatics Development Programme*” launched in 2005 is to upgrade the IT equipment schools already have, including the introduction of school administration and management software.

However, information and communication technologies continue to be purchased in a tender system. In the future the “*Social Renewal Operative Programme*” and the “*Social Infrastructure OP*” (within the Hungarian *National Development Plan*) will provide development-renewal programmes to modernise technology and methodology in schools based on mainly EU funds. The most spectacular act of support – and also one that received the greatest response in the media – was given to so-called **digital trolleys and suitcases (multimedia presentation tools)**, while most recently the government announced the “distribution” of **interactive whiteboards** in schools.

Despite all the efforts, the use of ICTs has not been integrated into education as a whole. In Hungarian public education teachers hardly ever exploit the opportunity offered by ICT tools and the Internet (Benchmarking Access...).²⁴ Teachers give priority to books in their own work and in directing pupils’ learning, thus PCs and the Internet is more of an exception outside IT lessons.

The situation could actually be improved and PCs and the Internet could be better exploited in education, since only 15 percent of teachers in Hungary have no or minimal ICT competence.²⁵ What is more, only a relatively small proportion of teachers attach no positive outcome to ICTs used in their lessons. Despite all this, ICT use in lessons is extremely low: **in regard to classroom learning (not including computer labs), ICT is used in lessons in only 18.5 percent of schools!** In the meantime, a growing number of pupils have mobiles and home PCs with Internet connection. On the whole, the majority of schools in Hungary do not adapt to the information acquisition and communication habits regarded as natural by their pupils. The problem is that **if schools do not use computers and the Internet, they will not be able to address a digital generation “in their own language”**.

²⁴ Source: Benchmarking Access and Use of ICT in European Schools 2006 – Final Report from Head Teacher and Classroom Teacher Surveys in 27 European Countries. Commissioned by the European Commission and conducted by the “empirica Gesellschaft für Kommunikations- und Technologieforschung mBH” in co-operation with “TNS Emor”.
http://ec.europa.eu/information_society/europe/i2010/docs/studies/final_report_3.pdf

²⁵ The ECDL exam also forms part of the IT training programmes of teachers. These days in addition to the ECDL exam EP ICT (European Pedagogical ICT Licence) can also be taken in Hungary. Tens of thousands of teachers have participated in related programmes.

In the same category (ICT use in classroom teaching) the average of the EU25 is 61.4 percent. The figures clearly show that the integration of ICT tools in pedagogical work in Hungary is inadequate. It is characteristic of the situation that the largest number of teachers disagreeing with the statement “computers and the Internet are used in the teaching of traditional subjects and basic competences in our school” were in Hungary (38.5 percent of teachers agreed with the statement in Hungary, while this figure was 75.8 in the EU25). IT has become an optional subject at school leaving examinations in public education, which created a serious need in institutions to acquire the necessary equipment.

There are fewer data available in regard to processes outside public education. There is **an increasing trend for Hungarian companies to invest in the education of their employees**. The market is expanding but **compared with e-learning traditional forms of education** with hardly any or no ICT support **are in an overwhelming majority** (above 90 percent). Blended learning, which is the blend of e-learning and traditional learning, is more frequent in projects won through tenders.

Progress is continuous, even though it is slow. For example, **in 2006** the Ministry of Education **gave a commission for educational games**. One of these was *edutainment software*²⁶ called Freedom Fighter, which came out on the fiftieth anniversary of the revolution of 1956 and despite its name was well received. Another such software had the Hungarian Revolution of 1848/1849 as its theme and was launched in the second half of the same year. **Since there are a good number of Hungarian suppliers on the PC games market, these products might be the first step towards the emergence of a profitable industry.**²⁷

In the previous government term, between 2002 and 2006, the Hungarian Ministry of Education (together with the ministry dealing with informatics) wanted to lead the way in the social propagation of ICT use. At the launch of the **Sulinet Expressz** programme, which was modelled on a similar Swedish initiative, support given for purchasing ICT equipment was tied to school attendance, but not long after it was extended to all Hungarian taxpayers. Since Sulinet Expressz did not produce the expected results and on top of it financial restrictions were introduced, the programme was gradually phased out and was terminated at the end of 2006. The initiative received a mixed response since it did not bring about a breakthrough in regard to home use of PCs and other IT equipment. However, it did contribute to the proliferation of informatics in Hungary, even though not to the extent that had been hoped for.

