This report is intended to spark thinking on what
the Global Information Society will be like and what are
the challenges and threats that Poland will face in order to
emerge as a full member of this global society. It is certain
that this society will use information and communication
technologies very intensively, but what will be the role
of people? What will be expected of people? What will be
the key to human development? How will this society
and its institutions be organized? What will be the hallmarks
of an electronic economy? Not all these questions are
precisely answered in this report, because nowadays no one
can really predict the final form of the Global Information
Society. However, the report points to development trends,
new phenomena, new challenges, and new threats.
This report is addressed to all who want to get
an understanding of the forthcoming changes and some
ideas on how to prepare for them.

Poland
and the Global
Information Society:
Logging on

Human Development Report

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Information Society:
Logging on

This year's Human Development Report, called *Poland and the Global Information Society: Logging on*, is already, the seventh report prepared by the United Nations Development Programme in Poland. So far, all reports have presented various aspects of Poland's development focusing on human development.

This year's Human Development Report differs slightly from its predecessors, primarily due to its subject matter. First, it is not limited to a single area of life or one social group. It encompasses many fields such as, the economy, labor, societal, cultural, and educational concerns. Secondly, its aim is to show perspectives for the future rather than to analyze the current state of affairs.

What will the economy be like if it is based on information and knowledge? What will work be like if it can be rendered remotely? How will the society function if electronic media enables personal contact on a mass scale? What will culture and society's economic role become in the face of globalization? What will be the new challenges of education?

The contributors to this report try to answer the above questions from the point of view of UNDP's concept of development. They focus on the changes that should be expected in relation to a dynamic development of information technologies and on the influence these changes will have on the quality of human life, and the opportunities and perspectives available to people.

I hope that this year's Human Development Report will make the public debate on Poland emerging as a member of the global information society broader and more intensive. Such a debate is necessary right now while Poland is still undergoing changes connected with its integration with the European Union. It must be remembered that understanding development trends, preparing for forthcoming changes and facing challenges as early as possible can accelerate development and cut down costs, which obviously benefits the society. For its part, the UNDP sees this report as the first step towards such a public debate and aware of the gravity of the subject matter — promises further intensive actions aimed at making this debate vigorous.

Marc Destanne de Bernis

Resident Representative
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Executive summary

Heading towards the global information society and adapting itself to the requirements of the European Union, Poland is currently witnessing two transitions. Imperfect as it is, the information campaign about the latter makes the society aware of the changes in process. Simultaneously, the former is often regarded as something remote and not treated as a crucial problem of the country. The truth, however, is as follows: integration into the European Union actually consists of making up for lost time that accumulated over the last 50 years, whereas, the shift towards the global information society is the challenge facing even the most advanced nations. Joining this challenge is tantamount to the struggle of defining the role that Poland and Poles will play in the world to come.

The global information society will be different from the society as we know it, just like this society is nothing like the agrarian society symbolized by feudal serfs, although the time span between the two is only a little more than a century, compared to the time scale of human civilization, this is not long. On the basis of the knowledge available today, this report sets out to show developmental tendencies of Poland's transition to the information society. One of the assumptions is that technical changes, especially those in information and communication technologies will translate into economic changes, which in turn, will cause social and life-style changes. Primarily, this report shows the expected qualitative changes caused by this process. In keeping with the concept of development elaborated by the UNDP, the report focuses on non-technical issues related to human development. Individual chapters are devoted to general social and economic changes taking place today, to the economy, labor, society, culture, and education. The purpose of the report is to prepare its readers for the forthcoming changes and increase the number of informed choices they can make in respect to their way of life, as well as the democratic choices of the entire society.

The report starts by presenting the general trends of social and economic changes and shows that the global information society and electronic economy are a natural effect of development and are thus inevitable. The complexity of the Polish dimension of creating such a society and such an economy involves the necessity to overcome major developmental discrepancies related to the coexistence of various economic and social models. The failure to face this challenge or facing it in a lackluster way may make Poland a nation of "three speeds", corresponding to the pre-industrial, industrial and post-industrial or information era, respectively. The necessary actions needed to harmonize and coordinate the transition must include the following areas: technology, people, law, enterprises and information resources. In the beginning, developing each of these areas separately brings positive results, but further improvement soon becomes impossible, because limitations from other areas set in. Therefore, Poland needs a social partnership for the global information society. Such a partnership should allow for cooperation of central, regional and local authorities with non-governmental organizations and the private sector.

The starting point for comprehending the forthcoming changes is the notion of a digital **product** or **service**, i.e. a piece of information in the form of text, voice, image, or software, converted into a string of bites that can be sent over the net. Electronic economy, as opposed to "paper" economy, is one where digital products and services are commonly used for performing business processes, such as promotion, advertising, marketing, negotiating and making contracts, post-sales services, administration services and financial services. This way of doing business is characterized by its independence from the geographical location of partners and customers, dramatically shortened reaction times to events, and a possibility of automatic reaction to business events, which leads to mass personalization

and individualization of customer service. A sector where digital products and services are not just tools for management, but also commodities to be sold, is of particular importance in the electronic economy. Such sectors are: information technology (software), media (information, publications, and entertainment), finances (banking, capital services, insurance, taxes, etc.), and knowledge (education, consulting in business, law, medicine, etc.).

The electronic economy has naturally evolved towards globalization, since the Internet — with respect to digital products and services — naturally removes all distance-related barriers. The Internet has no geography, all borders disappear. For countries like Poland, globalization offers an opportunity to reach global markets, but also presents the threat of facing new competition from remote parts of the world.

Competitiveness of individual countries in global electronic economy will first of all depend on their innovative capabilities and scientific potential. Therefore, the key issue for Poland is to restore the links between the country's scientific community and its economy, channeling the research towards the interdisciplinary needs of the global information society and electronic economy.

The public administration plays a crucial role in a country's movement towards the global information society. Improving its efficiency and reducing its operating costs is only possible by applying e-business solutions, which, furthermore, can give a positive boost to the entire economy. Moreover, legal changes are also necessary, both in terms of introducing new solutions, such as the digital signature (recently implemented in Poland) and penalties for new types of crimes.

Labor is, on the one hand, one of the foundations of the economy, and on the other an extremely important element of the quality of life. So, labor deservingly has a separate chapter in this report. Just like in the industrial society, where machines eliminated a great deal of manual work, one can expect computers to eliminate a large share of routine paper work. Human labor will be primarily engaged in creating new products and services, often for unitary use and for preserving relationships by communicating with other humans. Obviously, such a change shall not take place overnight, but this tendency will prevail and this will be the direction of the future changes in the workplace. A new phenomenon will be the expansion of telework, i.e. professional services rendered remotely over the net. Contrary to commonly stated opinions, telework does not have to be carried out at an employee's home. It can be performed at his/her office, a telecenter, or it can be one of the elements of the so-called flexible or mobile office. Telework can be extremely profitable to both the employee and the employer. Both sides, however, need to learn new skills and redefine their approaches.

A sizeable chapter in this report is devoted to the social consequences of the information revolution that will take place in Poland. Deployment of information and communications technologies is becoming influencing and correlating near all social activities. The report touches upon the problems of social development, the culture of wielding power and using civil rights, the spiritual and religious dimension of the society, as well as the life style of large social groups and the information culture of Poles. Subject to analysis, were various aspects of the influence of information and telecommunication techniques on the political life in its universal dimension applied to the specific conditions of Poland's young democracy. The authors of this report were especially interested in the following issues: what conditions must be observed if these technologies are to be helpful in developing an information society; is the upsurge of "telepolitics" not going to disturb the formation of the institutional infrastructure of democracy and political culture; to what extent can these technologies be assisted by self-organization and self-regulation capabilities of the society; how much can they do for reconciling the need for freedom with the right of privacy; what is the necessary strategy to avoid "overregulation" of the society on the one hand but not leave it "underregulated" to the point of inefficiency on the other? In a nutshell, the authors were tempted to answer the following questions: what needs to be done to make Polish society more creative and intelligent? What can be done to give it a more intelligent government?

The chapter devoted to culture aims to show the universal directions of development, as well as their reflection in Poland-specific circumstances, marked with lower development and cultural specificity of the population. The starting point was to draw attention to the extent at which media facilitates access to culture. For Poland this is a key problem if one

considers various effects of systemic transition, resulting in lowered social demand for culture, caused e.g. by the fact that vast number of the society have become poorer.

On the other hand, however, since the early 1990's Poland just like many other countries of similar development level has been witnessing some kind of a "media miracle", expressed by a fast growing number of households equipped with information and entertainment facilities of the quality incomparable to that of the past. One of consequences of this is the vanishing of the traditional model of cultural participation, which is being superseded by the culture of consumption. This is caused by the fact that an increasing number of commonly offered cultural goods come from private sources. Another reason is that Poland takes part in the processes of culture globalization that carries serious challenges, but simultaneously, creates an opportunity for Polish artists to win international recognition. Globalization of culture is deemed inevitable since symbolical goods are easily transferable over the net. This poses a serious problem for the state with respect to its cultural policy, just as the European cultural policy model seems to be becoming outdated. It was being shaped when the available culture was a culture of choice. Today this culture is pushed onto the market by the media and the global culture industry. Under these circumstances a debate on cultural policy and its priorities becomes a very urgent task.

The education system is of special importance in regards to the transition to the global information society. This report shows its goals: to teach people how to inquire, communicate, learn and be creative, in the face of increasingly available access to information and communication technologies or to information for short. To attain these goals, new teaching methodologies must be developed and implemented (using old methods incidentally assisted by computers will not be enough) and teachers must acquire new skills. It is necessary to teach learners how to learn and look for knowledge on their own, how to recognize and solve problems and how to work in a team (both interdisciplinary and international). The current model of 20 years of learning (including university studies) and 40 years of labor is becoming history. Life-long education will be indispensable in the information society, because every 5 or 10 years one will have to change his/her profession (and not only his/her job), and it is impossible to do that without continuous learning.

The conclusions of this report point to social exclusion as the major threat to Poland on its way towards the global information society. This exclusion should be understood in a two-fold way. First, it refers to actual (not declarative) exclusion of the Polish society as such from the commonwealth of the most advanced societies who are quickly establishing themselves participants in the global information society. Secondly, it means a dissection of the Polish society, whereby one part of the country participates in the global information society while the other does not. In fact, the problem of exclusion consists of being unable to follow the development. Avoiding this peril calls for investing in people, creating opportunities and possibilities of constant development and adapting to a world that changes at a quickening pace. Only coordinated actions and well-prepared strategies can make it possible. In Poland the state is the only entity capable of facing this task.

Introduction

1.1   Wojciech Cellary

Preface

Facing two simultaneous transitions, Poland finds itself in an exceptionally important historical time.

The first of these two transitions started in 1989, its purpose being to integrate Poland into the European Union. This encompasses two large processes: the democratization of public life, and the transformation to a market-driven economy. This transition consists of adapting Polish law, economy, institutions, and administration to the standards applicable in the European Union. This is a major challenge and the society is aware of it, although, not always fully. Integration with the EU is a hot issue in the media and is the subject of endless discussions and analyses among politicians and business leaders. However, strictly speaking, this transition means making up for delays and catching up with the most advanced economies of the world. One of the factors that make this pursuit easier is that the EU standards are well-known and have already been tested by EU member states.

The above transition seems to be overshadowing the other, the keywords of which are **global information society** and **electronic economy**. This transition is the biggest concern of the most advanced world powers that Poland wants to catch up with. The social awareness of this transition in Poland is clearly lower. Poles, even the well-educated ones, often seem to believe that it is a distant process only indirectly related to their country and therefore does not demand much attention.

The truth, however, is quite different. The advanced economies of the world will not wait for countries like Poland to make up for their delays. Poland must take an active part in this transition, which demands coordinating it with the other. By actively facing the challenges of transition into the global information society and electronic economy, Poland can make a leap over several stages of economic development, thus advancing at lower costs. This is of strategic importance to Poland, bearing in mind that the resources that can be allocated for both transitions are rather limited.

The global information society will be unlike today's society equipped with more computers and provided with better Internet communications. The electronic economy is not today's economy, though e-mail has superseded paper mail, the rest remains unchanged. The differentiating factors will be the changes in the basic functioning models of social institutions and economy.

The aim of this report is to identify qualitative trends of development in the process of transforming Poland's society into a member of the global information society. The word "information" as it pertains to people actually means having the knowledge necessary to both comprehend and internalize information, as well as create it. In this report, the phrase "information society" could well be replaced with "knowledge society", which is also frequently used in literature. The report, however, goes beyond that. It sets out to prove that the key issue for understanding the requirements of the global information society will be one's capability of life-long development. This capability is necessary because the amount of knowledge grows really fast on the one hand, and some of it becomes obsolete on the other. Those who fail to follow the development will run a risk of being excluded from the society. The very demand of life-long human development is

by no means a novelty. What is new in respect to the information society is the fact that the necessary changes will be deeper and more frequent. For instance, people will have to change their professions, not only their jobs, and they will have to be really prepared for such a change, otherwise they will not find a job in a competitive labor market. Both professional and private life will be much more saturated with technologies, especially computer-related. These technologies will be developing constantly and people will have to follow their development. Moreover, the information society is by nature, global, which will call for openness to foreign cultures.

The call for life-long development opportunities for all, is in keeping with the mission of the United Nations Development Programme (UNDP). In accordance with UNDP's concept, the purpose of this report is to prepare people for the forthcoming changes by increasing the scope of informed choices they can make while respecting their ways of life, as well as democratic choices regarding the entire society.

Owing to its thematic scope, this year's UNDP report has a slightly different form than those from previous years. When discussing such issues as, the development of agricultural regions or education, one can refer to vast resources of systematized scientific literature, various statistical data covering many years and comparative data from other countries. One can also take advantage of accepted methodologies of research. Therefore, one can present and support with evidence the current state of such issues in a given country and draw some conclusions. When it comes to the issue of the global information society such an approach is not an option. Today, no one really knows what the information society will be like. Moreover, no one even knows how societies of today will evolve into the information society, what will be really important at the consecutive stages of this evolution and how it will influence human development. There are no ready-made research methods — see Sections 1.2 and 1.3 — nor statistical or empirical data. With little more than 150 pages at their disposal, the authors of this report decided not to fill them with a lavish description of the current state of the Polish society and economy and quoted only statistical and comparative data if reliable sources were available. The bulk of the report is devoted to presenting the expected qualitative changes in such major areas as economy, labor, society, culture, and education. The report does not, and cannot, present a coherent vision of these changes heading towards a known target. The report presents developmental tendencies that can be identified and predicted today. Due to the wide range of topics to be covered, specialists acquainted with the changes caused by information and telecommunication technologies in their areas, were asked to present their own views. This approach resulted in a vivid, colorful, and sometimes controversial document. This report is not an *ex cathedra* lecture: it is an invitation to a public debate over Poland's transition into the global information society. This debate should be attended by the largest-possible number of social groups, including those who believe that the issue in question is not a problem that concerns them.

This report especially addresses the authorities, i.e. people who are responsible for the development of their country, region, city, commune, company, or even family. It is really unimportant whether this person of authority is a top politician or a leader of a small village community. What is important is whether he/she thinks strategically and wonders how to prepare the people he/she is responsible for to face the challenges of the future.

It is not the purpose of this report to evaluate the global information society. We do not try to say whether its way of functioning will be better or worse than the current situation. The report merely points to the directions of social and economic changes that Poland will have to face with respect to the global phenomenon of transforming into the information society. This transition, just as any other transition, carries both opportunities and threats, specific to individual social groups and areas of life. The report tries to identify these threats and opportunities in order to prepare its Readers to face them. However, the report has an optimistic, pragmatic message: **identifying a threat should translate into a development program, and identifying an opportunity should become a factor of expansion**.

One of the characteristics of this report is that it is clearly human-oriented. Therefore — paying due attention to technical and economic aspects — its main fields of interest are labor, society, culture, and education. The logic behind such an arrangement is as follows: scientific and technical progress, no matter what its inspiration leads to new business solutions, which in turn, are implemented in the economy. Changes in how business functions

necessitate changes in the forms, methods and organization of labor. Changes in the style of work, reinforced by availability of new products and services, change human lifestyles. Simultaneously, new technical solutions, economic changes, as well as work and lifestyle changes influence the organization of societies and social institutions. Culture and education become the key elements of participation in the global information society. Culture, because for the first time ever it is becoming a tradable good and a condition of economic success on the one hand, and plays a special role in preserving national identity under the circumstances of globalization on the other. Education, in its turn, is becoming a factor that conditions one's participation in the global information society, because education (covering one's lifetime, and not just the first twenty years) makes one capable of keeping pace with development, which is an immanent feature of this society.

Obviously, the report does not discuss every single issue related with the topic, because it is simply unfeasible. However, the authors hope that the report will be an inspiration for further consideration and research.

The report includes nine chapters.

Chapter one is an introduction. Apart from this very preface, it includes a section on the relationship between the information society and human development, as seen by the methodology worked out on the basis of UNDP, Human Development Index (HDI), and the concept of sustainable development.

Chapter two discusses the importance of social and economic changes on the way to the global information society and electronic economy. It first of all points out the need to harmonize the development of five different areas: people, technology, information resources, businesses, and law.

Economy is discussed in Chapter three. It presents the electronic economy, defined as an economy where digital products and services offered remotely over the net are the basic tools of management. The sector of intangible or digital products and services is described and defined as a sector of particular importance in the future. The development of information infrastructure, including but not limited to telecommunication infrastructure, is also discussed. Furthermore, Chapter three presents the problems of preparing Poland's economy to compete globally. It indicates the need to re-orient Polish science and research and inspire innovations so that they can assist economic development. The directions of structural changes in the public sector service economy are presented. Last but not least, selected legal changes are discussed. Chapter three is lavishly illustrated with statistical data and descriptions of detailed economic problems and models.

Chapter four is devoted to labor. It shows the main aspects of human versus computer confrontation in the labor market. The labor market in the electronic economy is discussed along with the need to teach people entrepreneurial skills in the face of growing competition where the greater dynamics of professional changes is emphasized. Expected changes in the structure of professions resulting from economic development are also described. Finally, the issue of telework, that is work provided remotely over the net, is presented in detail.

The society and social institutions are presented in Chapter five, in particular, such topics as information technologies versus human development, information society versus risk, scenarios of the future of the information society, relationship between the information society and the civil society, relationship between the information society and democracy, state versus information, freedom versus supervision, questions of content supervision in the Internet, cultural conditions of the information society, cultural changes in Poland versus the Catholic Church, organization of the public sector for the purposes of citizens and various styles of life and activity in the information society. This chapter is richly illustrated with statistical data describing the use of the Internet in Poland.

Chapter six defines the challenges that must be faced by culture. It discusses access to culture, culture industry, as well as new media and their influence on culture. It also shows the influence of globalization on culture, as well as the cultural context of the information society.

Chapter seven is devoted to the necessary changes in education resulting from the transition to the global information society. The educational needs were analyzed on the basis of distinguishing self-informing citizens, communicating citizens, citizens educating themselves and creative citizens. In addition, educational tools of the global information society

are presented. Chapter seven is illustrated with statistical data regarding the updating of Polish schools.

Chapter eight includes conclusions and recommendations.

Chapter nine presents the calculation method and the values of HDI and HPI indexes for Poland for the years from 1995 to 1999 and of GDI and GEM indexes for the years 1998 and 1999.

1.2   Kazimierz Krzysztofek

Information society and human development

Since this report has been published under the auspices of the United Nations Development Program, it seems reasonable to consider the relationship between human development and the information society. The very first question that comes to mind is whether the human development index (HDI), described in Chapter 9, can be applied to the information society.

Such attempts have never been made either in official UN documents or in literature devoted to the question of social development. The 2001 Human Development Report called *Making New Technologies Work for Human Development*[1] does not define the indexes of development of the information society either, but — and this is why it is very useful — it does point out the need to implement new technologies in developing countries, as well as use them in public administration which is responsible for preparing and introducing suitable development strategies.

The reason why reliable benchmarks for the information society are virtually unavailable is due to the fact that the concept of HDI is relatively new. It was introduced by the UNDP in 1990 when a rapid development of the global information society was only starting driven by advancing digital technologies and the Internet boom. Another reason, is that a true information society is only now becoming a reality in the most advanced economies of the world: North America, Western Europe, Japan, and several smaller countries of the Far East. It is enough to say that 80% of hosts are located in the said countries. Meanwhile, ca. 2 billion people worldwide do not have access to electricity, and the same number have never used a telephone. Therefore, the literature devoted to the global information society is increasingly concerned with the *digital divide*[2] of the world. As for today, it is difficult to state whether this is a temporary situation or an inherent component of global development. While the influence of industrial technologies on modernization processes is well known (on the basis of an enormous collection of data and evidence gathered in the second half of the 20th century by dozens of societies of various cultural backgrounds), the empirical data with respect to the diffusion of information technologies are relatively fresh and limited. The relation between culture and information technologies is discussed more extensively in Section 5.1 "Information technologies and civilization development".