While the Sulinet programme focused on purchasing equipment, its renewed version, the pilot of **Sulinet Digital Knowledge Base** (SDKB) launched in the 2005-2006 school year, **was aimed at making digital teaching resources available in as many subjects and cultural areas as possible**. The first open-ended teaching materials were received ambivalently and they need to be extended to additional subject areas, but there is hope for more creative input in the future. Within the SDKB programme the system of standardisation is being developed for **digital teaching resources**. Since these resources do not provide concrete syllabi for courses but contents and content design options, it has become especially important for schools in the project to test educational course management systems together with the digital teaching resources. Slowly but surely there is a change taking place in education, in regard to methodology and the way educators think.

²⁶ Coined from *education* and *entertainment*. Its meaning is teaching in an entertaining way.

²⁷ Of course there have been other successful educational games and software programmes on the Hungarian market, for example the game based on the Hungarian Conquest, played online regularly by thousands.

A recent history of research and development and innovation in Hungary

I. History

From the second half of the 19th century onwards, Hungary witnessed several outstanding scientific achievements – even though the fact that every Hungarian-born Nobel prize winner – with one exception – received this highest international award mostly for their work abroad makes the picture somewhat less rosy. The differences between working at home and abroad (in the “West”) still remain. Sciences and scientists received special attention from the state during the communist era, although despite the benefits this clearly had its uncomfortable disadvantages for certain scholars. Regardless of this, every now and then scientific schools of thought have managed to win international acclaim for their findings.

After the political changes in 1989-1990, there were drastic cuts in financing whilst autonomy in higher education was increased. In the 90's, the network of state-run R&D institutions almost completely disappeared: several research institutions were closed down, a great number of researchers laid off, and available resources cut everywhere. Fate dealt a perhaps even heavier blow to corporate R&D, the results of which are used more directly. Overall, by the mid-90's R&D spending in Hungary had shrunk to 0.5% of the GDP, and the same figure was between 0.8% and 1% after 2000, which is far below what leading countries spend (3-4%). The comparison becomes even less favourable if we look at the share of companies in total R&D spending – maximum a third of the total in Hungary compared to a much healthier proportion of two thirds in more successful countries (European Commission, 2006: 28).

2. Corporate R&D on the road to business success

During the communist era, heavy industries, which were emphasized, favoured and developed by the state, were mostly unable to achieve international success with their products. Technological development was lacking, as were new products, but, after the political changes, which brought about a freer market, there were no opportunities to experiment with these. **Therefore, modernisation mostly occurred where foreign investors used the best production technologies in their greenfield investments** (production was mainly for export). The one and only **exception was the pharmaceutical industry**: having been partly or fully privatised, production plants remained active players in innovation – today they account for the biggest private share in R&D financing in Hungary.²⁸ We can also find some **success stories amongst IT companies**, which had **grown into viable medium-sized enterprises from innovative micro-businesses**. One such firm, **Graphisoft is now a company limited by shares listed on several stock exchanges**.

At first companies (or rather, subsidiaries of multinationals) arriving in Hungary wished to conduct their research and development activities elsewhere. After the millennium this tendency started to change: apart from the pharmaceutical industry, there were pioneers in other segments too: General Electric was probably the first to keep and increase the team of development engineers in Budapest after it bought the Tungstam Com-

²⁸ Pharmaceutical concerns account for almost half of corporate R&D.

pany, a light bulb maker. Sony-Ericsson and Nokia both set up teams of engineers for research in mobile technology and at the same time started to commission R&D projects from university institutes. Apart from the above, there is a **long list of enterprises** – most of them in the market of information-communication technologies, ICTs - that **commission research institutes financed by the state to perform certain R&D tasks**. The **number of good examples is growing**, certainly also as a result of government intentions to encourage research investments of multinational companies in Hungary by offering tax breaks²⁹ and tailor made compromises³⁰ in certain cases.

Multinationals with an interest in ICT seem to have taken to a new practice, i.e. buying up innovative small enterprises, as in the case of Hungarian Telecom. An analysis of international trends shows this solution is likely to be popular in several industries in the future.³¹

3. Higher education and the academic sphere

The Hungarian Academy of Sciences (MTA) is a key player in basic and applied research in Hungary. Since it receives a grant from the state, neither its structure nor mode of operation has changed in the past fifteen years. The operation and performance of its parts or of MTA as a whole is difficult to follow or judge, and there seem to be significant differences. Certain MTA institutions took an active role in partnerships applying for funding in the European Research Area. The real value of government grants is decreasing, which encourages activities to find international and domestic sources of financing. However, it is exactly basic research – the main profile of MTA – where the amount of public funding to be awarded was reduced in the past 3-4 years. **Since 2006 there is increasing government pressure on MTA to change the way it operates and the MTA leadership itself has also initiated an internal debate on institutional reform.**