Therefore, in spite of frequent use of the term "the global information" society, it is only in its nascent stage. Even in the societies with the highest level of information technologies, fast and cheap Internet access is a privilege of the few, because the problem of the "last mile" has not yet been solved. This problem consists in equipping households with broadband connections that enable access to the information highway. However, sooner or later, (or rather sooner than later) this problem will be solved and it is highly likely that such a solution will not demand "wiring the world", because fast progress has been made in wireless connection technologies. Regardless, the global information society, although still wet behind the ears, is developing so quickly that the qualitative changes related to it will outpace any projections and forecasts. What is certain, is the fact, that no society has ever been so saturated with technical infrastructure or so dependent on it.

1
Human Development Report 2001, Making new technologies work for human development. UNDP, Oxford University Press, Oxford 2001.

2
B.M. Compaine (ed.), The digital divide – facing a crisis or creating a myth? MIT Press, Cambridge Ma. 2001.

So far the HDI factor has been helpful in standardizing the terminology related to the notion of social development, without which comparative research would be out of question. It is an objective and synthetic measure that allows one to estimate the level and dynamics of development of individual countries.

Previously used indexes, such as life expectancy, literacy index, general scholarization index for all education levels, the GDP per capita or the aggregate of many sub-indexes, surely do not suffice in describing the development of the information society. We are unable to precisely define the correlation between life expectancy and the saturation of information technologies. However, the fact that medical development depends on the progress of these technologies implies a positive relationship. This relationship is even greater and more obvious with regard to the general scholarization index for all levels of education. In this case it is impossible to calculate the index without considering education offered over the net or the Internet access as such. As far as the literacy index is concerned, it cannot be applied to the information society, although literacy is obviously indispensable at the current stage of computer technologies, however, of greater importance is the *communication skills* index which refers to the capability of using modern means of communication.

With regard to GDP per capita, the fact that the highest level is attained by countries with the greatest density of information infrastructure (apart from several oil exporting countries) indicates that there is a considerable relationship between GDP and IT levels. In a nutshell, the information society offers more choices, thus increasing one's power to adapt, without which one cannot imagine surviving in the rapidly changing world[3].

Elaborating a global report focused on HDI seems premature, because the subject matter in various parts of the world is still incomparable. However, one should be intellectually prepared for it and this is one of the aims of this very report. Many factors indicate that a new attempt at standardizing the statistical measuring of social development in the global information society will soon be necessary. Without this will be impossible to define this development in a given country and compare it to others.

1.3   Kazimierz Krzysztofek
Sustainable development and information society

Research as to the influence information technologies have on *self-sustainable development* is being carried out at various research centers all over the world. This research is very useful when investigating the interdependence of *human development* and the information society. Although the two phrases in italics are not synonyms and largely depend on each other: the concept of self-sustainable development is the intellectual background of human development, developed by researchers related with the United Nations Development Programme, as well as by other researchers[4].

The concept of human development was created out of the need to extend scope of understanding of the notion of "development". The concept of narrow, technical and economical understanding of development was abandoned, because it did not appreciate the cultural dimension, nor the mental or social well-being of people, and its main expression of success was a growing GDP index. Researchers do not question the importance of this index or the role of economic development plays in developmental processes, but they treat economic growthmerely, as a means of pursuing developmental goals. In doing so, they join the theoretical and methodological trend referred to as an *alternative, non-modernist and non-dependent paradigm*. Therefore, the first UNDP report coined the notion of steady human development that came to be classified as one of the fundamental terms of the above trend. Subsequent reports have re-addressed the term and made it more precise. This is how the concept of *sustainable development* was arrived at. It refers to a process

3
N.E. Harrison, Sustainable development as social adaptation. Paper presented at the 41st Annual Convention of the International Studies Association, Los Angeles, CA, March 15-18, 2000.

4
A.L. Hammond, Digitally empowered development. Foreign Affairs, March-April 2001,

of "expanding the rang of human choices and using human skills by shaping the social capital in a way which satisfies the needs of contemporary generations in the best possible way, and without infringing on the needs of future generations". Research and studies on establishing a more precise definition of "sustainable development" are still under way. There is also intensive research on individual aspects of sustainable development in such areas as agriculture, land use, industry, services, tourism (so-called alternative tourism), and even creating a sub-area of scientific knowledge (*sustainable knowledge*)[5].

Generally speaking, sustainable development should first of all result in:
- limiting poverty in individual countries as well as all over the world. First of all, it should protect people against famine and malnutrition by enabling increased production of food with no harm to natural environment;
- increasing the number of houses, e.g. by promoting cheaper forms of construction for the less wealthy;
- better and more common accessibility of healthcare services;
- better education and higher scholarization indexes on all levels;
- more extensive use of natural and renewable energy sources[6].

When defining the influence of information technologies on sustainable development, it is usually pointed out that these technologies:

Natural environment	• accelerate the shift from material-intensive to knowledge-intesive technologies which do not involve such a large scale of raw materials consumption, thus easing the tension between human development and preservation of natural resources; • uenable more efficient investigation of risks related to decreased bio-diversification of the planet, growing ozone hole, hazardous waste disposal, desertification and climatic changes;
Economy	• restructure the infrastructure of economy by replacing material-intensive technologies with effective, high technologies; • enable sudden development, increase efficiency of market regulation, enrich the array of economic goods and social services (e.g. medical services, education, preventing disasters and/or soothing their effects), reduce transaction costs, flatten organizational hierarchies and facilitate the supervision of production, distribution, and consumption processes;
Politics	• strengthen the government by equipping it with tools for central planning and management wherever it is necessary (especially with respect to the allocation of natural resources); • create an opportunity for inter-ethnic solidarity due to a denser communication network, and thus enhance political stability; • replace the authority of coercion with the authority of persuasion;
Society	• dramatically reduce divisions resulting from sovereignty; • reinforce international systems of regulation and increase their capacity of establishing standards and regulations in order to check abuse in resource management, as well as governments' capability of controlling the observance of these standards; • create international, self-supporting societies; raise the awareness of human rights, environmental protection and other key issues of transnational importance; • increase international pressure and make people sensitive to the question of environmental protection.

5
K. Krzysztofek, M.S. Szczepański, Zrozumieć rozwój: od społeczeństw tradycyjnych do informacyjnych [Understanding the development; from the traditional to information societies]. Wyd. Uniwersytetu Śląskiego, Katowice, in print [in Polish].

6
ibid.

Source: Duan Qing, Sustainable development & information technology. University of Maryland, Harrison Programme for Future Global Agenda, 17 July, 2001.

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It is easy to notice that the above table show positive aspects relating mainly to the natural environment. Important issues related to culture, whose connection with sustainable development is self-evident[7], were omitted. Similarly, the problem of mutual relations between technologies, democracy and civil society is not considered deeply enough. This is a serious omission, if one considers that this very problem will be one of the key points of interest of the Human Development Report 2002. This is also why this year's report discusses this problem to a considerable extent.

The latest analyses of the influence of information technologies on sustainable development inspire researchers to reconsider its essence, because so far its philosophy has been marked with attention paid to threats characteristic for the industrial society. Meanwhile, the global information society — although just as any other society it is not free from threats — creates opportunities previously unheard of that must not be wasted.

Sustainable development, as understood in the industrial society, centered around the assumption that the volume of exploited natural resources and the level of industrial emissions should be balanced by self-regeneration capability of the planet. In 1987, the World Commission Report on Environment and Development called *Our Common Future* defined sustainable development as development that satisfies human needs without depriving future generations of the ability to satisfy their needs[8].

In the global information society we still must be careful when identifying our priorities: what should come first — natural environment, human dimension, or economic growth? Nevertheless, another entity comes to the forefront: added value is being replaced by added intelligence and creativity of an individual. The information society nurtures diversity and reinforces individuals. These are the cornerstones of ideal social development, as defined in the report of UN's World Commission on Culture and Development called "Our Creative Diversity"[9].

Although the way of using a tool has always depended on humans, today the human factor in the human versus environment relationship becomes of absolute importance, because human creativity plays a most decisive role. Therefore, we need a redefinition of sustainable development — not only the means, but also the objectives must be changed[10]. It is not going to be an easy task. The expansion of information technologies results from two factors: first, from the potential of knowledge and innovation accumulated and constantly expanding in hundreds of universities and R&D centers, and second, from the free market as a flexible system of regulation and diffusion. To a considerable extent, this mechanism acts automatically towards greater environmental safety (clean technologies) and economic growth, propelled by market globalization. This growth is ever-less dependent on a cheap workforce and supply of materials and increasingly dependent on knowledge. This fact leads to complications in other areas of life: politics, public order and culture, which are connected to a changed hierarchy of values[11].

Meanwhile, sustainable development makes sense only as long as it ensures viability in all areas of life, that is in economy, politics, ecology, society, and culture. In economy, it should concentrate on exploiting renewable resources (including knowledge and information). With respect to politics and government, viability depends on ensuring freedom of individuals, protection of human rights and the sensitivity to common values. There are many examples of the beneficial influence of information technologies in this respect: free flow of information world-wide renders all dictatorships transparent.

Preserving a life-friendly environment calls for preserving rich diversity of life forms and biosystems or at least setting limits that will ensure survival and regeneration of species. Also here, it is impossible to overestimate the support offered by information technologies.

If sustainable development is to respect social and cultural requirements, it must preserve the foundations of communities and protect symbolic systems that stem from culture and nourish it, ascribing meanings to people[12]. Majid Rahnema calls it a *life support system*, which is defined as: "a set of culturally consistent ways and means and attitudes that the members of a given human group, with their particular history, have developed after long and elaborate processes off trials and errors in order to cope with their life problems and move ahead the best of their abilities"[13]. The life support system is a social capital that provides self-governance through norms. Without this self-governance, one must count on external governance, which is usually imposed and qualitatively different. Depletive cultural capital management, (which apart from norms and the self-governance offers knowl-

7
D. Throsby, Sustainability and culture. Some theoretical issues. International Journal of Cultural Policy 4, 1, 1997.

8
P. Ekins, Limits to growth and sustainable development: grappling with ecological realities. Ecological Economics 8, 1993.

9
Our Creative Diversity, Report of the World Commission on Culture and Development. Printed in France, 1995

10
Duan Qing, Sustainable development & information technology. University of Maryland, Harrison Programme for Future Global Agenda, 17 July, 2001.

11
ibid.

12
D. Goulet, Authentic development: Is it sustainable? In: D. Pirages, Building sustainable societies – a blueprint for a postindustrial world. M.E. Sharpe, Armonk 1996.

13
M. Rahnema, Under the banner of development. Development 1-2, 1986.

edge, value, meaning and skills) even on behalf of modernization and progress, is the shortest way to chaos and losing the role of preserving sustainable governance which is essential to every culture. There are many examples showing that information technologies make it possible to protect and retrieve this cultural capital, promote cultures world-wide, and raise international awareness of the need to save cultures.

In order to preserve its human dimension, the global information society must change not only the means, but also the goals of development. At a world summit, that took place in New York in February 2001, the awareness of the above fact was witnessed, not only by NGOs, but also by governments and business people. This awareness is, not only a question of good will of global powers, but a question of the very change in the paradigm of development — from industrial to postindustrial. One has in mind a process of a constant change: building developmentally more balanced societies and existing in them in a way that does not demand ecological asceticism, impose vegetarian diet, or promote expiatory clothes. This trend towards a more balanced world can give people a new aim that will replace the worn-out ethics of profitable work with a new paradigm[14]. In the wealthier societies, this trend is already noticeable, which is evidenced by the research of Ronald Ingelhart[15] which shows a need to address the post-material and under-consumption values.

Therefore, the problem is not to "act better in the old way", but to implement new ways of thinking and acting, that reach beyond the imagination of the industrial society. Sustainable development in the global information society equals a new way of thinking that covers a much deeper meaning than before[16]. This type of society concentrates on the human-to-human relationship. The quality of this relationship defines virtually everything else: the quality of natural environment, society, culture, and political order.

[14]
D. Pirages, Building sustainable societies – a blueprint for a postindustrial world. M.E. Sharpe, Armonk 1996.

[15]
R. Ingelhart, The silent revolution: changing values and political styles among western public. Princeton University Press, Princeton 1997.

[16]
Duan Qing, loc. cit.

Social and economic changes

2.1   Wojciech Cellary
Social changes

In order to understand all the challenges that we will have to face in the near future, let us take a look at three kinds of societies: the agrarian, industrial, and information societies, which to a certain degree correspond to the past, present, and future. We will not characterize all these types of society in all their complexity, which would be simply unfeasible in this report. We will analyze the notion, meaning, and role of knowledge in all three societies, paying special attention to science as the source of knowledge and education as the tool of promoting knowledge. Taking a look at the transition from the agrarian to the industrial society will help us predict the changes that will take place in the years to come, when the process of transition into the information society will accelerate. It is worth noting that the way of perceiving social changes as presented below is very simplified and is aimed only at highlighting the forthcoming challenges.

Agrarian society

In the agrarian society, people were the main source of energy, in the sense that if somebody needed a service involving some energy consumption, he/she employed a human for that very purpose. For instance, if somebody (e.g. a king) wanted to have a ditch dug, the only way to achieve that was to order somebody to dig it. Obviously, humans were not just a source of energy. Human knowledge was greatly valued in the agrarian society. However, the word "science" was not understood in the way we understand it today. It referred to rhetorics, grammar, logic, music, etc. Science, understood in that way, was complemented by the skills of carpenters, blacksmiths, potters, shoemakers, etc. Only a narrow group of the agrarian society had access to knowledge. In those times, access to science (in the above meaning) was typically a privilege of monks and noblemen. Knowledge was transferred by means of books, which were something rare and expensive, or by means of scientific discourses, taking place in cloister ambulatories or refectories. This part of knowledge was indeed transferable, but it was not practical, contrary to the knowledge possessed by master craftsmen. However, it was not easy to transfer the knowledge of a master craftsman to journeymen. A journeyman learned by observing his master, and his education took up to half of his life. The most important feature of the agrarian society was the accumulation of three roles by a single person: a master craftsman created knowledge, used it and transferred it. Indeed, he was the maker of new technologies, i.e. the creator of knowledge; he manufactured tangible products and services, thus used the knowledge; finally he taught his journeymen. However, passing over his knowledge was not in his own best interest. Although a medieval master craftsman would probably fail to quote the contemporary wording of the right of supply and demand, he was perfectly aware that dissemination of his knowledge would lead to increased competition on the market and reduce his revenues. It is evident that restricted distribution of knowledge blocked the development of the agrarian society.

Industrial society

Beginning with the end of the 19th century one can notice the tremendous develop-ment of the industrial society. Economy was no longer focused on food production, which had been superseded by raw materials and consumption goods. There was a 50-fold increase in productivity within just eighty years, which is but a blink of an eye when com-pared to several thousands years of the agrarian society. Large groups of people migrat-ed from rural to urban areas. Monarchy, as the dominating political system, was super-seded by democracy. Consumption goods, regarded as luxury until recently, became gen-erally accessible. The lifestyles changed dramatically. The above changes relied on two technical inventions: steam engine and electricity. One could ask: why these, and not any others? The answer is as follows: the steam engine became an unlimited source of ener-gy and electricity made this energy commonly available. Humans were no longer the source of energy. They lost the attribute that defined their usefulness to society: their abil-ity to perform work based on energy was no longer needed, because machines could per-form this work in a cheaper, faster and better way. In the industrial society, the irreplace-able attribute of humans was their intelligence. For the purpose of this chapter, "intelli-gence" is understood as the ability to make the right decisions on the basis of one's knowl-edge. Human intelligence was necessary to operate machines at work, use consumption goods such as cars, gas cookers, television sets, etc., and to take an active part in democ-racy. The social level of intelligence depended on science which was responsible for cre-ating knowledge, and on education, responsible for distributing knowledge. In the indus-trial society, sciences: natural, human, technical and economical were both practical and transferable. Its aim was not only to understand nature, but also to expand and improve it, as well as to exploit it to develop the economy and society. Personal skills of scientists and researchers were transformed into general models and methods that could be quick-ly and indirectly taught to students. Fundamental, or primary education, was accessible to all members of the society. To a large extent, the costs of education were covered with public resources. The system used the following mechanism: 20 years of education (to university level) was followed by 40 years of work. Knowledge was no longer confined to master craftsmen; it was available in books. There were two coexistent views on the social and economic role of knowledge: a "non-profit" view and a "profit" view. In the former, knowledge was regarded as common value of the entire society, access to knowledge was free, and results of scientific research were generally available. Learning was also free, which translated into state-sponsored education for all. The profit-oriented approach regarded knowledge as private property, usually belonging to companies. Ownership of knowledge was secured through patents and licenses, which were used as means of trad-ing knowledge. Access to knowledge was paid for and offered by private education insti-tutions.

The most important remark on the organization of science and education in the indus-trial society is as follows: the three roles (making knowledge, using knowledge, and trans-ferring knowledge) were separated. Scientists, researchers, innovators and inventors were the creators of knowledge. The users of knowledge were producers of goods and services, and teachers were those who transferred knowledge. This separation of roles was one of the most important factors enabling rapid development of the industrial society. Because it was generally accepted that the lack of access to knowledge blocks development, societies decided to provide free access to public knowledge. Also private owners of knowledge were interested in its transferring, or — more precisely — selling it. The blocking factor in the industrial society was not any more the lack of knowledge transfer, but insufficient cre-ation of knowledge.

Information society

Let us now have a look at the information society. At the foundation of this society lie another two breakthrough inventions: **computers** and **telecommunication**. Their role is similar to that of the steam engine and electricity in the industrial revolution. Computers deprived humans of their monopoly on intelligence (again, understood as the ability to

make the right decisions on the basis of possessed knowledge). Obviously, computers as such are not intelligent — they can only recreate the real intelligence of programmers, but they behave like people making the right decisions. Telecommunication, in its turn, ensures common access to all computers connected to the net.

The transition from the agrarian to the industrial society showed that a revolution takes place whenever humans lose their usefulness to a new technology. This is why depriving humans of their monopoly on intelligent behavior — in other words, for decision-making — results in the information revolution. Just as machines eliminated humans as sources of energy in the industrial revolution, computers will eliminate humans as those responsible for making routine decisions. Computers will always outdo humans in carrying out any intellectual action that can be planned in advance.

If predictable, routine intellectual tasks (i.e. the most common ones) will be performed by computers, then one may ask what is left for humans. The answer is: creativity. Computers, at least as we know them to be today, are unable to create. They must be pre-programmed by humans. Therefore, creativity will define an individual's place in the information society.

The fact that non-creative human intelligence will gradually become useless (and be performed by computers) will have two consequences. First, humans will define what they need, and not how to achieve it, because computer-equipped devices will be so intelligent that one will need no knowledge to use them. Secondly, human intelligence will become a kind of sport practiced to fight information obesity, just like jogging is used today to fight physical obesity[1].

On the labor market, human knowledge and intelligence will be valued only as long as they are a basis for creativity. Human creativity will be necessary for constant creation of new products and services, where "new" refers to "individualized" and "personalized". Many products and services, especially the intangible ones, will be manufactured solely for the needs of an individual customer. Despite that, it will be possible to service such clients on a mass scale.

In the information society the most precious part of human knowledge will be put into computer software. The knowledge to be found in books will be first of all a basis to create software, which will be the tool, the method and the result of work. Apart from obvious advantages, the above fact entails serious threats. Knowledge will become a product, which means that it will be possible to use knowledge without human intervention. Knowledge included in software is more than practical — it is instantly executable (one can start an application and the computer will take the necessary decisions: it will, for example, buy stock at a stock exchange). Knowledge will also become subject to trade: instead of learning, it will be enough to buy software to enjoy the effects of possessing knowledge.

In the information society, the organization of science (responsible for creating knowledge) and of education (responsible for transferring knowledge) will also change as compared to the industrial society. Because a sizeable portion of the most precious knowledge will be included in software, the roles of creators and users of knowledge run the risks of becoming re-integrated. Let us remember that the *user of knowledge* here means the *maker of software*. It is therefore likely that the owner of software copyright will automatically become the owner of knowledge. Thus, knowledge will become non-transferable: it will not be available to users of knowledge, i.e., makers of software other than those working for the owner of knowledge, nor to teachers responsible for transferring knowledge.

In fact, the gravest threat for the information society is the return to the model of a journeyman and his master craftsman, which was so inefficient and blocked development for centuries. A conclusion appears that separation of knowledge creation from software making is an indispensable requirement of developing the information society. The aim and duty of information sciences is to ensure transferability of knowledge. In other words, humanity must avoid the situation whereby only software makers know what is inside their software.

A challenge for the education system in the information society will be to teach people how to be creative and how to pass their unique knowledge and original problem solving methods to computers. Today this skill is referred to as "computer programming". Being

Kazimierz
Krzysztofek

Poland —
society of
"three speeds"

or over ten years now, the Polish society has been undergoing a transition process which is simultaneously an adaptation to the market economy and building an open society. This process calls for reconstructing certain institutions, non-existent in the previous system, as well as creating new ones, the need for which results from the current status of the development of civilization. This is a tremendous challenge for all sectors of the public life.

For several decades, societies of established market economy and political democracy have been evolving from a system based on large, centralized industrial complexes towards knowledge-based production and information processing, generally referred to as intellectual technologies. The key word of industrial capitalism – "entrepreneurship" – is being replaced by "intelpreneurship". An ever-growing portion of human energy, creativity and innovation moves to the parallel world, or the virtual space. This is the gist of transiting from the industrial to the post-industrial society, usually referred to as the "information society".

The complexity of Poland-specific conditions pertaining to building such a society consists in the need to solve the problem of major developmental disproportions, related to coexistence of various historical qualities. The inactive period of the 19th century left the country with a legacy of a strong pre-industrial sector: agriculture (including peasant-like culture and mentality), which has been scarcely industrialized (collectivized or farmerized). The industrial sector, always relatively weak as compared to more advanced countries, in the second half of the 20th century developed towards large, centralized, hierarchy-based structures, accompanied by purposeful elimination of free

market mechanisms. The last decade has been a time of accelerated adaptation to the third stage of development, expressed as the post-industrial/information society. It has also been a time of an emergence of a new functioning culture for advanced technologies. The generation factor played a very positive role in this process.

The above paragraph shows the enormity of challenge to be faced by Poland as a state, economy, society, and culture. The structural framework of Poland's existence is defined by the laws of developing a society of "three speeds", corresponding to the three stages: pre-industrial, industrial, and post-industrial. Poland is indeed an agricultural, industrial, and information country, where the first two sectors, and especially agriculture, must be completely restructured. However, during the past decade, the bulk of restructuring efforts has been focused on industry.

The above causes a series of problems, but also creates some opportunities. The problems pertain mostly to social tensions, especially in the sectors who most directly feel the pains of adaptation, or – to be exact – non-adaptation. This can be very well exemplified by the political choices made by the Poles within the last decade. The essence of these problems consists in the fact that the three speeds cannot merge into the one average speed to be accepted by all, because it would be too fast for the slowest, and too slow for the most advanced. The chance for Poland is the third speed, but it must be remembered that the speed of an entire convoy – to use a metaphor – depends on the speed of the slowest ship.

Of course, there are also opportunities – first of all the advantage of delayed start: the technological infrastructure of the information society is

aware of the imperfections of contemporary programming languages, which are purely technical and oriented on computers rather than humans, we hope that entirely new methods of computer-to-human communication will be worked out. Common ability to pass one's knowledge to computers will be strictly necessary, because software will be the means of both expressing knowledge and transferring it. The education system must give the entire society the possibility to express knowledge and to gather it.

The education system in the information society will change under the influence of human creativity. As a consequence of creativity, the amount of knowledge will grow steadily and at a high rate. The life span of certain fields will be short. This will result in the changes in the need to learn. In the industrial society, universities taught how to use knowledge. In the information society, they will be forced to teach how to create knowledge. For an individual, conventional knowledge will be an indispensable condition of existence in the

labor market. Unconventional knowledge, however, will be an indispensable condition of competitiveness. Therefore, universities will be expected to teach originality.

The principle of the industrial society education (20 years of education and 40 years of work) is becoming obsolete. In the information society, every 5 to 10 years people will have to change their professions. Prior to that, they will have to learn the new profession. Educating institutions must respond to this need for lifelong learning.

The information society is a natural consequence of progress, and is inevitable. One can expect that the gap between the information society and the industrial society will be at least as big, as the one between the industrial and the agrarian societies. However, the changes will happen much more quickly.

The information society will offer development only for the educated. The real challenge is to educate all members of the society.

2.2   Wojciech Cellary
Economic changes

In this section we present a specific view on the economic development, which to a large extent, corresponds to the view on the social development, as presented in the preceding section. We argue that the electronic economy we are heading into is nothing unexpected, just a natural stage in economic development. To realize that, let us recognize that every economy, at any stage, is focused on goods that can be viably transported, and the way economy is organized depends on people's communication possibilities.

Agrarian economy

When the horse was the primary means of transportation the economy was focused on food. Interpersonal communication, which is indispensable in business, consisted of face-to-face meetings attended by people coming on foot or by horse. A supplementary form of communication was the exchange of letters — either carried by messengers or transported on horseback. The society was organized in such a way, so as to provide effective management of food. Because of the unique characteristics of the contemporary means of transportation and communication, the agrarian economy was strongly localized — the bulk of goods exchange, both in terms of quality and of value, took place between a town (the dominant concentration of people) and the surrounding villages and farms. The most prominent people in the agrarian society were the biggest land owners, because they manufactured the largest amount of food, the fundamental economic good.

Early industrial economy

A radical change took place when railway transportation gained a well-established position. It allowed for transporting raw materials, such as oil, coal, and ores, which — for obvious reasons — could not be transported on horseback. Thus, the economy began to focus on raw materials, and food was rendered less important. New fortunes, resulting not from owning land, began to mushroom. The symbolic example is the fortune of Rockefeller. The area where business was done was expanded thanks to the efficiency of railway transportation: while a horse needed one day to go from one village to another, trains were capable of traveling a distance of several hundred miles over the same period of time. When the telephone was invented, business processes started to be carried out remotely, without the need for face-to-face meetings. These changes were followed by major social changes, briefly referred to in Section 2.1: urbanization, development of democracy as the political system, general access to culture, changes in lifestyle, etc. All these changes were

so profound that they were described as the industrial revolution and the new society was labeled the industrial society.

Late industrial economy

Further changes, less spectacular and taking place over a longer period of time, were a result of popularizing cars as the major means of transportation. Cars made the economy focus on consumption goods and services: one cannot deliver a hot pizza by train. Simultaneously, the car as a means of transportation greatly intensified business meetings, the plane expanded their geographical reach, and the fax machine enabled instant exchange of documents between partners independent of their location. Just like before, these changes were followed by social changes — there are profound differences between the lifestyles of early and late capitalism.

Conclusion: when does an economic revolution start?

The conclusion to be drawn from the above remarks is as follows: every new means of transportation and communication changes the economy, and thus the society.

From the practical point of view, one should closely watch if a new means of transportation and communication is about to appear. When it does, mankind will face a new economic revolution, followed by a social one.

Internet as a new means of transportation and communication

Such a new form of transportation and communication has already appeared, and it is called the Internet. First built as a means of communication for a narrow social elite (i.e. scientists), then treated as a source of entertainment by young people, it is now becoming the most important tool of economy, both in terms of transportation and communication. When evaluating the Internet, one should not focus on its current weaknesses. Let us remember that Ford Model T, the first car manufactured on a mass scale, was nothing like today's Ferraris, and that for a long time England had a law stating that a person with a red flag should go in front of every car in order to warn other people about the danger. The Internet of today is only a prelude to the construction of a commonly accessible global multimedia and telecommunication network, an information highway, that will combine the features of the Internet, television, and mobile and stationary telephony.

In line with the integration of computer, cable TV, and telephone networks, the world will witness the integration of end-user terminals connected to these networks. Let us notice that because of the multitude of networks, people use various, separate devices: Internet-connected computers, TV sets connected to a cable TV and radio network, and telephones, faxes and answering machines connected to a telephone network. In the future, one can expect these devices to be replaced by a single terminal that will have all these functions. Obviously, such devices will come in various forms: mobile, stationary, home-use, office-use, car-use, etc. Simultaneously, computer-to-computer communication will develop rapidly. It should be remembered that computers will be incorporated in other devices, such as refrigerators, washing machines, TV sets, cameras, cars, not to mention industrial equipment.

With respect to the above understanding of network development, the basic questions are: if the Internet is the dominant means of transporting goods, then what will be the most important goods of the future economy? Similarly, if the Internet is the dominant means of communication, then what will be communicated? The answer to both questions is: **digital products** and **digital services**, understood as a special type of **digital information**.

Digital information

This report places a priority on information in a digital form, or digital information for short. Its fundamental feature is the universal, uniform carrier: a stream of bits, a series of zeroes and ones. Depending on the terminal used, such a stream of bits can be converted into any intelligible form — text, sound, or image, both still (graphics, photos) or moving (video, television). Such a stream of bits can also be converted into any form that can be understood by computers, that is, both software and data.

As compared to other, traditional forms, digital information has four unique qualities: **transformability**, **transmissibility**, **replicability**, and **indestructibility**.

Digital information can easily and automatically be transformed. In other words, it is easy and quick to process, both by computers and computer-assisted humans. It does not mean that other forms of information, e.g. a text written on paper, cannot be processed. The difference is that the time of processing such information, its costs, the necessity to use human work (even if processing is a routine), the number of possible mistakes, etc. are incomparably higher. In fact, with respect to more complicated information — for example a music record with many background noises — processing information stored in a non-digital form (e.g. on a vinyl record) is practically impossible.

Digital information can be easily, quickly and — if need be — automatically transmitted over computer and telecommunication networks. From the technical point of view, any digital information, can instantly be accessed from any point in the network world-wide.

Digital information can be extremely easily replicated. Moreover, the quality of copies is identical to that of the original version.

Digital information is indestructible. It does not mean that it cannot be deleted from a computer's memory. It means that it is not degradable: it will not be eaten by worms or attacked by fungi, or turn yellow.

Digital product

Digital information, when subject to business processes, becomes a **digital product**. From the point of view of their destination, one can differentiate four major groups of digital products:

- documents, that is information about facts or assumed obligations,
- money, that is information about financial instruments, such as cash, stock, bonds, etc.,
- copyright, that is literary and scientific works, publications, music and images, both still (photographs) and moving (films, recorded shows, documentaries),
- software.

In order to explain what a digital product is, let us consider what it can be made of.

First, it can be made of anything written: any book, magazine, memo, form (such as a tax declaration form or an invoice), register (e.g. a register of companies or patents).

Second, it can be made of any sound, both recorded and played (a song, a radio program), and performed live (e.g. a conversation).

Third, it can be made of any image, both still, that is photos, graphics, and moving, such as films, recorded shows, interviews, documentaries, sports events, conferences, debates, courses, etc.

Fourth, it can be made of any software, no matter what its kind is, i.e. firmware, software tools and software applications, including entertainment (computer games).

Finally, it can be made of multimedia, i.e. forms that combine all the above; in other words, software that communicates with people by means of text, sound, and picture.

Digital service

In the tangible world, the difference between a product and a service is absolutely clear. Everybody knows the difference between possessing a car, and polishing a car. In the world of digital information, the difference between products and services unexpectedly vanishes. One can realize that by asking a question whether information users want to own it or to have access to it. Do they want to "own" news, songs, movies, and programs, or rather to read news, listen to songs, watch movies and execute programs? Obviously, practical value comes from having access to information, and not from the fact of owning it. It is worth noting that from the technical standpoint the difference between a digital product and a digital service is next to none, because "owning a digital product" means loading a given file on one's own hard disk, whereas "providing digital service" means temporary access to the very same file. However, from the economic point of view the difference between digital products and services is important: services can be priced in proportion to its use, they give greater marketing opportunities (especially when one service is combined with others). Finally, a service allows for better protection of the rights of its author, producer, and seller against theft and/or abuse.

Digital products are inherently intangible, although they can be stored on a tangible carrier. For instance, a document can be printed on paper and software can be written on a CD-ROM. Similarly, digital services are intangible, which means that they can be provided remotely over the net. It is indeed unimportant whether the service provider is a human being or a computer. If one calls a hotline, then services are provided by humans, and if one watches a website, then the services are provided by a machine. Obviously, intangible digital services may have tangible counterparts provided directly by humans. If we receive an electronic demand to pay and execute a money transfer over the Internet, then we are dealing with intangible digital services. And if a debt collector comes over and demands cash, we are then talking about a tangible service.

Last but not least, let us mention various forms of payment for digital products and services, which do not change their nature, but are results of various business models. Let us stress that we do not talk about the purchase of copyright that allows for further economic exploitation of digital products and services, but about a fee for using them.

One can pay for digital products and services in the form of subscription and by obtaining a definite or indefinite license (e.g. subscription of a specialized information service for a definite period of time, or a license to use software for an indefinite period of time). It is possible for every use, e.g. watching a film on demand, or making a money transfer. Digital products and services can also be free of charge, because their costs are included in the costs of other products and services (an example of which are advertising and promotion products and services). Finally, digital products and services can be free of charge, when financed with public money, because they pertain to civil rights. This is an example of information products and services offered by public administration.

Electronic economy

Electronic economy is an economy where digital products and services are the means of conducting business. In other words, business processes are done over the net. In practice it means that:

1) official paper documents (agreements, contracts, invoices, etc.) and informal paper documents (memos, news, letters, etc.) are replaced with electronic documents which are exchanged over the net;

2) interpersonal interactions are done with the help of electronic media, thus replacing face-to-face meetings.

Informal paper documents are relaced by files that can be exchanged by email and/or direct transfer, or published on websites, in electronic newsletters, or news services. Another counterpart of such documents is an entry in a database, e.g. using an electronic form posted on a website.

Formal documents must be signed by an authorized person. The electronic economy uses the digital signature, which is a special kind of encryption. The purpose of such

encryption is not to conceal the content of the message, but rather to confirm that a given document comes from a given person, because only he/she was able to encrypt it in this way.

Today, interpersonal interactions by means of electronic media focus on text messages sent by email, which is, first of all, a result of the capacity of today's Internet. In the near future, high-quality video and voice contacts, i.e. videoconferences over the Internet, will be common. Today such conferences are done over telecommunication networks, which makes them expensive and creates a need for specialized equipment. In the more distant future, people will meet in virtual reality, which will cause even greater changes in the nature of interpersonal contacts.

It is worth stressing that interpersonal interactions by means of electronic media are not aimed at eliminating face-to-face meetings. They simply limit them to a certain extent in order to reduce costs, which is accompanied by a larger number of contacts. A fine example here is that of the telephone, which did not eliminate direct meetings — to the contrary, it has intensified interactions, some of which would not have otherwise been possible.

When defining the electronic economy, as one where business processes are done over the net, we want to stress that this notion applies to all sectors and businesses, no matter what they manufacture. An opposite type is the "paper economy", whereby everything depends on the flow of paper documents. By definition, the "paper economy" must be less efficient than the electronic economy, because paper documents are slower, more expensive, geographically limited and cannot be automatically processed. The issue of electronic economy will be discussed in detail in Section 3.1.

Sector of intangible products and services

In the electronic economy, it is necessary to distinguish a sector, where digital products and services play a two-fold role: not only are they a means of business-making, but they are also a commodity. This sector includes TMT (technology, media, telecommunications), publishing, and entertainment (as important providers of content), finances (because financial instruments are digital products), and widely understood education sector, including consulting (ranging from legal to medical).

It is worth emphasizing that, from the methodological point of view, identifying a separate sector of intangible products and services being a commodity, is more correct than just talking about the TMT sector, whose companies are quoted on USA's NASDAQ stock exchange. This sector is usually referred to as the *new economy*. Some even believe that we deal with a new economical science governed by different laws. In the culmination stage of the dot.com stock exchange boom, this conviction lead to quack-like valuations of the future value of companies who were still wet behind the ears in this new sector of economy. A correction of NASDAQ stock levels made it brutally clear that the economic laws are universal, and that the only unique characteristics of this sector are related to the features of digital products and services.

Regardless of the above remarks, it must be emphasized that the sector of intangible products and services is currently the most promising segment of the economy, because of its efficiency, profitability, productivity, and low market entry barriers. This sector will be characterized more precisely in Section 3.2.

2.3   Maciej Markowski
Social and economic development factors

This section contains an analysis of key factors in the development of the global information society and electronic economy, largely based on a report called "Creating a Development Dynamic" [www.accenture.com] prepared jointly by the UNDP, Accenture and the Markle Foundation. The report was drawn up on the basis of experiences gathered in countries of special importance to the UNDP, such as Brazil, Costa Rica, Estonia, India, Malaysia, South Africa, and Tanzania. These countries succeeded in the implementation of programs based on investments in IT and telecommunications that spurred further development in other areas.

Mechanism of development

The key issues that need strategic involvement are technical resources (computers and telecommunications), human resources (employees and consumers), law, business environment, and information resources (software and information) (see Figure 2.1). An improvement in any of these areas individually quickly brings positive effects. However, further improvement is no longer possible until limitations in other areas are removed. Therefore, a harmonious and coordinated development of all areas in question is crucial for a smooth transition into the global information society and electronic economy.

Fig. 2.1.
Key factors in developing the global information society and electronic economy

People
₁ High qualifica-
  tions
₁ Computer liter-
  acy
₁
  Entrepreneurshi
  p
₁ Creativity
Technical
resources
₁ High capacity
₁ Common
  accessibility

Strategic pact

Strategic pact
₁ Vision and
  leadership
₁ Strategic
  alliances
₁ Coordination
  of actions
₁ New forms of
  cooperation
Law
₁ Transparent
  and compre-
  hensible
₁ Consistent
₁ Predictable
₁ Protecting
  intellectual
  properties

Businesses
₁ Easy financing of
  new
  projects
₁ Pro-investment
  taxes
₁ Access to global
  and local markets
₁ Effective manage-
  ment
₁ Demand for prod-
  ucts and services

Information
resources
₁ Useful soft-
  ware
₁ Various forms
  of digital
  information
  content
₁ Native lan-
  guage
  usage
₁ Affordable
  price
₁ Openness –

Where to start? This question is bound to arise whenever one deals with such complex, multifaceted, and mutually-tied developmental issues. It seems reasonable to start with solving technical problems by saturating the economy with technical infrastructure (computers and communication devices). With this problem unsolved, it is either impossible to develop other areas (first of all, human resources and businesses), or motivation is too scarce (law and public administration). However, it is important not to limit the efforts to technical issues, since paradoxically it leads to a slow-down, or even stagnation of development.

A general framework of development looks as follows: significant initial outlays on IT and telecommunications lead to profitability of applying e-business solutions to companies and their mutual relations. These applications make enterprises change, which increases their competitiveness and enables their expansion into new markets. New ways of doing business call for new corporate, private, criminal and administrative laws that match the new challenges and conditions. More importantly, they also increase the demand for highly qualified labor, which involves investing in people. Investing in people — that is broadly understood education — results in the development of both individuals and societies. A more highly-developed society generates demand for new products and services, especially culture-intensive digital ones that make up the driving force of e-economy.

Technology

As mentioned above, increased data processing and transferring capacity is an indispensable condition of development. Moreover, this area conditions the progress of other factors influencing social and economic development. Technical development focuses on two targets: providing a suitable capacity of the telecommunications network (both within the country and world-wide) and securing a coverage of the entire country, so as to give equal opportunities to every community.

People

From the economic point of view, the very same person is an employee on the one hand, and a consumer on the other. Their education and qualification level defines the productivity and efficiency of the economy, and the size and depth of the market. Moreover, their education influences social organization and development.

The key skill will be computer literacy, or — strictly speaking — software literacy. It does not mean that software engineers will be the dominating profession of the future. It means that the software component will account for a significant portion of every profession, and this is why it must be an important element of every system of education. This brings to mind an analogy to the profession of a scribe. In the times when literacy was a unique skill, scribes were necessary to write down the words of the illiterate. When most members of a society became able to read and write, the profession as such disappeared and literacy came to be one of the basic skills used in all professions.

Therefore, the problem is to give people an ample amount of valuable knowledge and teach them how to use it in business. This knowledge capital includes all areas, especially culture-specific ones, because they will be an important competitive factor. The ability to carry out business incorporates two features: IT qualifications as a way to do business and entrepreneurial skills enabling an individual to compete globally.

Law

Well-made laws are of enormous importance for a country's development. Certain postulates regarding legal issues are self-evident. Law should be transparent, comprehensible and precise. Individual regulations should have a clear and consistent structure, legal changes should be predictable, law should not hamper business and should protect the society from abuse. However, the global information society and electronic economy pose

unknown challenges to law makers and theorists. How to synchronize the local reach of laws of individual countries with global business processes? How to find a compromise between an individual's right to privacy or a company's right to keep trade confidential and the obligation to protect the society from criminal acts, terrorism, economic frauds, etc.? How to solve the question of responsibility for computer-made decisions — who is to be held accountable for them: computer owners, software licensees, software manufacturers, software authors, or computer users? How to compromise between copyrights and authorship rights and people's right to information and culture? How can law protect the national culture?

Businesses

Economic development of every country largely depends on the conditions of doing business. The most important factors influencing businesses on their way to e-economy are presented below.

The foundation of a dynamic economic development is the accessibility of financing new projects. In other words, insufficient supply of cheap credits and problems with collecting investment capital limit development opportunities. One of the key issues in the electronic economy is venture capital. In countries like Poland, where economic potential is rather modest, small local venture funds have limited financing possibilities, and large ones do not enter the local market because they cannot find projects whose scale and profitability would be of any interest for them.

Intangible, digital products and services are of special importance in e-economy. Their ownership, i.e. intellectual property, is the very foundation of properly functioning electronic economy — if digital products are not legally protected, nobody will invest in them, and there can be no development without investments. Countries like Poland must overcome the legacy of the former system that made breaching intellectual property rights socially acceptable. There must be strong laws in this respect and they need to be strictly enforced and adhered to.

Low tariff barriers, both for exporters and importers, can significantly foster economic development because they allow for purchasing modern tools and technologies abroad and exporting domestic products and services.

An effective economy is possible due to computerized business and supply chain management.

Introducing e-business technologies to public administration and the entire public sector is a positive stimulus to businesses and plays a standardizing role.

Information resources

The term "information resources" includes both software and digitized information of various kinds.

The basic requirement with regard to software as well as to information is the use of native languages. A foreign language significantly limits the understanding and scope of application of information resources. For the sake of social needs and as a part of developmental policies it is important to support translation into Polish of foreign software interfaces, just as the world literary heritage, selected scientific publications and news items have been translated.