Universities and colleges are institutions with quite a lot of bureaucracy, which does not favour research activities.³² As a result, organisational units that carry out the actual research and development work have difficulties in establishing and maintaining links with companies interested in R&D. Although policy reforms since 2004 have been promoting the cooperation of industry and higher education (e.g. innovation allowance, cooperation criteria in tenders etc.), both parties have endured several failures, but not learnt from the consequences. Organisational units of universities or colleges attempt to find financing for their activities by applying for funding, while larger units (faculties or universities) had been able to find and utilise ample funding for infrastructural development since the millennium. **A success story in higher education: the basic ICT infrastructure has practically been continuously developing since the 1980's.**³³ *Mindentudás Egyeteme* (University of All Knowledge), an MTA initiative started in 2002, has been an extremely successful example of popular science programmes for the public, which has grown into a more and more complex project with an influence outside the world of science, reaching out to the whole of society.

²⁹ Tax cuts and tax base reductions are both used. See the site of the Hungarian Patent Office (Magyar Szabadalmi Hivatal) for more information: http://www.mszh.hu/ugyfel/vallalkozoknak/ado_vall.html.

³⁰ The media has named „lex Audi” the government decision, according to which R&D expenses are deductible from the so-called solidarity tax introduced in 2006. The reason for this decision was that Audi had stated that it would cancel its previously planned investment should the government introduce this new type of tax.

³¹ Enterprises in the pharmaceutical-life sciences sector whose patent is registered are given more freedom to spend their capital from their own research than IT companies have over their developments. This is mainly due to the current practices in intellectual property protection, the different market situations in different industries and differences in typical innovation activities.

³² A separate chapter discusses education in more detail.

³³ The first Informational Infrastructure Development Program (IIFP) was launched in 1986 as a result of a joint initiative of MTA and the National Technical Development Commission.

4. Policy objectives

As an innovation policy objective, government policies mainly focused on exploiting R&D capacities in higher education and academics – arguing that corporate R&D capacities were scarce – by offering tax breaks, tax base cuts, introducing the system of innovation allowance and requiring cooperation in applications for funding. Companies can launch R&D projects relying on instruments, labs and human resources at state funded institutions, applying for state funding – although they are obliged to provide 50% of funds as own resources. **In recent years government incentives have practically been pushing small and medium sized business towards “outsourcing” their R&D activities.**

One drawback in the past decade was that science and technology policies kept being moved between different government bodies. **No specialist body able to make responsible, strategic decisions has been set up as yet.** Since 1 January, 2004, the National Office for Research and Technology (NKTH) has played the leading role (except for basic research and targeted academic funds), but there are no signs of consolidation: in 2006 the first director was dismissed and a long “interregnum” followed, many people questioned whether there was a real need for NKTH. In the meantime, other bodies that in principle should have integrated efforts and played leading roles – like the Science and Technology Policy Council (*Tudomány- és Technológiapolitikai Kollégium*) and the Science, Technology Policy and Competitiveness Advisory Board (*Tudomány- és technológiapolitika és Versenyképességi Tanácsadó Testület, 4T*) – came close to clinical death.³⁴

5. Economic benefits of R&D: when?

As far as the volume of R&D and the amount of funds spent are concerned there are no signs of improvement, even though changes have been put in place that seem to work as incentives for businesses that have their domicile in Hungary to take steps in this direction. Domestic R&D activities have yielded few business benefits so far. Taking a closer look at the situation, it seems that there was a reason why the sudden uptake expected to come following the investments never materialised. Since 2000, the financial burden on businesses (wages and state contributions) has been significantly and constantly growing. As a result, there are fewer own resources left for R&D investments, whose return is uncertain. This is especially problematic because economic competition has become fiercer within the EU and **businesses and sectors that are not innovative can suffer a serious disadvantage.** Since there are no own resources at their disposal, **businesses in Hungary apply for funding**, but this solution also has its problems: **as compared to general conditions in the market, it is slow, inflexible and bureaucratic**, therefore only appropriate in the case of larger, more significant R&D projects. The development of such “revolutionary” products, services or procedures, however, accounts for the smaller part of corporate innovation. It is also questionable whether businesses wish to go ahead with their pioneering work in a situation more transparent for their competitors, i.e. by applying for funding.³⁵ Funding is specifically targeted at product and production innovation, although innovation in marketing and organisation probably suffer from a greater lack of resources.³⁶

The above means that applying for funding is problematic, but partly because of the companies themselves. Furthermore, directors of small and medium sized enterprises seem to be confused about exactly what type of innovation would be beneficial for their businesses or who could do such research and development work

³⁴ For more information see Pakucs – Papanek, 2007.

³⁵ Experts examining the applications can more or less tell its success, even though they cannot see the final result. Interestingly enough, when businesses account for the funds spent on a project the project itself can be successful without having produced any valuable results.

³⁶ Of course there are exceptions: INNOCSEKK offers opportunities for funding in this sector.

for them and how.³⁷ In addition, there are simple organisational reasons why businesses are inactive as far as innovation is concerned: most businesses in Hungary operate in sectors that are not innovation intensive.³⁸

Still, the difficulties of businesses cannot be compared to those in the field of higher education and academics – here we find some of the most difficult problems. Until quite recently, it was practically impossible to establish university spin-offs,³⁹ which rely on the selling of existing scientific results and knowledge in the market. Successful university departments or academic institutes could not expand their capacities as required for the market and were also unable to accumulate capital in the form of customised credit or investments, therefore they barely made any contribution to the performance of the national economy. With the Act on Innovation and the Act on Higher Education having been modified, this obstacle has disappeared and in some cases the establishment of spin-offs was encouraged.⁴⁰

The debate about changes that have been put in place since 2004 is still contentious, there was no ex ante impact assessment just as there was no ex post evaluation. There is no courageous and unambiguous guideline to accompany interventions that promote innovation – this is a deficit of domestic policies the impact of which can be felt quite strongly. **The Hungarian legislature has not undertaken the responsibility of selecting certain flagship industries, which would have meant incentives for research and development performance and would have made the implementation of further higher education and business developments justified.** Since 2004, the government has been trying to achieve this goal via the Cooperation Research Centres (KKK) that have little to do with basic research and the Regional University Knowledge Centres (RET). In both cases, by temporarily (for a period of 3 years) providing university R&D centres with capital, the government's aim is to set up research centres that are capable of becoming independent after the completion of the project and acquire the funds necessary for their operation from business orders and applications. KKKs are based on more detailed project objectives and a willingness to implement corporate-university cooperation in the long-term.

The mushrooming of spin-offs operating in life sciences and technology in recent years is a positive sign in research and development in Hungary. In the meantime, capital funds and venture capital companies have appeared, which are willing to invest in smaller, innovative companies. Their operation is further encouraged by the first capital guarantee fund in Hungary, Start Tőkegarancia Zrt, which was set up by the state at the end of 2006. **Innovation based on research and development seems to be taking a slow but definite upturn; thus we sincerely hope to see further steps in this direction in the coming decade.**

³⁷ For more information see the articles by Lehőcz (2007), or SZ.ZS. (2007).

³⁸ This was what Ádám Török, for example, emphasized. (2006).

³⁹ Small companies built on the marketable knowledge and experience of university staff.

⁴⁰ This of course does not mean that setting up spin-offs is now a simple process; conditions within a given university have a significant influence.

Conclusion – summary and suggestions for further research

Having reviewed the events of the last ten years it can be seen that the institutional framework of the Hungarian information society has been established, the basic infrastructure has been built up, enabling citizens, businesses and organisations to communicate with each other, acquire information and join the digital universe. However, the institutional system is constantly changing. For example, Hungary had a government commissioner of informatics and a ministry of informatics in the past but now informatics has no separate portfolio in the government. On a positive note, the monopoly position of Magyar Telecom in telecommunications had a major impact on the sector economically but then competition started. During the decade the framework for scientific research was also created and a good number of important civil initiatives were taken.

In addition, **ICT use became a natural part of everyday life**: mobile phones – which used to be called fads for the uneducated new rich – became an essential communication tool for all, and broadband replaced the dial-up Internet connection. In the meantime, prices of ICT fell, attracting an ever-increasing number of people, and the use of new technologies started spreading. In this regard, it would be worth **researching** the changes in the penetration of ICTs and establish **why Hungarians have such a negative attitude to the Internet** when they show such enthusiasm towards mobile phone technology.

Despite the important changes that took place in the space of ten years, **the issue of the information society was never given enough attention by the political sector** and it has not been recognised to the present day that the information society is far more than policies relating to technology or the building up of infrastructure, since it has a major impact on educational policy, R&D, social policy, economic policy, administrative policy, and many more key areas. The government's activity is characterised by unimplemented strategies, a partially built up institutional system and a lack of resources. In the field of politics our main suggestion for **research** is to examine **which countries that are successful in the coordination of the information society have practices that could be borrowed by Hungary, adapting them to the local circumstances**, with regard to the peculiarities of Hungarian political culture.