Constructing open systems that can be easily expanded, adapted and integrated with external systems significantly lowers costs and barriers of introducing e-business technologies to new areas of economy. This is why it is so important to develop national standards of software compatibility in public administration, as well as standards of publishing digital information.

High costs are one of the main factors that limit the availability of e-economy and its benefits, which is especially painful for smaller companies. Therefore, cost-cutting mechanisms must be worked out.

Strategic pact

The factors in economic development into electronic economy and social development into the global information society are so numerous, varied, and interrelated that they need to be coordinated on the strategic level. For the sake of smooth and possibly conflict-free development, it is advisable to make a strategic pact between key social partners, public institutions and private business. The aim of such a pact should be to hammer out a cohesive vision of development, division of roles, setting priorities and coordination of actions.

The analysis of the examples mentioned above shows that investments in IT and telecommunications done by developing countries can play a vital role in their national development strategies. In most cases, these countries focus on attaining one economic goal, such as increased export (Costa Rica and Taiwan), or gathering an economic potential (Brazil, India, and Korea). Some countries, however, such as Malaysia, Estonia, or South Africa, have decided to use IT and telecom investments to influence a wider scope of social and economic changes.

The Polish government has prepared several programs that can be a starting point for creating a complete strategy. To a considerable extent, the issues covered in these programs overlap with the questions mentioned herein. Still, it would be premature to discuss the implementation of these programs, not to mention their effects.

...upporting the processes of the information society formation must be a task for the entire nation. This is probably the last mission that can ignite passion in the younger generations of the Poles.

It is certain that the information society is being built, because this is the direction of development of the world Poland is increasingly integrating with. But if this process will be subject only to free market mechanisms, it will be chaotic and will benefit only the richest and best educated social groups. Other groups will be doomed to social exclusion and – which is the worst – to becoming a civilization handicap.

This is why no country in the world leaves the above process to its own devices. Next to market mechanisms, countries become active participants of this process. In such a liberal country as the USA, the logo of its information infrastructure includes the word "national" (National Information Infrastructure), because the key thing is to reach all citizens. Without such a role for the state, the public sector, indispensable in civil societies, would be eroded.

Poland needs a societal partnership that will enable cooperation of central, regional, and local authorities, NGOs, and the private sector in connection with technologies, information resources, laws, companies, and first and foremost its people. The most advanced information societies, such as the Nordic countries, have succeeded due to such partnerships, and also due

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Strategic
pact
in Poland

3.1   Andrzej J. Piotrowski

Electronic economy

Already in the 1960's, computer technologies were applied to certain areas of activity in large organizations. The 1980's saw the microprocessor, then the personal microcomputer and finally the network that gradually achieved a global reach. In the 90's, these achievements led to rapid changes in enterprise functioning, further reinforced by technical development that enabled quick and continuous upgrading of software and telecommunication products. Businesses made a long journey in a short time. From automated work on separate workstations (personal computer) to overall management of the entire company (networking of individual workstations within a single department) to unifying all business processes in the global telecommunication network. The driving force behind these changes is the fact that nearly everything around material production reduces to data transmission and processing. Moreover, various forms of data, or information, have come to be manufactured and sold.

In this section we demonstrate examples of changes stemming from new information and telecommunication technologies, and of their influence on business. For better visualization of the scale and importance of these changes, the main business processes are analyzed.

Characteristics of e-economy

The application of information and communication solutions in economy have changed the meaning of such qualities as value, distance, and time. The value of a product delivered to a consumer is less dependent on the value of materials used in its manufacturing. Most of this value is related to the knowledge necessary to manufacture and sell the product. The distance, or geographical constraints in general, is losing its influence on the shape of economic relations. As a result of developing electronic communication methods, global commerce ceased to be an exclusive domain of large multi-branch corporations. Due to the Internet, both researching distant markets and promoting one's products there has become cheaper and simpler. Electronic exchange of documents has decreased the difficulties related to negotiating and concluding contracts. In an increasing number of job types, the place of residence of an employee becomes unimportant. The use of the network cuts down the time consumed by various procedures, since documents and data can be exchanged almost instantly, independently of the physical distance between the parties.

If infrastructure and manufacturing power of competitors are comparable, economic success starts to depend on the time of reaction to market needs. The time of reaction depends on the company's knowledge about the market and its access to information. Time becomes also a factor influencing economic efficiency — accurate planning allows for limiting the amount of resources frozen in raw materials and unfinished goods, and exploiting the manufacturing power in a better way.

The new role of knowledge and information opens a new field in economy: a field of intangible goods consisting in digital information. New businesses appear to serve and manage this field.

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Types
of e-commerce

B2B	Business-to-Business
B2C	Business-to-Customer
C2C	Customer-to-Customer
	Intra-Business, including virtual enterprises

Depending on the country, 25% to 75% of business is related to public administration. Therefore, the letter "B" for "business" could also be replaced by the letter "A" for "administration". This gives the following:

A2B	Administration-to-Business
A2C	Administration-to-Customer
A2A	Administration-to-Administration
	Intra-Administration

The essence of e-economy is increased efficiency following the fact that a piece of information in a right form delivered to the right place in the right time enables making optimal decisions. Optimal decisions allow for attaining the lowest costs, while preserving requested quality, or allow for exploitation of market potential to increase the sales volume. In a certain time perspective, both these factors lead to profit maximization.

Efficiency of e-economy mechanisms described below is strictly related to network accessibility. Mathematically speaking, the possibility of making the demanded number of contacts is a square function of the share of natural and legal persons with network access within the entire population. Therefore, if 7 out of 10 members of a given group have access to the network, it is feasible to make 50% of all theoretically possible contacts. If the network accessibility is too limited, the efficiency of network solutions might turn out to be much lower than expected. This strict relation between efficiency of e-economy and network development level is a direct reason why state administration should actively assist the creation of favorable conditions for ubiquitous network accessibility.

Promotion and advertising

The Internet, as a medium of information transmission, is an extremely effective promotion and advertising tool. Next to quite new forms of advertising, it offers modified versions of traditional ways of expression, such as posts or mailing. In most cases, the preparation and publishing costs of Internet advertising are significantly lower; moreover, it makes it easier to reach the right audience on any market. In the case of passive forms, such as advertising texts posted on web pages, a quick reaction to changed circumstances is not a problem at all. Advertising banners posted on personalized web pages are automatically and dynamically selected, in keeping with the interests of a given user. For example, if the user shows interest in garden plants, then the pages displayed on his/her screen will include advertising materials related to various gardening products; similarly, users interested in pets will see banners related to products for cats and dogs.

A major advantage of Internet advertising are banners including links to URLs where the user can find additional information on a given product, or even buy this product online. In case of press or TV advertising, the impulse spurred by an ad or commercial hardly ever translates into an active reaction, and the advertising effect can only be achieved by means of repeated posting. The Internet is free from this obstacle and if a user is interested in a given product, he/she usually goes to the target URL after seeing the first ad.

In electronic economy, information and advertising brochures and leaflets take the form of websites. Consequently, information becomes available 24 hours a day and can be regularly updated and accompanied by search engines. In contrast to paper publications, web-

sites may contain animated graphics, and audio and video clips. If these tools are effectively applied, a website can successfully replace a company representative. Some offers addressed to users with high-performance equipment make it possible to initiate a phone call or even a video conference with a company employee responsible for a given issue. Other users can take advantage of e-mail communication and of chatrooms where many users ask real-time questions and receive real-time answers over the net.

The development of the Internet has led to completely new promotion tools, unknown in traditional economy. Advertising materials can be included in private e-mail (in return for free mailbox management) or displayed as banners on private web pages (in return for free hosting). The source code of web pages can include a set of keywords; therefore users of popular search engines can access a given web page more easily.

Another example is so-called avalanche (or virus) mail advertising. In this type of advertising a user receives a potentially interesting piece of information by e-mail. This information is considered valuable either because its content is attractive or it provides an opportunity of a gain (e.g. a prize). The user is expected to distribute this piece of information to his/her friends. If this mechanism is skillfully applied, the number of information addressees grows dramatically. This method has been used by one of the newest online banks in the USA. Having considered the per user costs of a traditional promotional campaign, the bank's managers decided to pay half of this sum to every person who opens an account with the bank. The information about this decision was distributed by e-mail and contained a suggestion to forward the message to one's friends. On a seminar organized by the American Bankers Association, almost every participant admitted that the new bank had taken over at least several customers of his/her branch.

Marketing and market research

A way to succeed in virtually any business sector leads through good recognition of customers' needs and identifying those characteristics of a product that influence the decision to buy it. Electronic technologies have brought about a wide array of new tools for the cheap and quick collection of necessary information. Moreover, the Internet offers many unconventional methods of market researching and identifying customers' preferences. The capability of predicting external factors that influence customer behavior constitutes an ever-growing part of market knowledge.

A new mechanism for collecting information about customers and their reactions are personalized websites. Users visiting some online stores and vortals can decide to register. As a result of registration, the host server recognizes individual users and dynamically chooses the set of presented information. The choices are made on the basis of data provided during registration and collected from monitoring the materials viewed by the user. Aggregate data concerning user behavior and reactions constitute a basis for market analyses.

Information about customer needs and preferences can also be taken from discussion lists. Such lists are sometimes initiated by providers of certain goods or services in order to facilitate the exchange of customer opinions and experience. There are also many thematic lists owned by non-commercial organizations. The issues discussed by list members are often an important hint in building market strategies. The Internet, as an unconstrained

1. Sales of intangible products and/or services (information)
2. Margin on the sales of intangible products and/or services
3. Margin on the sales of tangible products and/or services
4. Sales of advertising and other forms of promotion
5. Subscription
6. Transaction fees
7. Share in revenue from telecommunication fees
8. License fees
9. Advertising and/or information barter

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Advantages of e-business

Electronic business, or to be more precise – business processes performed via the net – has four basic advantages:

Time
The time of completing a business process is shortened dramatically. It is enough to compare the time necessary to send a paper letter by traditional mail to the time of sending an e-mail message. In more general terms, accessing business information via the net is highly time-efficient, which translates directly into increased management efficiency. Moreover, business information is available 24 hours a day and 7 days a week.

Costs
Similarly, the costs related to business processes are much lower. For instance, it is estimated that a bank transaction carried out at a checkout in a bank costs ca. $1.5, whereas the same transaction done via the Internet costs around $0.04.

Geography
Business processes are becoming independent from geographical distances. There is no difference between sending an e-mail message to another room or to another continent.

Automatic reaction
Due to identification (at least partial) of the communication partner, it is possible to automatically personalize the business proc- ess by retrieving his/her profile, or the profile of his/her market segment, or the history of

forum allows one to find many more authentic opinions than those found in traditional surveys. Due to special mechanisms used to locate specific information, it is possible to analyze features of numerous groups of customers at costs significantly lower than those incurred by traditional methods. In Poland, this method is used by online banks, such as mBank and Inteligo.

The Internet as a commonly-accessible medium allows for browsing competitive offers of the same product or service without any geographical constraints. Works are underway to build specialized software that would automatically find the most attractive offers of a given product. This will have twoeffects: firstly, customers will have a much richer set of offers to choose from; secondly, competitors will see each other's prices and can dynamically adapt their own offers. As a result, the new market will be more competitive, will change more often and factors other than price will come to be decisive. In the face of increased competition, prices will become flat, and the decision to purchase a product will be made on the basis of its cultural features, delivery conditions and the seller's reliability.

Negotiating and concluding contracts

Electronic communication begins to supersede traditional forms of negotiating and concluding contracts. In its simplest form, bilateral negotiations of contractual terms are carried out by means of exchanging electronic letters, often encrypted so that generally accessible Internet e-mail can be used. Until recently this type of negotiating was concluded by exchanging paper versions of agreed documents either for evidence (*ad probationem*) or because a written form was legally required (*ad validiatem*), or for the sake of achieving additional legal effects (*ad eventum*). Currently, a growing number of countries including Poland have introduced changes to their legal systems that sanction the equality of electronic and written documents with respect to all above-mentioned cases as long as certain criteria (such as third-party authorization) are met.

Posting messages on websites becomes a typical form of announcing public tenders. This is the method used to publish information about R&D projects financed by the EU. Limited tenders, in turn, more and more often take place on specialized Internet markets. One can find there both large scale projects carried out by big corporations (e.g. automotive industry) as well as smaller ones carried out by independent companies. With respect to standardized goods, electronic markets become a kind of exchange that allows sellers

and buyers to conclude transactions at optimal prices. Websites offering auctions of various, usually second-hand products are also growing in popularity.

It is also worth noticing the emergence of e-markets specialized in barter trade. The manager of such a website introduces a token currency that allows its users to arrange multilateral barter transactions that would be extremely difficult and time-consuming otherwise. This type of service is useful for getting rid of surplus amounts of goods, especially in saturated markets and in the face of decreased demand.

At present, intensive research is carried out to automate negotiation processes. This research includes both human-to-agent negotiations as well as negotiations between two software agents acting on behalf and in the name of their owners.

Post-sale services

Competent and well-organized customer service is not only an excellent opportunity to build a company's prestige, but it is also an additional source of income. It can come either from selling new products to the same customer or from supplying accessories, maintenance services, etc. Depending on the type of goods and customers, various solutions of different technical levels are applied in this respect. The simplest solution is a telephone hotline; when the number of standard calls rises, such a hotline can be equipped with a com-

The theory of logistics defines the supply chain as a sequence of processes resulting in manufacturing an end-product to be purchased by a consumer. Therefore, the supply chain includes a wide group of processes, from collection of raw materials, to transportation, production, distribution, warehousing, marketing and, finally, to sales.

First computer systems devoted to support production were developed in the 1960's. They allowed for stock inventory supervision. The 1970's saw the creation of systems for Material Requirement Planning or MRP. These systems allowed the producer to supervise the flow of raw materials, components and half-finished commodities, thus enabling early planning of inventories.

In the beginning of the 1990's, MRP systems evolved into Enterprise Resource Planning (ERP) systems, responsible for overall management of all business processes within an organization. The core of an ERP system is an integrated database that stores information describing all aspects of the company business. An ERP system is composed of modules responsible for processing data of particular kind and for their overall analysis. Typical ERP modules are finances, purchases, production planning, inventory management, controlling, human resources management, etc.

The development of business support systems had led to optimization of internal business processes. Further improvement of enterprise functioning was possible only by means of total optimization of the entire supply chain. Electronic supply chains became an urgent need. The idea of such chains was not new. The first steps in this direction were taken in the 1970's, when the Electronic Data Interchange (EDI) standard was developed. Today it is quite clear that the EDI standard marked the beginning of important changes in supply chain management, since it radically shortened the time of sending and accepting orders. Unfortunately, it has always had but one major disadvantage: its implementation is very expensive, which renders it available only for big companies.

It is the Internet that allows for mass application of electronic supply chains including both big and small organizations. Electronic supply chains allowed for separation of information and document exchange from deliveries of goods or services. As a consequence, it is becoming possible to do away with the concept of fixed supply chains and suppliers. Electronic exchanges and reverse auctions have become a natural form of configuring electronic supply chains. At an exchange, manufacturers present their products and negotiate sales conditions with customers; at a reverse auction, customers post notices about demand for certain goods or services and negotiate purchase conditions with suppliers. The open charac-

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Electronic supply chains

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Cooperation
between
companies

Two types of enterprises are beginning to dominate today's economy: integration companies and specialized companies, while intermediate types of enterprises are slowly reducing. Integration companies strive to attain a global position. Their name and brands are recognized all over the world. The main operational objective of an integration company is to arrange cooperation and trade exchange between specialized companies dispersed around the world in order to manufacture and sell goods under its own name. The main strategic task is to plan and ensure development, which frequently influences the entire sector of industry.

Specialized enterprises have know-how and advanced technologies in a certain narrow area. They can pursue any kind of activity: manufacturing, services, design, consulting, etc. They employ experts, they are efficient and flexible, and can respond quickly to market changes. They know the local market very well. They also initiate scientific and technical progress.

In an electronic economy, the cooperation between integration and specialized companies is possible due to electronic exchanges (see the box "Electronic Supply Chains"), frequently operated by a global integration company.

As the progress continues, electronic exchanges will evolve from a place of buy and sell towards a universal platform of cooperation of specialized companies serving global integration enterprises. Such cooperation is indispensable, because various companies from different areas and different countries have to cooperate in joint projects. One of the forms of such cooperation will be teleworking by means of purpose-made assisting software, currently at the stage of intensive research and development.

Poland must face two questions. First, is Poland able to successfully promote at least a handful of its companies on the global level? Let us realize that even such small countries as Finland

Fig. 3.1. Cooperation of specialized Small and Medium size Enterprises (SMEs) through an electronic cooperation platform to serve a global integration enterprise
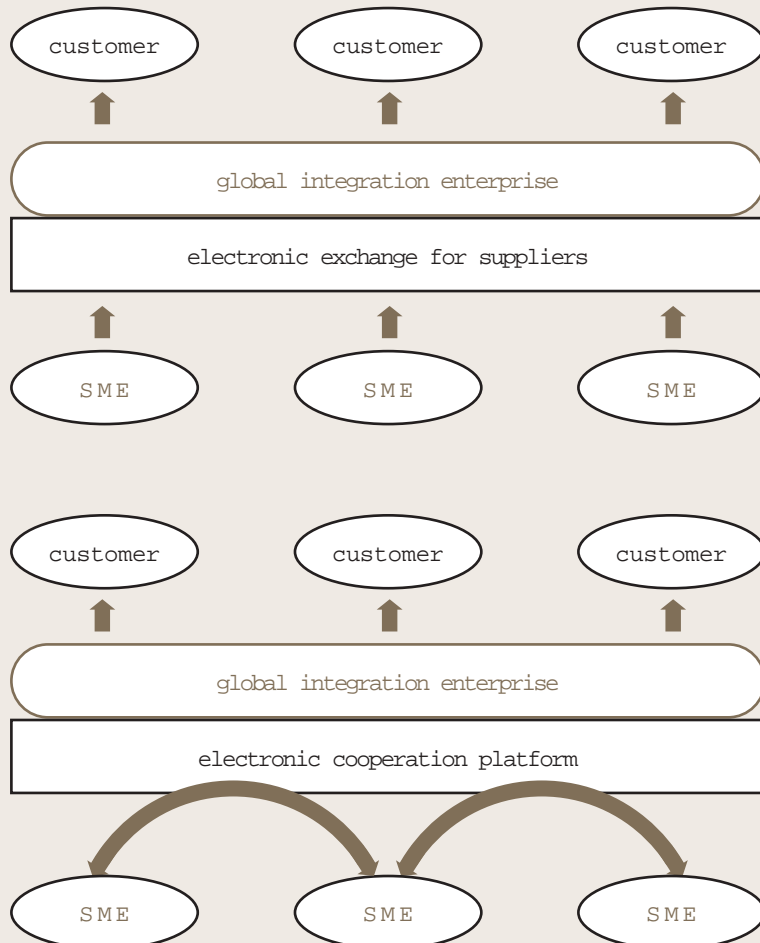
puterized message generation system. In more complex cases, customer relationship management systems are applied: they are responsible for registering calls, deadlines, cases, procedures, responsible employees, etc. As a result, any employee who takes a call can give competent answers to inquiries about an existing case or identify and initiate the right procedure. These systems are often further expanded by Internet communication mechanisms. Using a website, a customer can find additional information, use email, or contact an assistant. Additionally, such a system can offer voice contact with an employee of the suitable department. Solutions that allow customers to monitor the current status of a given assignment, e.g. a shipment or order delivery are also quite common. In the most advanced applications, post-sale services are rendered as telework. This field has been pioneered by CISCO, the world's leader in router technologies.

Administration services

Management and administration of back-office work has been greatly simplified since Internet-like solutions were applied to internal networks within organizations. These so-called **intranets** have simplified managing employees' issues, provided better access to data from various fields of company business, allowed the use of electronic data sheets instead of paper ones, etc. Intranets can also be accessed by employees who are away and use modem-equipped computers. A similar solution is to use the Internet to connect separate branches of the same company. Such an isolated company network working on the basis of the public network is called **extranet**. Due to the Internet, internal communication within an organization can be truly versatile, it helps overcome time-zone differences and is much cheaper than telephones or paper letters. It also leads to simplification of administrative procedures in multi-branch enterprises: independent from geographically scattered manufacturing and distribution structure of a company, its administration can be centralized, taking advantage of telework, which results in decreased costs.

et us take an example of a world leader in modern technologies with a presence in over 130 countries and an annual turnover exceeding USD 30 billion.

Until recently, every question, especially not a standard one, concerning the current state of business (e.g. a question about monthly sales volume of a given product worldwide), caused an avalanche of phone calls and fax messages sent between the headquarters and local branches, and numerous employees needed days or even weeks to aggregate and verify the data.

Today, the answers to such questions are available instantly, 24/7, no matter if the person asking a question is connected to the internal network of the company on its premises, or in a hotel room, or at home. It is possible due to an automated business information system that is installed on computers of all sales representatives, their bosses and administrations. For those people, this system constitutes the basic tool of everyday work.

All information about concluded and potential contracts is available in real time to all authorized personnel.

The system is used not only for generating reports for top-level management, but it also allows for instant information exchange with colleagues working on the same projects, independent of their current location and their position in the company hierarchy. Therefore, such a system makes a very effective tool for remote collaborative work.

A part of the system is a personalized portal installed for every user. Such a portal allows information to be displayed in the most convenient form. It takes advantage of an intelligent, personalized search engine, displays the latest news provided by internal and external services, news of pre-defined topics, as well as information selected automatically by the system on the basis of user interests, inferred from his/her previous queries. The system makes it possible to check whether another employee of the company is or was handling a similar

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Glifski

Business
information
system
in an international
corporation

Wojciech
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Innovation
and
globalization

The globally-reaching electronic economy is characterized by extremely high competition, which results in lower prices of goods and services. Consequently, the market is being re-oriented from the producers ("push market") to the consumers ("pull market"). Until recently, customers were doomed to accept the conditions and methods of trade offered by producers. At present, opinions and requirements of the customers determine the way producers and service providers operate. Customers require novelties. Therefore, mainly innovations provide producers with competitive advantages, because a producer may demand higher prices for its products or services only in the case of a novelty. This is why research and development capabilities determine the competitiveness of any economy.

The very name indicates that novelty is short-lived. Consequently, the share of R&D cost within the total cost of a product or a service grows. Since this surplus cost cannot be covered by extended lifetime of a product or a service, it must be paid for by market expansion, consisting in a shift from a

Financial services

In a growing number of cases, financial and accountancy systems used by companies are adapted for direct cooperation with a bank's system. This allows for automation of such routine tasks as transfer orders, currency option purchases, registration of paid receivables and balance coordination. Due to the elimination of delays in registering financial events, companies are capable of better management of their financial resources and can allocate surplus sums for bank deposits or other financial products Advanced e-banking systems allow for multi-channel access to banking services. While business accountancy systems use direct connections, company managers will find it more convenient to use the Internet or WAP-capable mobile phones. In the face of an increasing array of products offered by the financial sector, the importance of electronic communication is growing. Electronic exchanges of accounts receivable can significantly improve market liquidity. Internet payment systems are an extremely helpful solution for companies receiving large numbers of payments (two such systems, Bill Bird and PayBill, are used in Poland). The payers take advantage of electronic display of invoices and the possibility to pay them online, and the receivers avoid the hassle related to payment identification, since all information is sent in accordance with the accountancy system requirements.

3.2 Maciej Markowski
Economic sector of intangible products and services

Information and communication technologies significantly influence all sectors of the economy, because they change numerous business processes within enterprises. Still, in most cases the end-products must be delivered to the customer in the traditional way. It is not so, however, when it comes to several sectors offering intangible products and services that can be delivered over the net. These are the following:
1) IT sector (software),
2) media sector (information, publications, entertainment),
3) financial sector (banking, capital, insurance, taxes, etc.),
4) knowledge sector (education, consulting services in economy, law, medicine, etc).

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At present, these sectors are the fastest growing branches of the economy and are capable of generating the highest return on investments. Moreover, they are open to new businesses. In some of them, starting a business does not demand huge financial resources, because part of the initial capital may be replaced by knowledge. It is enough to compare the efforts necessary to start a new power plant to those related to starting a new software or consulting company. Another important thing from the economic point of view is the fact that these sectors increase demand and open a large market for information and communication tools and technologies.

In the history of retail trade, no innovation has fully dominated the earlier methods of distribution. Be it street markets, shops, commercial downtown areas and large shopping centers on city outskirts: all these forms have survived, although their roles have changed throughout the centuries. For example, catalogue sales in the USA had been growing at a rate of 25 percent per annum at the end of the 19th century, but at present it accounts for no more than 10 percent of the total sales volume.

One of the first enthusiasts of applying the Internet to make business were people from the **IT sector**. They made the first attempts at using the opportunities provided by the net for better organization of manufacturing processes. For instance, software development of distributed software led to the creation of global organizations capable of working 24 hours a day without forcing the employees to work on night shifts. This effect was achieved due to using time zone differences: at the end of the day, employees of a US-based unit used to send the effects of their work to another time zone, e.g. to Asia, where the work continued, also in the daytime.

In the IT sector, many mechanisms and methods previously used within organizations in local area networks could be applied almost unchanged to the Internet, and be used for better cooperation between companies and their clients (both businesses and individual customers). We mean first of all remote upgrading and configuration of software. However, as a consequence, it is possible to remotely manage all computer-operated installations. The best example is remote management of so-called "intelligent buildings" that is facilities where the whole technical infrastructure is operated by an integrated computer system.

The **media sector** was, quite obviously, the first beneficiary of the Internet, although only a few companies achieved financial success in this way. The business model based on providing free web services and relying on income from advertising appears to be efficient only in several cases worldwide. It may soon turn out that only a very limited number of companies using this business model are able to survive. The example of Napster showed, however, that there is a global market for digitized music exchanged through the net. At present, this way of selling music grows by 80 percent a year, that is faster than the number of Internet users, and will account for at least 10 percent of global sales volume in 2002.

The most promising business model is that of paid services offered over the net, although many see it as contradictory to the original idea of the Internet. Nonetheless, one can assume that these types of services will grow only when convergence processes are more advanced (see the Convergence box) and when there are more multimedia of better quality available on the net.

New information and communication technologies provide new ways of interaction, listening or watching news, reading, shopping, watching movies and TV, playing games and taking photos. These are the activities that absorb most of people's free time — in the USA, for example, an average person spends 40 percent of his/her time on the above activities. It is quite possible that in the near future, due to technological advancements, most of these activities will be carried out over the new generation Internet, thus causing major changes in customers' spending patterns.

In the early days of applying the Internet to the **financial sector**, brokerage houses developed much more quickly than retail banks. This was a result of the greater importance of time to stock exchange operations, as compared to banking. Moreover, a group of independent stock exchange investors is much more prone to take risks in order to make profits, and therefore to use modern, barely verified tools. For the sake of truth, let us add that many Internet stock exchange systems are safer than bank accounts, because in the case of the former no money can be actually stolen. However, with the end of the boom many

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Business models in the Internet

It is a common belief that electronic business consists in simple buy/sell transactions made over the net. This is a fairly simplified view that does not fully reflect the reality. In this section we present a number of Internet business models.

Brokerage model
Brokers arrange meetings of sellers and buyers, and make it possible to conclude a transaction.

Advertising model
The advertising model is based on offering various, usually free services (such as email accounts) and/or products (e.g. computer games) in exchange for presenting the customer with advertising materials.

Infomediary model
The infomediary model consists in offering usually free services (e.g. Internet access) and/or products (e.g. computers) for information about the user's interests and behavior in the Internet. This model can also function in a reverse way, when it is involved in providing customers with information about mutually competitive products and services.

Merchant model
A typical merchant (retailer or wholesaler) of tangible or digital products and/or services, sold on auctions or on the basis of price lists.

Manufacturer model
In this model, the manufacturer of certain products uses the Internet to contact the largest possible number of final customers, thus avoiding wholesalers and retailers.

Affiliate model
In the affiliate model, banners providing links to a trader site are located on sites of many companies affiliated with the trader. The affiliated companies receive a share of the profit on sales initiated on their own sites.

Community model
The community model is based on customer loyalty instead of intensive traffic. Customers who have invested a lot of time, and possibly money, in developing the community's website will regularly contribute to its development.

Subscription model
In the subscription model, a customer needs to pay for accessing the content. This model may combine less attractive, but free content, with more attractive (e.g. updated) content available upon subscription.

investors lost their interest in stock exchanges and the development of this market has been stopped.

Electronic banking is the best example of the inevitability of business applications utilizing Internet tools. In Poland, within less than a year after the first fully functional solutions were launched, e-banking has won thousands of customers. Since some customers go to a bank branch not to make a financial transaction, but rather, for the contact with other people, e-banking will never fully overtake traditional banking, but in the course of time it will surely become the dominant way of customer service.

The development of electronic banking is currently going through the optimal stage. Not only do its users come from the upper segment of customer base, but the costs of winning new clients have also been lowered and the geographical range of services has been extended into new areas and societies. Therefore banks can reduce their investments in physical infrastructure and staff (most notably in distribution), and take advantage of the economies of scale. The exploitation of a new type of "intermediary", i.e., web sites, allows for intercepting new profitable niche markets and customers.

Many e-banks have been formed from scratch and are therefore free from calcified and overgrown management systems; their internal business processes are modern and efficient. They apply new management methods and usually take advantage of outsourcing, which allows for better application of funds. Unfortunately, the golden era soon will be, or already is, over. The competition is high and the number of customers does not grow fast enough. Due to a relatively low entry level, new competitors, such as financial institutions that needed more time to become visible on the market, are beginning to appear. However, it is not solely the competition that leads to lower profitability; another reason is

that customers have better access to information about prices, which results in lower margins. Simultaneously, attractive online offers lead to lower prices in traditional distribution channels. Despite lower prices customers begin to see traditional banks as more expensive. In addition, the costs of ensuring integrity of traditional and electronic distribution channels, as well as providing customers with similar operation modes in both channels are fairly high.

In the sector of corporate clients, banks are forced to redefine their role, since the supply chain between the sellers and buyers (i.e. banks and banks' customers) is changing and as new competitors arrive on the scene. In this area, e-banking can be an extension of the current ties between banks and their customers. Some banks help their customers to manage financial liquidity. Due to extensive know-how and experience in data processing and management, banks can generate additional revenues by offering a wide array of back-office services. Examples of these are: full payroll management, accountancy and financial management, data storage, human resources administration, CRM, etc.

Unfortunately, Polish banks did not use their privileged position on the market of money transfers and have not become electronic B2B brokers.

One can expect that the sector who will take interest in e-business in Poland will be insurance companies. So far they had not shown interest because digital signatures were not legally recognized. The adoption of the necessary legal solution makes it possible to conclude insurance agreements over the Internet.

The most sublime Internet application is observed in the **knowledge sector**, including education (described in Chapter 7), and widely understood **consulting** in nearly all areas, ranging from taxes to health care. In these fields, human-to-human communication plays a

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The critical issue of e-banking is to gain online customers, make them stay and preserve profitability.

Positioning of the offer
Launching a separate e-bank with a new brand or launching an online version of an existing bank? Establishing an online store with the complete range of financial services or narrowing the offer down to a handful of products?

Price strategy and profitability
What a competitive factor should be: lower prices or higher comfort or product range? Many banks look for alternative sources of income, such as offering third-party products on its own web site, combined sales of more profitable products, offering marketing data on customers to third parties.

Channel integration
How to achieve uniform customer experience, independent of the channel they use (traditional branch, telephone, Internet, interactive television, etc.)?

Customer relationship managemen
How to improve customer service? This is an important factor of provided values, because when prices become flat as a result of their transparency, customers start looking for flexibility, comfort, personalized products and perfect service.

Avoiding routine
With flattening prices of banking serv-ices, the basic products offered by e-banks become more and more standardized. Banks react in various ways: focusing on the more valuable customers; offering new products of higher margins, such as investment funds; acting as shopping portals with links to vendors.

Third-party brand sales
Larger banks can increase their revenues by offering cheaper back-office capacities to pure e-banks, thus becoming large transaction processing centers.

Cost reduction
How to use new technologies and the Internet for cost reduction? Whether or not to reduce the number of branches, risking unfavorable opinions of the press and customers?

Middle-term strategy
of competing against bank-like offers

Maciej
Markowski

Decision
criteria
of e-banks

Bartosz
Strycharczyk

E-banking
in Poland

Homebanking

Homebanking defined as a remote access to a bank account through a modem by means of a special home-installed software, is currently offered by 25 Polish banks. The number of homebanking users amounts to ca. 75 thousand.

Internet banking

Internet banking services are available at 15 commercial banks and 7 cooperative banks. The dynamic growth in Internet banking has been observed since 2000. As of January 2002, about 680 thousand commercial bank accounts were being operated through the Internet. The total number of customers exceeds 625 thousand. Available options include: wire transfers (standing orders and single transactions) including social security premium payments, opening and closing deposits, direct debit, ordering and canceling checks, ordering and canceling debit cards, PIN changing, deleting future transactions, deleting or correcting certain orders prior to their finalization, canceling documents, browsing the balance and history of the account and orders.

Debit cards, automated teller machines, and POS terminals

As of December 31, 2001, 14 214 490 bank cards, including 451 262 cards accepted by automated teller machines have been issued in Poland. Domestic debit cards numbering 112 695, account for 1.25% of all cards, of which, 82% are for electronic use only. The leading card issuers in Poland have been VISA and Europay. The number of retail outlets accepting debit cards exceeded 120 000 in August 2001. The number of automated teller machines as of December 31, 2001 was 6 442, out of which 6 393 accepted VISA cards, and 6 155 accepted EuroCards/MasterCards.

Telephone access to bank accounts

Such services are available at 18 banks. Some of them offer only the option of checking the balance and recent transactions. Others offer an active access, including, for example, making wire transfers and opening deposits.

WAP/SMS access to bank accounts

Currently, accessing a bank account, both passively and actively, by means of a WAP mobile phone is possible at five banks. SMS service is available at 10 banks, but only 2 of them offer active options. All these banks offer Internet services as well.

crucial role, so application of new technologies usually calls for breaking many barriers, not necessarily technological ones. Consulting by means of new technologies involves totally new ways of behavior of both consultants and their addressees. For instance, consultants must learn how to talk to a camera, and listeners must show greater self-discipline and attention. It seems probable that remote consulting by means of state-of-the-art IT and communication technologies will spend a long time looking for the optimal forms of interaction, corresponding to a different quality of the used media.

3.3 Józef Lubacz
Development of information infrastructure

The information infrastructure of an information society is defined by its telecommunications, information technology and electronic media. Trivial as it seems today, this statement would have been incomprehensible a few years ago. That does not mean, however, that its current understanding is correct – quite to the contrary, numerous simplifications, misunderstandings and unfortunate interpretations have appeared. What follows is a set of brief remarks referring to some of them. These remarks constitute an introduction to some conclusions presented thereafter.

Even the simplest forms of social organizations can include some aspect of what is currently referred to as the information infrastructure. Therefore, it is not a contemporary invention. The importance of this statement stems from the fact that it reflects the broad meaning of the term. Limiting this meaning to modern resources of information technology, telecommunications and electronic media is an unjustified and harmful narrowing.

The term **infrastructure** is all to often used solely in reference to technical resources, which is yet another ungrounded, and unnecessary limitation. The dictionary definition says that infrastructure includes technical and institutional resources used for providing a society with services which assist the functioning of various aspects of societal existence. In accordance with this definition, an analysis of information infrastructure must refer not only to technical structures, but also to institutions (including regulating bodies) and to the services they render.

Well over one hundred years ago, telecommunication infrastructure was an important element of the information infrastructure of societies. It is worth stressing that a short time ago the International Telecommunications Union (ITU) celebrated its 135th anniversary. The primary goal of ITU has always been to promote the use of telecommunications worldwide, or – using current terminology – to promote the globalization of information infrastructure.

Contrary to quite common opinions, ITU's role in telecommunication infrastructure globalization has not diminished. Such opinions are based on a conviction that advancing liberalization and deregulation of the telecommunication industry as well as common Internet access has abolished the need of normalization introduced *de iure*, which is to be replaced by normalization done *de facto*, as a result of market mechanisms. So far, hardly anything confirms such a conviction. Indeed, *de facto* normalization has gathered momentum as a result of liberalization and deregulation, but it has also accelerated the process of *de iure* normalization, instead of causing its disappearance. Last but not least, it is worth pointing out, that when ITU was established to take advantage of *de iure* normalization, the global economy was much more liberal than today.

The growing deregulation and liberalization of the telecom industry is often seen as a triumph over the dark period in the history of this sector. It is generally believed that we are about to reach "the end of the telecommunication history", to paraphrase Fukuyama. This is a very simplified view. The historically shaped form of institutionalized and regulated telecommunication sector is a result of an informed choice, by virtue of that telecommunication was recognized for its common value, such as postal services or electric power distribution. As a consequence, it was decided that offering telecommunication services would be done on the basis of so-called natural monopoly, excluded from direct influence of free market mechanisms. The next step was the formation of monopoly enterprises (state-owned in Europe and private in the USA), subject to meticulous state regulation, the purpose of which was to curb negative effects of monopolistic systems (the efficacy of such regulations was rather low, however). In spite of its disadvantages, the monopoly ensured common access to high quality telecommunication services (except for a few pathological examples). One can argue, whether comparable or better effects would have been

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Convergence

The process of convergence consists in gradual unification of three vast areas: information technologies, telecommunications, and media. At the very foundation of convergence lies digital technology that allows representation of all signals, be it electrical, optical, or radio in the form of binary digits. As a consequence, information processing and transmission is now reduced to processing and transmission of bits, carried out by means of unified technologies: a modern telephone exchange is a specialized computer with dedicated software, instead of a special electro-mechanical device. In simple terms one can say that if a stream of bits is sent to a user over an electric wire, optical fiber, or through radio waves, then the user's terminal decides whether this stream will be converted into a voice, an image, a text, or computer data. Obviously, such voice, image, text or data must be meaningful; therefore media responsible for the information contents are the third part-

ner in the convergence process.

Convergence is not only about technical issues. It has also an economic dimension (mergers of companies belonging to sectors recently considered separate) and a legal dimension, since the laws regarding the three areas show wide discrepancies, resulting from different conditions in which these laws developed. Therefore, we are currently witnessing numerous partial convergences: convergence of telecommunications and computer networks, of stationary and mobile telecommunications, of computer and communication hardware and software, of television and computers, of television and telephony, and finally of information technologies and information contents.

An utmost aim of convergence is to reach a level where everybody, independently of geographical location, can use a single device for obtaining (or buying) any information or communication service. Simply speaking, a level where it is enough to click one button

achieved if the telecom sector had always been subject to free market principles. It is difficult to answer this question from today's perspective, because the situation of the early days of telecommunication was in many ways different than now. It is not unreasonable, however, to bear in mind that the historical form of institutionalized and regulated telecommunication was abandoned a relatively short time ago, when its main purpose was achieved in the most advanced countries and its further preservation had become a braking force in developing more complex and varied telecommunication services.

Contrary to telecommunications, the development of IT infrastructure has always been a result of market mechanisms, free from any special regulations. This difference stems from the fact that in the first stage of IT development, computer technologies were used mostly locally, and nearly always for professional purposes. As a matter of consequence, no computer service has come to be recognized as a common value, as was the case with telephony. There were therefore no reasons for *de iure* standardization, state regulation, or considering the natural monopoly model.

Due to historical reasons, the differences between IT and telecommunication infrastructures were by no means small. By the 1970's they had turned out to be an obstacle in the development of both infrastructures, which initiated efforts aimed at integrating technical solutions and services used and offered by both. This was the beginning of the convergence process, whereby institutional, regulatory, service-related, and technical aspects of telecommunication and IT were being made uniform. This process gradually comes to include electronic media, the development of which has become in many ways analogous to that of IT and telecommunication industries. For the sake of clarity it needs to be emphasized that the sector of hardware for telecommunication and electronic media has never been subject to such regulations as those which were applied to services rendered by these infrastructures. On the other hand, there is a significant degree of specialization among hardware manufacturers, who target different market sectors: telecommunication, IT and electronic media. It must be stressed that the above remarks concern primarily the public infrastructure. Internal infrastructures within companies have grown mainly as a result of market forces, and administrative actions were of minor importance. Therefore the integration and convergence of telecommunications with IT has always advanced more quick-

ly in the business sector, as it does not follow the mission of service promotion and its con-comitant burden.

The circumstances described above refer mostly to the historical features of the process that has shaped the modern face of information infrastructure components, i.e. telecom-munications, IT and electronic media. Considering these circumstances makes it easier to properly diagnose the current status quo and the choice of reasonable development strate-gies. Further remarks shall focus on these very issues. The first will refer to universal ques-tions, whereas the next will be specific to Poland.

Taking into account the differences between telecommunications, information technol-ogy and electronic media observed so far, it is difficult to assume that the convergence process aimed at a universal, global information infrastructure will be an easy and short one. This process will surely be a sum of numerous, complex interactions in the fields of economy, technology, society and culture. The final outcome of these interactions is indeed difficult to predict. Moreover, its seems rather unlikely that convergence can actually lead to forging a single, homogenous entity, offering some sort of universal telecommunication, information and media services. It is much more probable that at a given stage of the process new divisions will appear, although it is difficult to guess at the criteria of such divi-sions. One can only assume that they will be a result of shaping separate application fields, such as work, education, entertainment, etc., where new types of complex services will be offered. These complex services will be a conglomerate of simple services currently offered by telecommunications, IT, and media infrastructures.

This process of market formation has already begun, although it is not very advanced. The characteristics of the current stage are:

- numerous and rapidly changing mergers of companies from various sectors of the information market,
- creation and bankruptcies of many Internet service providers,
- huge debt of telecom operators (so profitable until recently) resulting from licensing fees paid to the states, growing competition and over-investments in new types of technical resources and services,
- significant fluctuations of stock value of IT sector companies.

The structure and economic model of the information sector in general, and the telecommunication sector in particular, becomes obsolete, whereas new forms are still being developed. The recent experiences related to the "internet bubble" clearly indicate that one should not count on magical solutions that will shape a new face of the informa-tion sector at an instant. Many factors indicate that the excitedly optimistic attitude towards investments in third generation mobile telephony (UMTS/IMT) has given a time bomb that can cause another major shock in the information industry.