There are both successes and failures in regard to the individual areas. For example, PCs and modern communication technologies are used in **e-administration**, the basic infrastructure has been built; however the services offered are still not used by the great mass of people. **Hungary is on the way between old, bureaucratic administration characterised by snaking queues and new, customer-oriented, efficient and inexpensive administration** based on modern communication technologies. Unfortunately, it is yet to be found out how many stops need to be taken on this journey and whether a stopover is to be expected. At the present, the most important **research** task is **to identify the obstacles slowing down the spread of electronic administration** and the attitude taken by the main players in the area, from citizens to administrators and decision-makers.

It is not only the government whose work is inadequate. An important dilemma emerged in the new **economy**, too: how can a strong economy be built on a weak internal market? Investment into ICTs is no longer a competitive advantage but the basis of competitiveness. Hungary does not seem to recognise the truth of this and it is among the last of the OECD countries in this regard. ICT spending is low among citizens as well as businesses; what is more, all of Europe is behind the rest of the world. Although the proportion of Hungary's export of ICT products is impressive, its export volume is not high enough. Thus, a relevant **research idea** is

to explore **the reasons behind Hungary's ambiguous situation, i.e. the conflict between the advanced state of its ICT production and its underdeveloped internal market and low level of its population's readiness to use ICTs.** In addition, it should be researched how the former could work as a driving force for the latter two.

A similar ambiguity exists in **culture**, which is **split along a digital divide** although an increasing number of people use new communication technologies. The Internet and computer stopped being part of subculture and are slowly becoming an essential part of **majority culture** as mobile phones did a long time ago. A growing proportion of society have a personal experience of online culture, as the Internet had broken out of the initial confines of the academic and business world and with the web 2.0 revolution has become a daily tool used by the masses. Thus, **several research ideas** can be proposed in this area: to compare the cultural characteristics of **digital natives, digital immigrants** and those stranded outside the digital world; differences in the population's **cultural consumption** (e.g. traditional and new media); and to **explore the potential cultural consequences of a digital majority culture** on institutions, cultural policy and on everyday life in general.

High quality **education** is the foundation on which the information society can be built. **Hungary's competitive advantage** generated by the Sulinet programme launched at the beginning of the last ten years **has dwindled away.** What is more, **segregation** can be seen **instead of the integration of computer science into Hungarian schools.** The constant changes in education are contradictory, development is noticeable in isolation, and lifelong learning is still not part of Hungarian lifestyle. **A research question** that naturally arises is to study **the reasons for the segregation of ICT in Hungarian education,** and to explore what role the reluctance and distrustfulness of teachers to use ICTs play in this.

Hungary needs to catch up in the area of research and development too. Hungarian creativity did not become the guiding light of economic development after the change in the political system in 1989-90. Companies are not innovative enough, R&D expenditure is low and badly structured, the tender system in use is inflexible, The Hungarian Academy of Sciences is in need of reform, and the information portfolio is left again without a strong institution that would handle the area. However, the basic infrastructure is available and the system of innovation contribution gives reason for optimism, but in order to realise the potential benefit of these **a steady process of development is needed.** In the R&D sector it is worth researching **what innovation-intensive industries and areas should be handled as a high priority in Hungary,** and what instruments should be used to implement this the most effectively.

All things considered, **the last ten years cannot be evaluated as overall successful.** Although the system of institutions and the infrastructure to build an information society have been established, **the present situation is full of conflicts.** For example, the institutional system has "gaps" in places and the infrastructure has "holes" in it, so there is much still to be done in both areas. Unfortunately, Hungary's information society indicators are poor from one survey to the next, and in an international comparison the county does not occupy one of the leading positions or even the ones coming directly after those. Furthermore, there is a **trend in which Hungary is losing its previously held positions,** and Hungarian players are beginning to take on permanently subordinate roles in the international division of labour. Despite this, it can be stated that **the last ten years brought in radical changes,** and Hungary's accession to the European Union and the transition from the industrial period to the information age offer **such an enormous opportunity to catch up** with the rest of Europe **as never before in the country's history.**

Bibliography

- Bambano (2007): *Szubjektív kis magyar hálózati történelem* 2007. február 19.
(http://logout.hu/bambano/1016/szubjektiv_kis_magyar_halozati_tortenelem.html, accessed 28 November 2007)
- Benchmarking Access and Use of ICT in European Schools 2006* – Final Report from Head Teacher and Classroom Teacher Surveys in 27 European Countries. Az Európai Bizottság megbízásából az empirica Gesellschaft für Kommunikations- und Technologieforschung mBH és a TNS Emor együttműködésében készült (http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/final_report_3.pdf, accessed 28 November 2007)
- Better Portugal. eGovernment Strategy and New Public Service Distribution Model* (Lisbon, 2007)
- BME-UNESCO Információs Társadalom- és Trendkutató Központ (ITTK) - INFONIA Alapítvány (2005): *Elektronikus közigazgatás – Éves jelentés 2005* (http://www.ittk.hu/web/docs/ITTK_E-kozigazgas_2005.pdf, accessed 28 November 2007)
- BME-UNESCO Információs Társadalom- és Trendkutató Központ (ITTK) - INFONIA Alapítvány (2005): *Magyar információs társadalom – Éves jelentés 2005*
(http://www.ittk.hu/web/docs/ITTK_MITJ_2005.pdf, accessed 28 November 2007)
- Capgemini (2007): *The User Challenge Benchmarking The Supply of Online Public Services. 7th Measurement*
- Csepeli György (2004): *Digitális úton Európába*. Előadás az Információs Társadalom Oktató- és Kutató Csoportok workshopján, 2004. május 20.
- Department for Education and Skills (2002): *Get on with it* (<http://www.dfes.gov.uk>, accessed 28 November 2007)
- eKormányzat 2005 – Az e-kormányzat stratégia programozása* (2004) Miniszterelnöki Hivatal Elektronikus Kormányzat Központ, 2004. január 26.
(http://misc.meh.hu/binary/6715_letoltheto_strategia_rovat_ekormaynzat_strategia_programozas.pdf, accessed 28 November 2007)
- Első magyar Golden Blog* (2005) Hírbehozó hírblog 2005. május 19.
(http://hirbehozo.freeblog.hu/archives/2005/05/19/Els_magyar_Golden_Blog/, accessed 28 November 2007)
- eMagyarország az „eEurope: Információs Társadalom mindenkinek” magyarországi programja* (2000) Harmadik Évezred Alapítvány – Stratégiakutató Intézet, Európai Párbeszéd Alapítvány, MGyOSz, Budapest
(<http://www.inco.hu/inco3/vita/cikk1h.htm>, accessed 28 November 2007)
- Eneten Közvélemény- és Piackutató Központ (2005): *Lakossági Internethasználat 2005*
(http://www.nhh.hu/menu3/m3_1/2006/enetennhhInternet20054.pdf, accessed 28 November 2007)

- European Commission (2005): *Information Society Benchmarking Report* (http://europa.eu.int/information_society/eeurope/i2010/docs/benchmarking/051222%20Final%20Benchmarking%20Report.pdf, accessed 28 November 2007)
- European Commission (2006): *Annual Innovation Policy Trends – Hungary 2006* (http://www.proinno-europe.eu/docs/reports/documents/Country_Report_Hungary_2006.pdf, accessed 28 November 2007)
- European Commission (2007a): *eGovernment Progress in EU 27+*
- European Commission (2007b): *eGovernment Recourse Book. eGovernment Research in FP6*
- Eurostat (2005a): *Europe in figures - Eurostat yearbook 2005* (Luxemburg)
- Eurostat (2005b): *Internet usage in the EU25 in 2005* (http://epp.eurostat.cec.eu.int/pls/portal/docs/PAGE/PGP_PRD_CAT_PREREL/PGE_CAT_PREREL_YEAR_2006/PGE_CAT_PREREL_YEAR_2006_MONTH_04/4-06042006-EN-AP.PDF, accessed 28 November 2007)
- eEurope (2000): *An information society for All* (http://www.e-europestandards.org/Docs/eeurope_initiative.pdf, accessed 28 November 2007)
- eEurope+2003 (2001): *A co-operative effort to implement the information society in Europe – Action plan* (http://ec.europa.eu/information_society/eeurope/plus/index_en.htm, accessed 28 November 2007)
- eEurope 2005 (2002): *An information society for All* (http://ec.europa.eu/information_society/eeurope/2005/all_about/action_plan/index_en.htm, accessed 28 November 2007)
- GKI Gazdaságkutató Rt. (2005): *Az elektronikus aláírásról és alkalmazásaiból kapcsolódó monitoring felmérések* (http://www.nhh.hu/menu3/m3_1/esignomonitoring.pdf, accessed 28 November 2007)
- GKI – T-Mobile – SUN Microsystems (2007): *Jelentés az Internetgazdaságról, 2007 1.né* (GKIeNET kiadvány, Budapest)
- GKIeNET (2007): *Kutatás az informatikai eszközök használatáról a legalább öt főt foglalkoztató vállalatok körében* (GKIeNET kiadvány, Budapest)
- GKIeNET (2007): *Az online áruházak helyzete Magyarországon* (GKIeNET kiadvány, Budapest)
- Gyorsjelentés a World Internet Project 2005. évi magyarországi kutatás eredményeiről* (ITHAKA-ITTK-TÁRKI, http://www.ittk.hu/web/docs/WIP_2005.pdf, accessed 28 November 2007)
- Growth, Competitiveness, Employment: The Challenges and Ways Forward into the 21st Century - White Paper* (1993) Parts A and B. COM (93) 700 final/A and B, 5 December 1993.
- Halász Gábor – Lannert Judit (szerk.)(2006): *Jelentés a magyar közoktatásról 2006* (Országos Közoktatási Intézet, <http://www.oki.hu/oldal.php?tipus=kiadvany&kod=Jelentes2006>, accessed 28 November 2007)
- Holczer Márton (2007): *Moodle a gimnázumban* (in: INFINIT 2007 január 26., <http://www.infinit.hu/content/view/71/36>, accessed 28 November 2007)