The lack of mature framework of the information infrastructure is evident, not only in its economic aspect, but also in the area of technical resources and services. The services offered currently, fascinating and useful as they are, are only a foreshadow what one can expect of the future. However, developing and launching new services and their applica-tions is difficult and marked with considerable risks. For instance, a complete fiasco was made in the attempt to popularize video-on-demand services, although until recently they had been a source of great expectations. Another example: contrary to what has been often said, public Internet telephony has not been introduced on a large scale. Similarly, the introduction of WAP and GPRS services in mobile telecommunication has not brought the expected results. Many innovative services have been rather short-lived. The quest for serv-ices that could become a strong and steady driving force of the mass market – the quest for *killer applications* – is still under way. Conditions for relatively stable, shockproof devel-opment are still far away.

The lack of stability in the economy and services is also visible in the area of technical resources, although apparently this area is much more immune to economic, institutional, legislative and other fluctuations. Telecommunication technical resources are particularly notorious for their instability. The tremendous success of the Internet has brought about a belief that Internet technologies, combined with the methods of network construction and creation of new services, are nearly omnipotent. It was generally believed that traditional integrated network technologies (ISDN and B-ISDN) should be abandoned and replaced with Internet technologies for the purpose of developing network and service infrastructure

in telecommunications. The foundation of such a conviction proved very weak. The development of Internet technology into something capable of serving as the basis of a universal technical platform for future information infrastructure turned out to be much more difficult than expected. The key issues that still need to be solved are quality of service, reliability and security. The conviction of the Internet's omnipotence has become history. The prevailing view now is that the network infrastructure should be developed in a hybrid way, i.e. using the best parameters of classical telecommunications (integrated networks) and the Internet, thus coupling the functionality of the latter with ISDN/B-ISDN. This new concept has been labeled New Generation Networks, or NGN. It is another step forward in the long path leading to the creation of a technical telecommunication and information platform that will be able to face the challenges posed by the advances in information services. However, we are still unable to see the end of this path.

To summarize the above: even in the most advanced countries, the process of forming a modern information infrastructure is undergoing the stage of an intensive search for the most suitable solutions in the areas of institutions and regulations, services, and technical resources. There are still more questions than answers. Poland, as a developing country, can draw important conclusions regarding its developmental strategy. These conclusions are presented below, together with a handful of remarks on the state of affairs observed so far.

Poland should take an active part in the process of searching for optimal ways of developing information infrastructure, especially when it comes to its institutional and legislative dimension and the area of services and applications. This is where Poland can create bold, innovative and far-reaching solutions that will stimulate the expansion of information services in all areas of social and economic life. The quality of these solutions – more than their saturation with technical resources – will determine the infrastructure's functionality. Preparation of such solutions does not involve major capital investments – it is enough to skillfully use intellectual capital, vast resources of which are available in Poland. Unfortunately, little has been done to that end so far. The steps taken are usually declarative and/or partial, and are forced by the Poland adaptation to the regulations of the European Union. Parliamentary or governmental documents about information society development are usually poorly made copies of EU documents, their content is very general and hardly corresponds to conditions specific to Poland. The authorities seemingly are still unaware of the fact that the development of information structure is not only a condition that must be met for further social and economic growth, but also a major chance for Poland: a chance for making up for the country's civilization delays. Since the new face of information structure is only now being shaped in even the most advanced countries, Poland's underdevelopment in this area is unimportant. Another opportunity like this may not happen again for quite some time.

To take advantage of this opportunity means to recognize the broader context of information infrastructure development related to initiating and channeling social and economic development, and first of all, to define the state's role in this respect. Although undoubtedly market mechanisms of infrastructure development have always been and will always be the most important, it is also impossible to overestimate the role of stimulating (or, alas, curbing) state policies. So far, the strategy of Polish authorities has been passive. Few positive examples, such as state subsidies for the computerization of schools, are usually isolated and not correlated to a broad, consistent and far-reaching policy.

An example of a passive and short-sighted way of thinking is the new telecommunication law passed recently, after many years of preparation. This new law has focused on issues that will soon become unimportant from the standpoint of the development needs of a modern information infrastructure. It is primarily concerned with removing barriers in developing traditional telephone services, and not with creating conditions stimulating development and popularization of a modern infrastructure of services and technical resources. Apart from the lack of so-called political will and imagination, there were no obstacles to the introduction of a much more innovative set of rules that would cover the entire information infrastructure.

When another law is introduced, and such a need will appear sooner or later, one should first of all consider the convergence process and aim at establishing an independent body that will take over the responsibilities of today's Office of Telecommunications

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Are Internet service providers responsible for information content?

One may wonder whether the Internet service providers (IPS) have something in common with suppliers who are party to delivery agreements, sales agreements, etc.

In any such agreement the supplier is responsible for providing his/her customer with a given product, usually owned by the supplier. Quite frequently, the supplier also manufactures the products covered by the agreement in question. Meanwhile, the role of IPSs with reference to the relationship between senders and receivers is quite different. Not only do they not create the information contents sent by senders, but also have no influence on it and are usually unaware of it. Their role is limited to that of infrastructure manager, or even "forwarder" of the information contents.

One could compare holding IPSs responsible for the information contents sent through their infrastructure to blaming an airways company for the fact that one of its passengers smuggles drugs.

However, despite clear-cut differences between "providers" and "suppliers", some publications, or even court verdicts, seem to force IPSs to take on a role they do not aspire to: a role of a police officer, judge, and an executioner all in one.

On the other hand, the range of the Internet, its global character and unique possibilities, make it necessary to look for solutions that could include – within reasonable limits — IPSs fighting Internet abuse. Apparently, the biggest problem is to define those reasonable limits. While child pornography, racism, or bomb-making manuals by all accounts represent serious legal concerns, one may argue whether IPSs should take an active part in fighting illegal advertising or piracy.

Is an IPS, whose infrastructure carries illegal content (let us say, pirated music), an accomplice to the crime? ISPs are usually unaware of such things. Should they be legally obliged to censor the traffic going through their servers? If yes, ISPs would become censors, police officers, prosecutors (investigating the crime) and judges (deciding on what is and what is not legal). So far, law enforcement is carried out by bodies established for this very purpose. Should we abandon this principle?

It goes without saying that ISPs are obliged to obey decisions issued by authorized bodies, aimed at law protection and fighting legal abuse.

Therefore, except for cases where an ISP is indeed guilty of a crime, either as a result of deliberate actions or of professional negligence (when he/she failed to take reasonable steps necessary to identify a crime). IPSs should not be held responsible for the contents they transmit. They should, however, assist authorized bodies or persons and interrupt a given transmission on the basis of a proper legal title (a court decision, prosecutor's warrant, etc.).

It seems that it is not a step in the right direction to try to find new legal solutions that would impose additional obligations on ISPs or hold them responsible for events they do not take part in

Regulation (URT) and the National Radio and Television Broadcasting Council (KRRiT). The mission of such a body would be to regulate the entire information market.

Creating consistent law with regard to the information infrastructure, and not only to the telecommunication sector, calls for a modern approach to the role of generally available services. It is quite possible that the right decision will be to replace the notion of generally available services with that of access to information services. This is a very complex issue that can only be solved if the state's policy on the information infrastructure, and its role in the country's development in particular, is clearly defined.

Adopting solutions voiced herein will not be possible without explicit legislative initiatives on the part of governmental agencies. The replacement of the Ministry of Communications, as Poland has known it so far, might turn out to be the right decision, as long as the ministry is replaced with a strong governmental body responsible for shaping the country's policy regarding the development of the information infrastructure. Should that not be the case, one can expect even greater passivity of the government, and consequently of the parliament, in this respect.

In general terms, the level of information infrastructure development in Poland is a parameter of the social and economic level of the country. Thus, Poland is located in the bottom of the list of OECD countries. The distance between Poland and the leading coun-

tries is large. One should also consider the fact that the level of information infrastructure and its availability are not uniform throughout the country in terms of geography and social groups. Therefore, the gap between the more advanced western part (Poland A) and the less advanced eastern part (Poland B) is widening. Whenever any steps aimed at spurring the growth of the information infrastructure are taken, the above fact should be considered with great care. A fast growth rate of information infrastructure in the economy will be demanded by market mechanisms; the role of the state in this respect boils down to securing conditions for the proper functioning of these mechanisms. In the public area, however, where direct influences of market mechanisms are limited, the state's active policy is of significant importance. The final level of information infrastructure in this area will show whether Poland is building an information society for all, or an information economy for the few.

3.4 Michał Goliński

Selected economic statistics concerning information and communication technologies

Prices of stationary
telephony services
in 1999

	World	USA	Germany	France	Sweden	Spain	Czech Rep.	Hungary	Poland
	94.00	44.00		49.17	128.00	158.00			141.00
	6.50	19.90	47.00	12.60	13.80	10.70	101.00	142.00	4.60

by the autor, on the basis of ITU 2001

	World	USA	German	France	Sweden	Spain	Czech	Hungar	Poland
	15.16	67.30	y	58.17	66.46	40.99	Rep.	y	26.27

Availability
of stationary
and mobile telephony
in 1999

by the autor, on the basis of

Relation of outlays
on software
to outlays on hardware
in 1999

by the autor, on the basis of WITSA 2000

LXI

Average annual
growth rate of outlays
on IT in the years
1992-1999

	World	USA	Germany	France	Sweden	Spain	Czech Rep.	Hungary	Poland
	7.5 %	7.8 %		4.3 %	2.1 %	2.2 %		16.3 %	27.0%
	8.5 %	5.2 %	3.9 %	3.2 %	−1.6 %	1.6 %	13.4 %	25.1 %	39.7 %

by the autor, on the basis of WITSA 2000
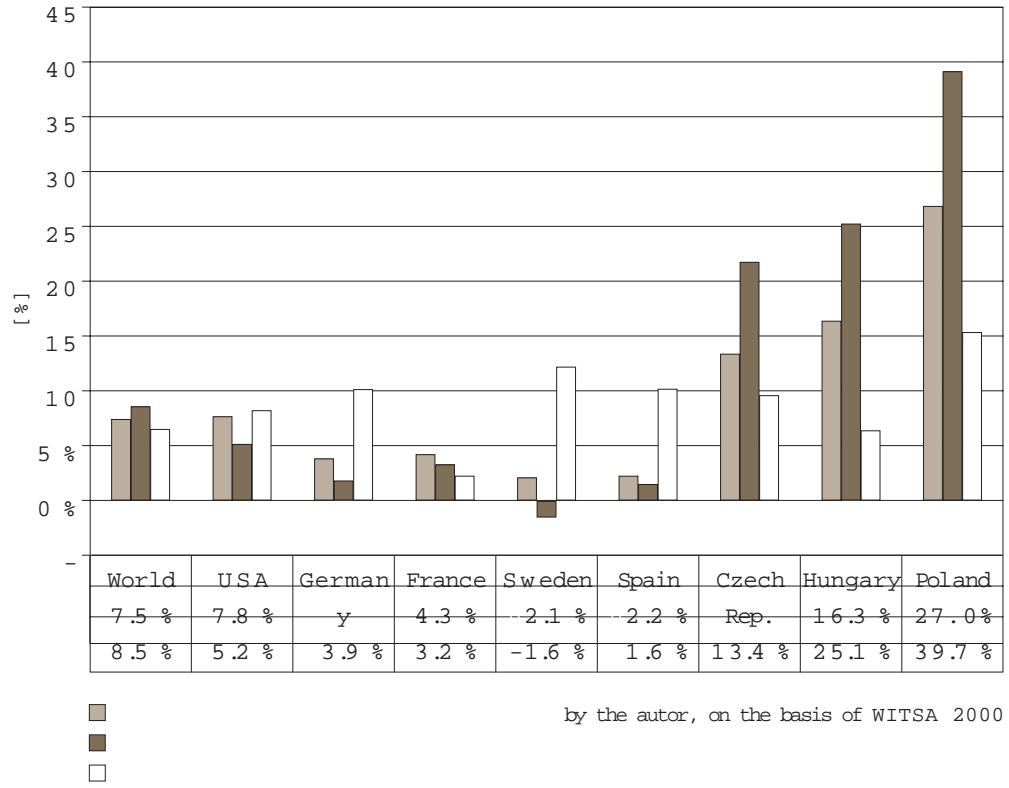
Outlays on IT
per capita
and as a share
of GDP
in 1999

| 6.6 % | 8.9 % | 5.3 % | 6.0 % | 9.3 % | 4.0 % | 8.5 % | 6.4 % | 4.9 % |

357. 673. 417. 390. 357.

by the autor, on the basis of WITSA 2000

Outlays on ICT
in 1999

by the autor, on the basis of ITU 2001

Outlays
on telecommunication
in 1999

by the autor, on the basis of ITU 2001

Outlays on IT
in 1999

by the autor, on the basis of ITU 2001
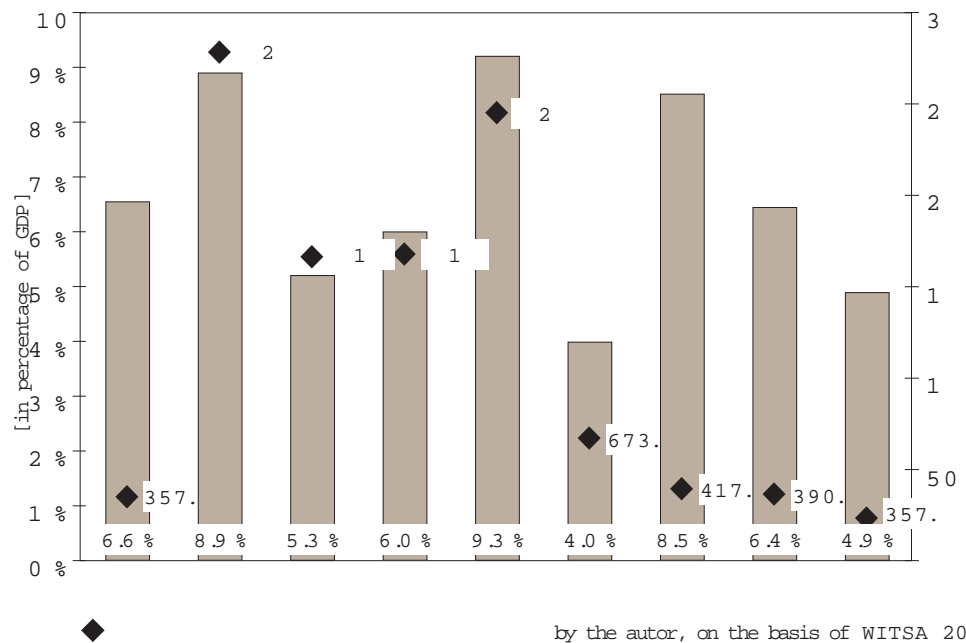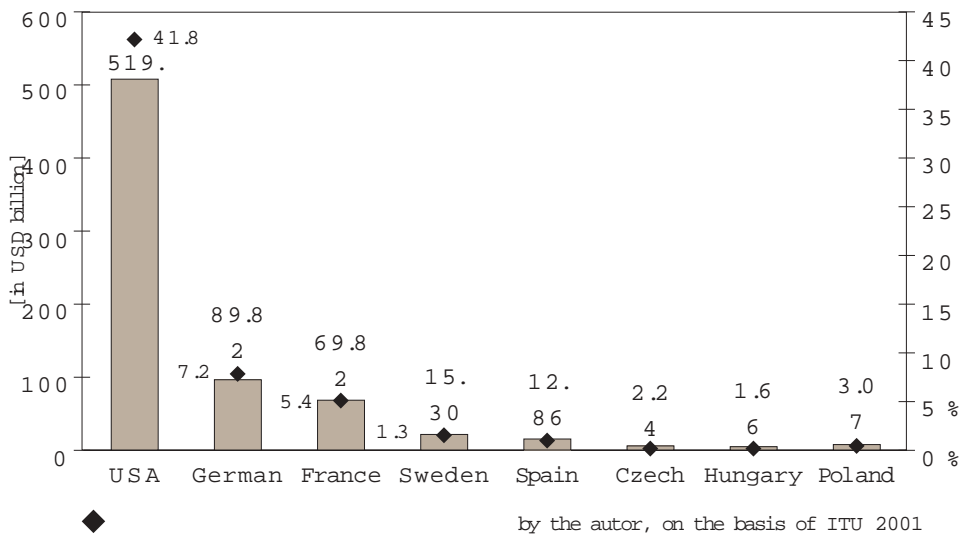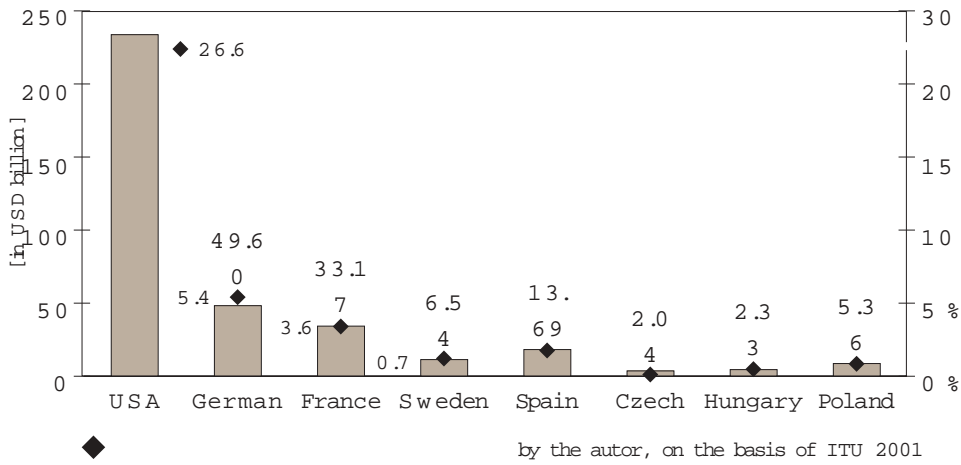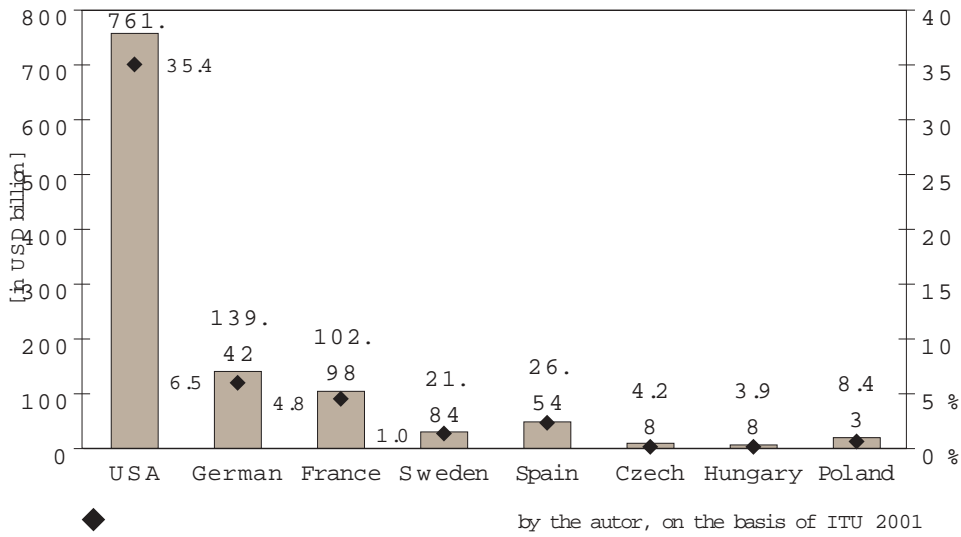
Availability
of information
and communication
technologies
in 1999

[per 100 inhabitants]

	World	USA	German	France	Sweden	Spain	Czech	Hungar	Poland
			y				Rep.	y	
	15.16	67.30		58.17	66.46	40.99			26.27
	8.22	31.55	59.03	36.56	58.29	30.60	37.09	37.09	10.21
	1.20	19.50	28.57	2.10	5.90	1.17	18.95	16.21	0.44
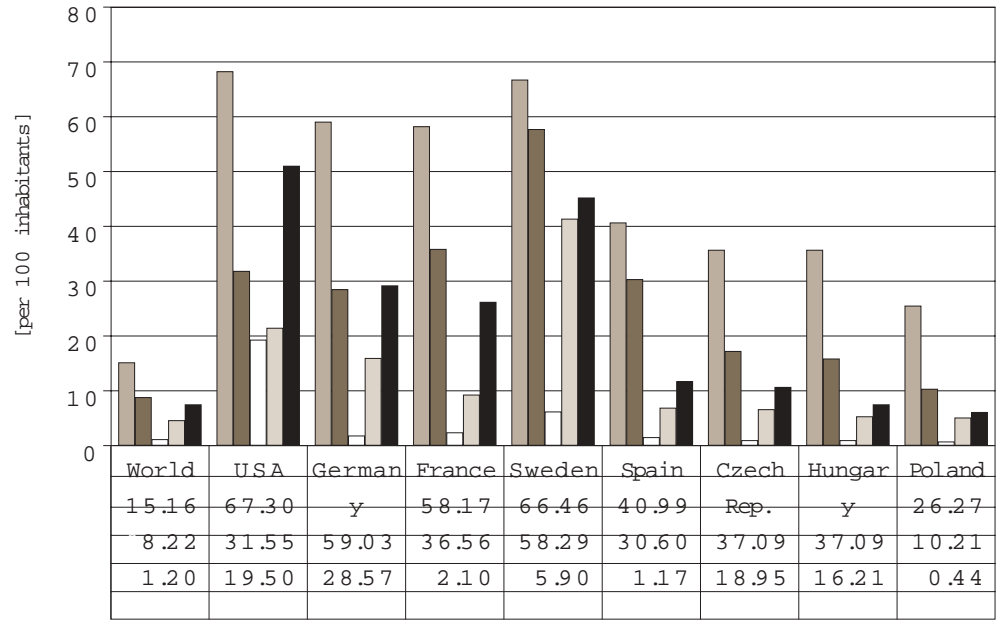
by the autor, on the basis of ITU 2001