- i2010 (2005): *A European information society for growth and employment*
(http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm, accessed 28 November 2007)
- i2010 eGovernment Action Plan (<http://europa.eu/scadplus/leg/en/lvb/l24226j.htm>, accessed 28 November 2007)
- Infonia Alapítvány (2007): *e-Kormányzat hírlevél 2007. évi számai*
- Az Internet kezdetei* (1997) (<http://www.caesar.elte.hu/hoskor/>, accessed 28 November 2007)
- Internet Szolgáltatók Tanácsa – Hálózati Koordinációs Központ: Statisztikák
(<http://www.nic.hu/statisztika/domain.html>, accessed 28 November 2007)
- Kalakota, R. – Robinson, M. (2001): *e-Business 2.0 – Roadmap for Success* (Addison Wesley, Canada)
- Kék Notesz 2007* (2007) Közreadja az eWorld és az ENAMIKÉ, Készítette a BME-UNESCO Információs Társadalom- és Trendkutató Központ és a GKINET Kft. kutatócsoportja
- Knausz Imre (1999): *Az általános iskola deNATurálása* (in: Új Pedagógiai Szemle, 1999/4,
<http://www.oki.hu/oldal.php?tipus=cikk&kod=1999-04-np-Knausz-Altalanos>, accessed 28 November 2007)
- Lehőcz Rudolf (2007): *Miért nem használják ki a K+F adókedvezményeit a cégek?* (A HVG cikkét az NKTH szemlézi: <http://www.nkth.gov.hu/main.php?folderID=774&articleID=5398&ctag=articlelist&iid=1>, accessed 28 November 2007)
- Lőrincz Vilmos – Tóth Attila (2006): *Önkormányzatok ICT használata és elektronikus szolgáltatásai* (GKINET Kft., Budapest)
- Magyar Információs Társadalom Stratégia* (2003) Informatikai és Hírközlési Minisztérium, 2003 november
(<http://www.gkm.hu/data/cms1057440/MITS.pdf>, accessed 28 November 2007)
- Magyar Informatikai Charta* (2000) Informatikai Érdekegyeztető Fórum, 2000 április
(<http://www.inforum.org.hu/doku/mic.zip>, accessed 28 November 2007)
- Magyar Válasz* (1999) Informatikai Helyettes Államtitkár, 1999 december
(<http://www.iif.hu/~lengyel/valasz/>, accessed 28 November 2007)
- A Matáv kiterjeszti a helyi hívásokra vonatkozó kedvezményt* (Sajtóközlemény 1998. december 26.
<http://sajtoszoba.magyartelekom.hu/process?action=notice&id=964>, accessed 28 November 2007)
- A Matáv kivezeti átalánydíjas konstrukcióit* (Sajtóközlemény 2002. április 29.
<http://sajtoszoba.magyartelekom.hu/process?action=notice&id=1306>, accessed 28 November 2007)
- Medián Webaudit (<http://old.webaudit.hu/index.php?content=211>, accessed 28 November 2007)
- MEH Elektronikus Kormányzat Központ (2007): *Kormányzati ügyfélszolgálat kialakításának koncepciója Magyarországon* (Munkaanyag)

- Millard, Jeremy (2006): *eGovernment for an inclusive society: flexi-channelling and social intermediaries* (Danish Technological Institute)
- Millard, Jeremy (editor) (2007): *European eGovernment 2005-2007* (Danish Technological Institute)
- Ministerial Declaration* (Lisbon, 2007)
- Miniszterelnöki Hivatal (2007): *e-Közigazgatás 2010 Stratégia* (Munkaanyag)
- Nemeslaki András – Duma László – Szántai Tamás (2004): *E-business üzleti modellek* (Adecom Kiadó, Budapest)
- Nemzeti Informatikai Stratégia* (<http://www.iif.hu/dokumentumok/nis/>, accessed 28 November 2007)
- NHH – havi vezetékes gyorsjelentés, 2007. augusztus
(<http://www.nhh.hu/dokumentum.php?cid=13324&letolt>, accessed 28 November 2007)
- Országos Közoktatási Intézet – TÁRKI (2005): *Az iskolai eredményesség vizsgálata*
(<http://www.oki.hu/oldal.php?tipus=cikk&kod=adatbázisok-isker>, accessed 28 November 2007)
- Open Community Response to the EU Ministerial Declaration* (Lisbon, 2007)
- Pakucs János – Papanek Gábor (2007): *Innováció helyett adaptáció(?)* (in: Népszabadság, 2007. augusztus 3.
<http://nol.hu/cikk/458904>, accessed 28 November 2007)
- Pintér Róbert (2004): *A magyar információs társadalom fejlődése és fejlettsége a fejlesztők szempontjából* (Doktori értekezés, ELTE, http://www.artefaktum.hu/Pinter_PhD_v2.pdf, accessed 28 November 2007)
- Pintér Róbert – Borovitz Tamás – Csótó Mihály – Füzesi Péter – Juhász Lilla – Székely Levente (2005): *Civil szervezetek az információs társadalomban és az információs társadalomért Magyarországon* (Kutatási Jelentések
<http://www.ittk.hu/web/kutatasok.html>, accessed 28 November 2007)
- Rátonyi G. Tamás (2002): *Matáv unplugged: véget ért egy korszak* (in: HWSW, 2002. április 29.
<http://www.hwsz.hu/oldal.php3?cikkid=666&oldal=1>, accessed 28 November 2007)
- SZ.ZS. (2006): *Adókedvezmény helyett koponyák kellene* (A FigyelőNet cikkét az NKTH szemlézi:
<http://www.nkth.gov.hu/main.php?folderID=774&articleID=5165&ctag=articlelist&ciid=1>, accessed 28 November 2007)
- Százezerrel több mobil-előfizető augusztusban* (<http://www.nhh.hu/index.php?id=hir&cid=2729>, accessed 28 November 2007)
- SIBIS New eEurope Indicator Handbook* (2003) (www.sibis-eu.org/files/SIBIS_Indicator_Handbook.pdf, accessed 28 November 2007)
- Társadalmi helyzetkép 2005* (2007) Központi Statisztikai Hivatal
(<http://portal.ksh.hu/pls/ksh/docs/hun/xftp/idoszaki/pdf/tarshelykep2005.pdf>, accessed 28 November 2007)
- Tézisek az információs társadalomról* (2000) Miniszterelnöki Hivatal, Budapest, 2000 február
(<http://w3.webliga.hu/ir/images/tit.rtf>, accessed 28 November 2007)

Török Ádám (2006): *A krétakör közepén: K+F és innovációs stratégiai dilemmák Magyarországon 2006-ban* (A Magyar Tudomány cikkét az NKTH szemlézi:
<http://www.nkth.gov.hu/main.php?folderID=774&articleID=4952&ctag=articlelist&iid=1>, accessed 28 November 2007)

Új Magyarország Fejlesztési Terv: Magyarország Nemzeti Stratégiai Referenciakerete 2007-2013 – Foglalkoztatás és növekedés (2007) A magyar köztársaság kormánya, 2007. május 7.
(http://www.nfu.hu/download/479/UMFT_HU_NSRK-hun_Accepted.pdf, accessed 28 November 2007)

Z. Karvalics László – Kollányi Bence (2006): Humán tőke és versenyképesség (in: Vértés András – Viszt Erzsébet (szerk.): *Tanulmányok Magyarország versenyképességéről*, Új Mandátum, Budapest)