Average
annual growth rate
of stationary
and mobile telephone
subscribers in the years
1995-1999

[in %]

	World	USA	German	France	Sweden	Spain	Czech	Hungar	Poland
			y				Rep.	y	
	5.7 %	2.6 %		1.0 %	−0.6 %	1.6 %			15.3 %
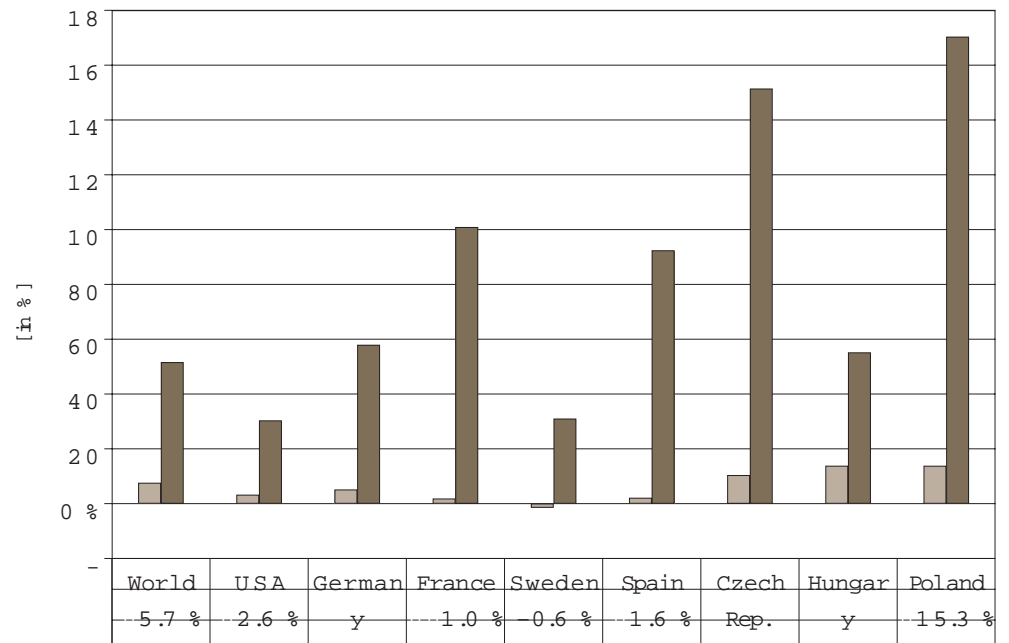
by the autor, on the basis of ITU 2001

3.5   Adam Niewiński
The readiness of the Polish economy to compete on the global market

There are several reasons why "global market", "global processes", and "globalization" are buzz words these days. One of the reasons is that achieved production levels are so high that in many areas one company is capable of satisfying a major share of the world's needs. Another reason is the possibility of effective management of geographically distributed units constituting a global enterprise, or of establishing cooperation between separate companies from all over the world. A decisive factor in globalization is the growing importance of information and knowledge in economic processes and projects. Another key aspect is the possibility of cheap, simple, and fast data transmission over the Internet. All these phenomena are accompanied by strong pressure on the removal of the artificial barriers (laws, tariffs, etc.), i.e. on liberalization of the world trade, negotiated during consecutive meetings of the World Trade Organization (WTO).

It is still to early to talk about the effects of globalization. Its opponents try to draw attention to the exclusion threatening the underdeveloped countries due to globalization that opens world markets to advanced countries who will be able to dominate the areas previously occupied by poorer states (such as ethnic music, herbal medicine, or local trade). Therefore, it may turn out that the importance of underdeveloped countries will decrease not only in relative, but also in absolute terms.

However, globalization coupled with information and communication technologies can be a way of achieving economic growth and avoiding recession. Of course, advanced economies, such as that of the USA, seem to be in the position to take the greatest advantage of these opportunities. The size and flexibility of capital and labor markets has allowed the USA to develop research in new technologies more quickly than elsewhere. Openness of the American market to international trade followed by growing imports has helped to hold down prices. As a consequence, the USA has enjoyed the first economic boom after World War II that has not been shattered by inflation. E-business technologies have led to a considerable growth in the productivity of the economy. Internet services have made transactions faster, and in many cases also simpler. Allan Greenspan, the president of the Federal Reserve, believes that the Internet and globalization has helped keep wages in the USA at a relatively low level due to an increased labor uncertainty, which is a natural consequence of the increased flexibility of global markets. Globalization has resulted in increased competition, which has translated into a greater number of mergers and acquisitions which, in turn, combines and lowers management costs.

An analysis of Poland's position, at the threshold of further economic transformations resulting from intensive growth of e-economy, brings one fairly obvious conclusion: active development and adaptation efforts will give Poland a great opportunity to find an attractive place in the new global division of tasks and competences, whereas the lack of intensified actions and simple watching the changing world may marginalize Polish companies and reduce Poland's position to that of an underdeveloped country.

As a result of globalization processes, domestic markets become open to foreign competition, and foreign markets become open to domestic companies. Polish enterprises will have to defend their local markets and vie for foreign ones. In global terms, Polish companies, even the larger ones, are not big. However, due to the Internet, competition barriers relating to business scale have been removed and even smaller companies can now compete on global terms. They can, for example, build their corporate identity or brand in geographically remote markets, which would have, otherwise, not been possible. When it comes to intangible products and services, one does not need an expensive sales network in a given market to be able to sell its products. Any company with Internet access can organize a tender for purchasing products or services from suppliers worldwide. This presents a major opportunity for Polish companies, who usually offer very competitive prices: since in this system of purchasing, price and quality are of the utmost importance, it is

enough to meet tender requirements to find customers even in distant markets. Additionally, active monitoring of tender requirements informs local companies about the demands and needs of the most advanced markets. Many international giants already use a method of centralized purchases through a web site. Polish companies can be their suppliers. Therefore, it is key for Polish business people to learn about such systems and acquire skills necessary to manage them.

A major opportunity for Poland would be to gather a unique expertise on the Central and Eastern European markets. One of the basic barriers in developing international corporations is the lack of knowledge about specificities of local markets. Moreover, such countries as Hungary, the Czech Republic or even Poland when, considered separately, are usually of minor importance to international corporations, because their markets are too small. Possible construction of multinational trade platforms seems profitable for all, because only the sum of individual potentials guarantees a critical mass. This solution can be hampered by local pride and nationalism which has already blocked the merger of stock exchanges of the above countries. However, the creation of trade platforms does not necessitate changes in legislation, and the only access criterion is the possibility to achieve additional profits. Therefore, high hopes are attributed to such projects as www.ce-market.com, a local metal trade platform. Although it has been unable to compete against www.metalsite.com, its global counterpart, it stands a chance of becoming an important market partner, as an integrator of offers from the entire region.

In e-economy, the market is subject to dynamic changes, as brand new sectors appear. Quite naturally, right in the beginning these sectors do not have any market leaders. Such companies as AOL, Ebay, Yahoo!, E*Trade, or German Consors have been built from scratch and their success shows that new sectors and technologies represent unique opportunity for new companies to go global. This is the chance for Polish enterprises, because it is rather doubtful that a Polish company will become a leader in one of the traditional industries. The first key to success in a new sector is innovative scientific research aimed at identifying forthcoming trends and also the early development of the necessary technologies and solutions. Moreover, it is indispensable that government, science and business actively cooperate in order to prepare the background and infrastructure necessary to take the position of an initiator and a leader in a new industry. This would allow Poland to attain a strong position, comparable, for example, to that of India with respect to research and development in genetics.

Poland should also focus on Internet-based export of its intellectual resources. One can expect that in the years to come broadband Internet access will cause a huge demand for a wide scope of multimedia products and services. Based on having numerous artists with the talent to exploit the resources of Polish as well as international culture, Poland can specialize in global exports of certain categories of multimedia products and services. Production of musical and graphic forms on a large scale could significantly influence Poland's export volume.

Another option open to Poland is to create centers based on relatively cheap intellectual resources, similar to India that has become a world provider of software services, and Ireland who has gathered customer service centers of companies from all over the world. Poland has the possibility of becoming a global leader in universal consulting services in such areas as medicine, engineering, architecture, etc. With respect to these kinds of services, the geographical location is unimportant. They are developed primarily on the basis of accessibility to cheap, yet, highly qualified human resources.

Unfortunately, the survey of Poland's perception as a potential location for new information and communication businesses indicates that the country needs to make a concerted effort, in order not to lose its historical chance of becoming an active participant rather than passive spectator in the global division of tasks and competences. In a recent report by Healey&Baker – a global real estate agency – Warsaw ranked 25th among 26 European cities investigated as possible locations for such investments. Hungary's Budapest ranked 22nd, and the only city below Warsaw was Trondheim, located in the far northern region of Norway. The 201 respondents to the survey stated Warsaw's basic problems as being the following: the city is relatively unknown, it does not have a reliable technical infrastructure, lacks technology professionals, poor English language skills among those available, no scientific research centers, difficult access to global markets, and non-existent

state support for technology investments. The companies surveyed declared that the only strong argument in favor of Warsaw is the low cost of labor.

Last but not least, let us mention the relationship between globalization and integration of Poland with the European Union. First, let us recognize that for the EU, the transformation to e-economy and adaptation to the needs of the global information society is of utmost importance. Therefore, Poland must not limit its strategy to merely copying solutions currently applied in the EU, just as it cannot be our strategic goal to achieve the current economic level of the weakest EU countries within 5 or 10 years. A real chance for true progress lies in taking an active part in globalization processes available today, before Poland's entry into the EU. Poland's progress towards the globalization will make the country a valuable, if not equal, partner with the remaining EU countries. On the other hand, Poland's access in itself will surely not make it a technologically advanced country that plays an active role in the global division of product manufacturing and service provision.

3.6   Borys Czerniejewski
Science and innovation in service of the economy

In the information society, knowledge is the basic factor in production. Knowledge replaces capital, although it does not eliminate it. The source of knowledge is research and development efforts. Knowledge gives birth to innovative processes whose constant aim is to perfect existing products, organizational structures, production, business processes and human resources[1]. Innovative efforts include: design and construction works both with reference to tangible and intangible products and services; purchases of new technologies; engineering industrial equipment; pre-manufacture development, production start-up; and finally marketing new services[2].

In Poland, the development of scientific research is a prerogative of the central administration, where separate sectors are ascribed to corresponding ministries. This is strongly related to the sections of the state budget, stipulated by the Central Administration Act of 1997. In accordance with this act, financing of science is a responsibility of the Ministry of Science – the President of the State Committee for Scientific Research, whereas economic development is financed by the Ministry of Economy, and schools are financed by the Ministry of Education and Sports. One should add that the Minister of Science grants subsidies to three types of institutions: universities (but only for statutory and researchpurposes, since education is financed by the Ministry of Education), institutes of the Polish Academy of Sciences (again for research purposes only), and finally to other research and development units, which are also subsidized by the responsible ministries. Surprisingly, it is impossible to identify the exact number of such units, because the data provided by the Central Statistical Office (GUS), State Committee for Scientific Research and Information Processing Center differ in figures by over 20%. The State Committee for Scientific Research subsidizes 107 universities, 81 institutes of the Polish Academy of Sciences and about 240 R&D units and their affiliates. Such a system of financing is hardly transparent and it makes it difficult to couple scientific research with the economy.

For several years, private universities have been established in Poland and currently number 225, a total that is literally growing on a daily basis. None of these universities receive any subsidies for statutory purposes from the Minister of Science, and only 11 receive funds for research. However, research teams from these universities can apply for subsidies for research projects, granted twice a year on the basis of a contest. Secondary and primary schools in Poland are financed by local governments.

Companies are eligible for state subsidies for innovation work only in so-called "earmarked" projects. This mechanism allows funds to be obtained for R&D work covering up to 50% of all costs (up to 70% in extraordinary cases). However, if a subsidy is granted,

1
M. Goliński, Gospodarka i informacja [Economy versus information]. In: J. Lubacz (ed.), W drodze do społeczeństwa informacyjnego [Towards the Information Society]. Politechnika Warszawska, Warsaw 1999 [in Polish].

2
The proposed standard practice for surveys of research and experimental development. Frascati Manual, OECD 1993.

R&D work must be carried out by an R&D unit. For many years, the State Committee for Scientific Research has been complaining that businesses rarely take advantage of this possibility. It seems probable that the private sector is simply unaware of the above procedure. Besides, the formalities related to it are so complicated and the period of verifying applications is so long (six to twelve months), that this program is not attractive for businesses. It is especially visible in the sector of advanced technologies, where product lifetime was dramatically shortened, sometimes it is comparable to the period necessary to complete all formalities required by the Committee.

Start-up research capital, at the stage of implementation and production can be credited by the Agency for Techniques and Technologies managed by the Ministry of Economy, recently transformed into the Polish Agency for Enterprise Development. Although this mechanism operates as a complement to earmarked projects, the institutions actually do not cooperate. Even the best results of R&D work financed by the Committee do not guarantee that the Agency will grant a loan. The coordination of the work of separate ministries if their focus overlaps seems indispensable, especially when it comes to supporting innovations in the economy.

The lack of coordination between the State Committee for Scientific Research and the Ministry of Economy translates into weak ties between science and business. This is not only a problem of Poland — it can also be observed in the European Union, although it does much better than Poland. Since 1984, the EU has established so-called framework programs for technical research and development. The purposes of these usually four year programs are to strengthen the links between science and business and to increase transfer of technologies, in the hopes of increasing competitiveness with the USA and Far East countries. These are achieved by financial support for international projects initiated jointly by scientific and industrial organizations. Upon Poland's access to the 5th framework program in September 1999, Polish enterprises gained access to the EU's resources as well as an opportunity to cooperate with researchers and business people from the Union. However, the interest for this type of cooperation turned out to be lower than expected, which is mainly due to language problems, time-consuming and complicated procedures, the poor financial conditions of Polish companies, and poorly prepared information campaigns that did not reach potential business partners. The German experience shows that effective promotion of research programs in industry can be carried out only by specialized private companies, and not by R&D units, as was the case in Poland.

Poland's outlays on research measured in relation to GNI per capita are low and amount to 0.8%, whereas the average EU level is 1.9%, as compared to 2.6%[3] in the USA. One should, however, notice major disproportions between individual countries, corresponding to their economic advancement. Most notably, Finland's outlays are higher than the USA at 2.8%. The Polish level is comparable to those of Spain, New Zealand, RSA, Hungary, and is higher than those of Greece, Portugal, Argentina, and Mexico. It seems then that the outlays on research are adequate to Poland's economic development. Nevertheless, Poland must make sure that economic growth is properly reflected by increased outlays on research; it is possible to stimulate it by offering preferences for more advanced, especially high-tech industries and for larger companies that typically invest more in research than small and medium sized ones.

In 1999, 30.6% of outlays on research in Poland came from business sources. This is lower than in the EU, where out-of-budget financing accounts for 50.8%, and in the USA, where it has reached 68.5%. Here again, one can also notice major discrepancies between individual countries (e.g. Ireland's business financing is higher than the USA and amounts to 69.4%). In this respect, Poland is comparable to New Zealand, and outpaces Greece, Portugal, Argentina, and Mexico. Again, the level achieved in Poland does not indicate that the share of non-budgetary financing of research is lower than it should be, taking into account the country's current condition[4]. While it is true that non-budgetary outlays in the Czech Republic (60.2%) and Slovakia (60.4%) are much higher, a result of state-owned laboratories in those countries having been privatized, many of which went bankrupt as a consequence. These two countries are currently facing the problem of reconstructing their research infrastructure[5]. Due to economic recession, the share of out-of-budget financing went down to 24.5% in 2000[6], but it should be expected that this trend will also be confirmed elsewhere.

[3]
World Development Indicators. World Bank, Washington D.C. 2001.

[4]
J. Kozłowski, S. Kubielas, Stan nauki i techniki w Polsce [The state of Polish science and technology], Komitet Badań Naukowych, Warsaw, 2001 [in Polish].

[5]
M. Daszkiewicz, Permanentne oczekiwanie [Permanent awaiting]. Sprawy Nauki 11, 1999 [in Polish].

[6]
G. Niedbalska, D. Piechal, A. Dobosz, Nauka i technika w roku 2000 [Science and technology in 2000]. The output of GUS investigations. Information notes. GUS, Warsaw 2001 [in Polish].

Well-targeted industrial and tax policies can stimulate the growth of outlays on research in the private sector. In the era of globalization, it is not possible for one country to be a world leader in too many areas. Instead, countries should identify and prioritize the direction of industrial development, paying special attention to advanced technologies, including the TIME sector (telecommunications, information, media, entertainment). The development of these "research-intensive" industry sectors can be accelerated by larger outlays on research by private companies. A good incentive for investments in these sectors would be the creation of technology transfer centers at universities, as well as technology parks, which typically operate near major university centers. This kind of initiative cannot succeed without the supportive attitude of local governments that can be of help when it comes to finding a location and securing municipal infrastructure. They can also grant land tax and real estate tax incentives.

The Polish counterparts of state-owned laboratories (mentioned above with reference to the Czech Republic and Slovakia) are R&D units that carry out research mostly for industrial purposes. They were typically established at large, state-owned enterprises who were their natural customers. After most of these enterprises had been privatized, many units practically lost their reason for existence. For two years now these units have been undergoing reform. It is proposed that some of them will be closed down, merged or privatized, and some – transformed into State Research Institutes, carrying out research for the state (e.g. the Institute of Meteorology and Water Resources Management). All the others will probably continue to act as R&D units pursuant to the Research and Development Units Act of 1985, amended in 2000. Therefore, some units could become part of the companies they previously serviced. This is by no means simple, because many of these companies have joined international corporations with their own research centers. The reform should therefore be carried out with great care, on the basis of Czech and Slovak experiences, so as to avoid the scattering of Poland's scientific potential. Research financing should grow in the production sector.

At present, Polish companies could generally be divided into three classes: old state-owned enterprises – either left unchanged or still being restructured; subsidiaries of international corporations – usually formed as a result of privatizing former state companies; and finally small and medium sized private Polish enterprises. Although the reasons vary, none of these groups are interested in investing in research. The first group is facing serious day-to-day problems and perceives innovations as an unnecessary luxury. The second group, as stated before, takes advantage of laboratories located in original countries of the corporations. The third group is economically weak and lacks investment capital. However, a new group of companies is appearing. It is composed of bigger domestic companies that have the necessary financial resources and whose owners understand the importance of technological development. This group already includes about 400 companies[7], which corresponds to Poland's economic advancement. The formation of this group is rather slow, although it has been assisted by mergers and takeovers that make it possible to gather the critical mass more quickly. It is true, especially with respect to such market segments as IT, where capital outlays on R&D have been relatively low. The situation is much more complicated where specialized equipment is necessary (e.g. in electronics). It must also be stressed that as a result of the current recession, R&D expenditures are one of the first to be reduced. Therefore, the number of companies to declare such expenses went down by 20% in 2000 compared to level declared in 1999[8]. This negative trend can be stopped only by applicable incentives on the part of the state.

Within the last couple of years the share of outlays made by foreign companies as a percent of the total volume of business outlays on research has grown from 2% to about 20%. These outlays are larger than the expenditures of private domestic and state-owned companies, whose number has declined considerably as a result of privatization. It must be remembered, however, that only a part of this research financed by foreign businesses has been carried out in Poland, and is usually result of absorbing new technologies coming from parent companies[9]. In 1998, all research outlays of foreign companies in Poland amounted to 5.1% of total research outlays, whereas in Ireland, where very favorable conditions are offered in this respect, this ratio amounted to 68%[10].

A positive trend that can be observed in Poland is the establishment of development centers by international telecommunications and IT corporations. Such centers have been

7
G. Niedbalska,
D. Piechal, A. Dobosz,
Nauka i technika..., op.cit.

8
G. Niedbalska,
D. Piechal, A. Dobosz,
Nauka i technika..., op.cit.

9
J. Kozłowski, S. Kubielas,
Stan nauki..., op.cit.

10
G. Niedbalska, R. Sławeta,
Polska nauka i technika '98
[Polish science and
technology '98].
Sprawy Nauki 5, 2000.

established in Cracow (Motorola and FQS-Fujitsu Kyushiu), Gdansk (Intel) and Katowice (ICL). These centers usually have access to university resources and have been situated near technology transfer centers as mentioned above. Another incentive for investors are so-called special economic zones that offer preferential conditions to investors and will continue to exist until 2017. However, the conditions offered conflict with EU's legislation and has presented problems in negotiations between Poland and the EU. The key issue is the unlimited level of income tax deductions, regardless of the actual investment value. It seems that demanding a transitory period that would protect these zones from the Union's legislation is one of the key elements of Poland's negotiating strategy. However, even the most favorable financial conditions will not attract investors if the zones are not equipped with the necessary infrastructure, and helped along by streamlining the procedure of obtaining investment licenses. It is crucial that Poland works out a coherent and uniform strategy regarding these zones.

Another important element to incentive strategies for encouraging investment would be the introduction of stable tax regulations. Up to this point, Polish business laws have been changing all to often, and the rules and levels of business taxes have been unpredictable as a result. Naturally, this does not speak in favor of investing in Poland. The right solutions have been adopted in Ireland, where the tax rates are known in advance: investors already know the tax rates that will be applicable up to 2025.

As mentioned before, small and medium enterprises in Poland usually do not have sufficient financial resources to carrying out research and development programs. This problem can be solved by venture funds made up of funds from both the state and private investors. Such funds already operate in Great Britain (Enterprise Fund), Australia (Innovation Investment Fund) and New Zealand (Venture Investment Fund). Venture funds can be created and co-financed by local governments, just like in the USA, where 20 states participate in such funds[11]. To that end, it is necessary to have a legal definition of principles applicable to public-private partnerships. So far, cooperation between the private sector and state administration is not possible in accordance with the current legislation; thus existing contacts between the two are usually speculative. It is worth noting here that Polish companies are already eligible for grants from the European Investment Fund, established by the European Union (represented by the European Commission) and, albeit indirectly, by EU member states (through the European Investment Bank).

What is characteristic for Poland is a relatively high number of scientists and researchers, as compared to the country's economic development. Information about the number of scientists holding at least a doctorate, grouped in 62 disciplines defined by the State Committee for Scientific Research, has been collected by the Information Processing Center. Out of 5569 scientists in the fields of information technology, electronics, automatics and robotics, telecommunications, and biocybernetics and biomedical engineering, 4262 have a doctoral degree, 720 are associate professors, and 587 are professors. The table below shows the numerical data broken down to separate disciplines:

Discipline	Doctor	Associate professor	Professor	TOTAL
Information technology	1 082	202	148	1 432
Automatics and robotics	549	125	106	780
Electronics	1 098	152	131	1 381
Biocybernetics and biomedical engineering	96	25	31	152
Electrical technologies	1 368	246	191	1 805
Telecommunications	371	57	52	480
TOTAL	4 564	807	659	6 030

11
R. G. Heard, J. Sibert, Growing new business with seed and venture capital: state experiences and options. National Governors' Association, Washington 2000.

Unfortunately, the database run by the Information Processing Center includes data from questionnaires where scientists are free to state the discipline they work in, and not the one in which they have been awarded their scientific degrees. The questionnaires also make it possible to indicate more than one discipline, which is why the sum of data for indi-

vidual disciplines does not correspond to the above numbers. The database also includes data about scientific specializations within the above disciplines. Specializations are not formally standardized, and this is why telecommunications has 287 specializations, and information technology – as many as 1 002! Almost 7 out of 10 specializations are represented by only one scientist. Every second researcher claims two or more specializations. They usually state specializations that should be classified elsewhere, or whose names are identical to the name of another discipline. The database includes information about 63 Polish scientists working abroad, however this information is largely incomplete.

In accordance with the data provided by Polish Information Processing Center, out of all scholars residing in Poland and having at least a doctorate, 1 829 specialize in electric technology, 1 459 in information technology, 1 415 in electronics, 783 in automation and robotics, 482 in telecommunications, and 154 in bio-cybernetics and biomedical engineering. However, the respondents to the Center's survey could claim more than one field. With modest budgets for science and research, such high numbers of academic staff result in low wages that cannot compete against those offered in the private sector. As a result, Poland is now witnessing major shortages among younger scientific staff, which may lead to a generation gap in the country's science. This problem was addressed at the 2nd Polish Information Technology Congress in 1998[12]. The recent economic stagnation slowed down this process, since private companies have fewer new jobs to offer. However, another worrying phenomenon has been the fact that individual researchers are employed in several institutions simultaneously. This has resulted in lower quality of research and unrealistic data about the country's scientific potential. Tempted by higher wages, researchers have taken positions at private universities, but – for the sake of prestige – do not leave their jobs at state-owned research institutions. This is partially due to the fact that private universities have not existed for too long and have been unable to develop a name for themselves. This system of double employment makes it even more difficult for such universities to gain a good reputation.

Another feature of Polish science, is the relatively high share of outlays on basic research (36%) as compared to applied research (25%) and development (29%). In the USA, for instance, the shares of these three components amount to 16%, 23% and 61%, respectively, and in France – to 21%, 29%, and 50%[13]. The structure of subsidies in Poland is mainly due to low outlays from the private sector, which typically finances marketable assignments classified as development. State subsidies are mainly allocated for basic research. This explains why applied research, which is of strategic importance, is under-invested, which hampers the progress of the advanced technology sector. The proper development of this industry largely depends on a country's scientific policy. Evidence of this can be seen in such achievements as time-sharing systems, computer networks, routers, workstations, fiber optics, integrated circuits (RICS and VLSI), parallel processing were all a result of state-financed research or governmental projects[14]. Similarly, the basic standards of digital audio broadcasting (DAB) and third generation mobile telephony (UMTS) were developed due to research projects financed by the European Commission.

Poland has so far failed to clearly define its scientific policy. The extremely democratic structure of the State Committee for Scientific Research having priorities established in an autonomic and uncoordinated way has been a cause for a kind of paralysis in this respect. Attempts at setting long-term priorities used to lead to the writing of a list that included nearly all areas of scientific research. As a result, the areas receiving the largest subsidies were considered priorities, which was the exact reversion of a proper cause-and-effect relation. As a result, financial resources were too scattered, research was re-creative rather than creative, and complete, practicable solutions were hardly ever achieved[15]. However, in 2000 Poland adopted an amendment of the State Committee for Scientific Research Act of 1991 which gave the Minister of Science, President of the Committee new prerogatives in shaping the country's scientific policy. Sadly, these prerogatives have not been fully exploited. The priorities established by the Minister overlap with those of the 5th European Union Framework Program for Research and Technical Development, including the so-called information society technologies. Only 30% of all resources allocated for statutory purposes (that is for day-to-day functioning of research institutions) was distributed in line with these priorities. The priorities for advanced technologies should be made clearer and more precise. This has also been eluded to in governmental papers: "It is indispensable (...)

12
W. Iszkowski (ed.),
Rozwój informatyki w Polsce.
Stan, zalecenia, perspektywy
[Development of information
technology in Poland. Status
recommendations, perspectives].
Report of the 2nd Congress
of Polish informatics,
Poznań-Warsaw 1999 [in Polish].

13
J. Kozłowski, S. Kubielas,
Stan nauki..., op.cit.

14
The economic and social impact
of electronic commerce:
preliminary findings and research
agenda. OECD, Paris 1999.

15
M. Daszkiewicz,
Permanentne oczekiwanie...,
op.cit.

to increase the outlays on research projects in such advanced areas as computer networks, distributed systems, parallel processing, computer-supported decision making, databases, human-computer interaction (including natural language processing and speech recognition), artificial intelligence, virtual reality, bioelectronics, "artificial life", cognitive psychology, control systems, management systems, optoelectronics, photonics, satellite transmission systems, etc."[16]

Poland has had relatively few state-financed research programs open to private organizations. Although the newly amended State Committee for Scientific Research Act has made all research institutions, both private and public, equally eligible for state subsidies, in practice, scarce as they are, all funds go to the three institutions named in the beginning of this section. Meanwhile, private foundations for research support in the USA and in Germany receive around 80% of their budgets from the state, and 60% in Sweden[17]. With missing structural support, such as governmental programs or local initiatives, innovation projects of Polish companies seem to be rather shallow and usually boil down to purchasing foreign equipment and/or patents, because these investments guarantee a relatively quick return. This phenomenon is not negative in itself, because it indicates a growing respect for intellectual property and has resulted in modernization of the country's industry. What is worrying has been a low number of domestic patent applications by Polish inventors, amounting to 59 per one million inhabitants. This is nearly ten times fewer than in the USA (573) and six time fewer than in the EU[18]. While it is true that the number of patent applications corresponds to the country's current development stage (characterized with non-patented innovations), it needs to be emphasized that the number of applications has been falling recently, contrary to the numbers of registration applications for trademarks and decorative patterns[19]. Additionally, low level of innovation significantly influences the structure of Poland's export, where highly processed technical goods account for ca. 30%, as compared to about 70% in the more advanced countries[20].

The above discussion clearly show that research financing based only on private resources is a myth. Therefore, the key question is, not whether innovation research should be co-financed by the state, but rather at what stage should the state stop its support. It seems reasonable that at the stage of applied research, innovations in strategic areas can be supported or even fully financed by the state, independently of the legal status of a given institution. The only criterion should be the research capacity of an institution, i.e. qualifications of personnel and quality of technical equipment. Research projects should be eligible for subsidies independently of their future results. The state budget should take into account the success rate applicable to a financed projects, varying from one area of research to another, defined on the basis of global statistical data (e.g. OECD's). In order to minimize the failure rate and preserve the adopted success rate, research projects should continue to be verified by teams of experts, composed of both scientists and industry professionals. State subsidies for complementary research should be gradually decreasing in proportion to the time left before a given product or service is launched on the market. The country's budget should also be involved in promoting technologically advanced domestic products. This should be done both by funding prizes and promotional logos (e.g. "Now Poland" logo), and by organizing and co-financing fairs and exhibitions as well as supporting the participation of Polish companies in foreign trade events. Manufacturing technologically advanced goods should be supported by a well prepared tax policy, which refers also to foreign investors. Establishing research centers should become one of the key elements of privatization strategies. Implementing new equipment and production technologies, especially in SMEs, should be financed by low-interest Treasury loans. Local governments should receive incentives to create the favorable conditions and support investments in advanced industries. The central government should foster competition between local governments in this respect.

16
Cele i kierunki rozwoju społeczeństwa informacyjnego w Polsce [The goals and directions of the information society development in Poland]. Ministry of Telecommunications and State Committee for Scientific Research, Warsaw, document adopted by the Council of Ministers on November 28, 2000 [in Polish].

17
M. Daszkiewicz, Permanentne oczekiwanie..., op.cit.

18
J. Kozłowski, S. Kubielas, Stan nauki..., op.cit.

19
G. Niedbalska, R. Sławeta, Polska nauka i technika..., op.cit.

20
G. Niedbalska, R. Sławeta, Polska nauka i technika..., op.cit.

3.7 Dariusz Kupiecki
Public sector serving the economy

It is difficult to envisage the public sector in the information society era. It will largely depend on the models of political organization of public life adopted by individual countries. As a consequence, the tasks of public administration can be more or less widespread, and will depend on the extent of regulative and protective functions of the state. It is indeed difficult to find a reason why the popularization of information technologies should automatically increase or decrease the role of the state.

There are certain invariable permanent roles for public administration valid in all the societies. In whatever role, the administration should use information technologies to fulfill its tasks the most efficiently. Administrative efficiency will be one of the competitive factors in the global market, since the quality of administration has direct influence on efficiency of the economy.

The invariable roles where public administration cannot be replaced are those of mediator, patron, distributor, guardian of the public interest and service provider.

As a **mediator**, public administration should protect fair play in economy (i.e. fight monopolies, dumping, law-breaking, etc.). In the information society, equal opportunities in the economy will be much more dependant on equal access to information, reliability of data provided by companies, and new forms and scopes of mandatory reporting. This is a vast topic for political discussions, but when it comes to the forms of transmitting and publishing information there should be no doubt: both the existent and future methods of communication in an information society must be allowed and legally admitted. This concerns both the reporting of all kinds (traditionally or via Internet) and publishing financial results in a uniform way. In this role, public administration must also ensure the reliability of business by supervising certification authorities of the public key infrastructure (cf. the box "Digital signature").

The second function of public administration is that of a **patron**. Each properly developing economy has a wide sector of small and medium size enterprises (SME). This is a sector of high social importance, because it creates many more jobs than any other sector. In the information society, due to large costs of investing in equipment for data processing and transmission, SMEs can be handicapped compared to large corporations. Therefore, public administration will be obliged to provide legal regulations and incentives for protecting the SME sector.

Public administration acting as a **distributor** is responsible for providing access to limited resources (natural environment, radio waves, air space, etc.). This is an ongoing function which always receives criticism as to the manner it is carried out, often suspected of a mishandling of resources. The information society techniques make it possible to render such functions fully transparent through easy access to clear information on available resources, conditions of allocation of the resources, and the decision-making processes. As a consequence, the distribution of resources will be more effective, and the chances of competing parties will be more equal.

Public administration will also be acting in the capacity of the **guardian of the public interest**, with respect to both crime-stopping and introducing protective regulations. Therefore, the state will have to provide efficient, comprehensive and cheap access to information about product and service safety standards, especially in the face of the expected growth in the dynamics of changes of manufactured products, including personalized ones. The public interest will need proactive consumer protection offering quick reactions to possible abuse through fast and effective alerting.

Administration has always been and will continue to be a large market of products and services, as long as the state's budget is large and the taxes are high. As a result of the advancing globalization, competing for public contracts in an information society will become more and more difficult, and the market will be tainted with corruption, unless

applicable procedures are simplified and shortened, and contracts are equally easily accessible to all. This can be achieved by the application of already-known IT techniques (publishing invitations to tender on the Internet, sending quotations by e-mail, reverse auctions for standardized goods or services). All that is necessary is the good will of law makers, as well as regulations making Internet use allowed (or obligatory) with respect to tendering procedures.

Social pressure for an increased efficiency of administration along with a simultaneous decrease of budgetary resources will result in outsourcing many administrative processes that will be performed by enterprises. The market of such services will be a dynamically growing one due to possible mass-scale application of Internet solutions: if the end-product of a given business process is information, the place where it is performed is unimportant. These solutions will provide more flexibility to the structure of administration, which still remains in its 19th century calcified hierarchies and separate departments. It would be a wise move, on the part of public authorities, to face the new trend and organize the administrative structures in the form of small, cooperating units that exchange information with their business environment in a coherent way through jointly managed information gateways.

The role of public administration as an **information provider** will be growing. It is debatable when and what charges should apply for offering access to information. There are important arguments both in favor of and against charge for a state information service: on the one hand, the information is gathered with taxpayers' money; on the other, a party requesting free information uses the taxes paid, not only by himself but also by its competitors.

If properly processed and available, the huge amount of diverse information owned by the public administration can constitute important resources of a country's economy and become a new factor of economic growth. However, this calls for both the establishment of a legal framework and entrepreneurial skills in creating a new intermediary market that links the owners of unitary, unprocessed information and consumers demanding valuable, synthetic, information prepared and presented by means of modern tools.

The functioning of judiciary in an information society is a separate issue. The current judiciary system will slow down social development in a fast changing reality. Companies cannot wait for months for a court's decision. It seems virtually indispensable to accelerate procedures by deployment of electronic document flow and to widen the prerogatives of arbitration courts.

One of the key attributes of public administration is the fact that its operations are limited to a particular geographical area. As globalization in the economy advances, this feature will more and more seriously limit the harmonious development of administration, and thus the society. Moreover, it might become a growth factor of such negative effects of globalization as international crime. Considering these threats, public authorities should pay closer attention to adapting their structures and administrative functions to acting on an international scale. This will involve the following.

• Establishing horizontal ties between local administrative centers in individual countries, especially with respect to law enforcement. These contacts can no longer be limited to central agencies;

• Unification of technical standards, patent rights and copyrights. Different understanding of various terms and application of separate legal solutions to these areas will make it difficult to include Poland in international trade and business. Uniformity, in turn, will allow for mutual recognition of standards and laws between individual states. For Poland it will be increasingly important to recognize decisions of international bodies as legally binding in the country's internal legal system, although it must be remembered that such a limitations of the state's autonomy may be painful for the society;

• Taking into account the local legal situation of the interested party, when issuing an administrative decision. Administration will be increasingly involved in dealing with foreign entities. The way of settling a case should depend on the rights and obligations of such entities provided by legal systems applicable to their official seats. To that end, countries will need to adapt, develop and make more precise the procedures of settling administrative cases. These procedures should take into account more than just division into domestic and foreign organizations; this simple dichotomy should be replaced with verification of a com-

Wojciech
Cellary

Similarities
and differ-
ences
between banks
and public
administration
on their way
towards
the electronic
economy

In Poland, banking is the most advanced sector as concerns application of e-business solutions. Banks apply these solutions to all kinds of their relationships: bank-to-customer, bank-to- business and bank-to-bank. Administration, in turn, is the area where the largest number of actions wait to be undertaken. Therefore, it is purposeful to identify similarities and

Banking	Administration
digital product: money	digital product: documents
money circulation rate determines the efficiency of the economy	document circulation rate determines the efficiency of the economy
a bank acts as a single institution with unified management	administration acts in the form of numerous institutions that have to cooperate
competition is the driving force of development	educated, knowledgeable management is the driving force of development

differences between the two sectors:

One could ask, why is educated knowledgeable management the driving force behind deployment of e-business solutions in public administration? The answer is: because there is no competition in administration. Therefore, adap- tive changes in the public sector usually result from growing frustration of the society who use democratic methods to demand a remedial program from politicians. Educated knowledgeable management of administration can foresee such demands. It can understand what social

pany's capacity to carry out a given action, according to both local and foreign legal system. For example, it may consist in checking whether a given company is licensed to carry out its business or what its legal status is and what consequences it has for the local legal system. These variations will be especially important with respect to taxation issues;

• Unifying public administration structures of different states. It is hoped that clear functionality of administrative structures will be of help to foreign companies in dealing with Polish local authorities as well as Polish companies dealing with foreign authorities. This will be possible if similar issues are solved by similar offices. This unification will be a painful and time-consuming process due to historical conditions and social traditions. Therefore, it will be much easier to implement administrative intermediation as a new type of service with a unified way of information exchange and intensive application of modern communication techniques.

4.1   Wojciech Cellary

Human — computer: confrontation on the job market

Let us start the attempt at imagining what working in a global information society is going to be like by observing our well-known industrial society. The industrial society was characterized by a human versus machine confrontation: a wash-woman versus a washing machine; a digger versus an excavator; a weaver versus a loom. The last ones are remembered as an example of a futile rebellion of humans against machines, a rebellion that failed because in this confrontation machines were invincible. (Obviously, the last statement refers to a general trend and not to a state – in our society humans still perform plenty of physical activities, whose automation would simply be economically unprofitable).

Therefore, humans have largely concentrated on "mental" work, as opposed to "physical" work, where they feel safe since machines had not reached there. In an information society, however, human versus machine confrontation is substituted by human versus computer confrontation. As history tends to repeat itself, one can assume that people are again going to be defeated in this confrontation. Indeed, computers will always be better than humans at performing "mental" tasks that are repetitive and predictable. Computers are quicker than humans, more reliable, have more information at their disposal, work twenty four hours a day, seven days a week, do not take medical leaves, do not go on holidays and generally are much cheaper. This means that in an information society so called "mental workers" who perform routine, repeatable tasks will not be needed in the job market. This especially concerns broadly understood administration assistants in companies and offices.

Therefore, the following question arises: what will humans do? The answer is: non-repeatable tasks, because computers can only do whatever they have been pre-programmed to do and are unable to create. Humans will be left with the task of creating new knowledge in all possible areas and passing it over either to other people or to computers, which is, in fact, another name for computer programming

In a market economy, a company looking for economically reasonable solutions, the question whether to use a computer to perform a certain task or to employ a human will be answered in the following way. If a task is well-defined (i.e. if an algorithm of its solution is specified), it is repeatable and does not need human-to-human contact – in such a case a computer is a better tool to perform the task. On the contrary, if a task is creative, non-repeatable, or it consists of contact with other people, then an employee is a better solution.

Let us now look at the computer-or-human problem from the point of view of a customer, as customer acceptance is one of the decisive factors in the choices made by companies. Here, the question of customers' trust in their own skills is of fundamental importance. If a customer believes that unaided he or she can:

- understand the information about products or services – it is difficult in the case of new products or services, where a certain amount of additional knowledge is needed to understand the essence of the novelty,

- carry out an analysis of competitive offers, and
- make the right decision,

then he or she will choose a computer instead of a human. Choosing a computer, he or she saves time and money.

If some customers do not trust themselves – do not trust their own knowledge or ability to acquire complementary knowledge – they will look for another human and they will rely on the choices he/she makes on behalf of them.

With a certain degree of simplification, one can claim then, that in the information society on the job market specialists in "computers" and specialists in "humans" will be sought. The work of the first group will effect in digital products and services to be later exploited by computers. The aim of their work will be to create new digital products and services as well as improve (in terms of technology and marketing) and personalize existing digital products and services. The effects of the work of the second group will be to develop and enhance relationships with customers. The aim of their work will be to gain new customers as well as build customers' loyalty.

The two basic criteria of employment and then evaluation of employees will be: creativity and communication skills. (It is worth noting that both these abilities are not currently being taught at schools, either at the grade school levels or at universities.)

In more detailed terms, employees will be expected to cooperate within their own culture as well as within other cultures. Interdisciplinary skills will be a must. Employees will have to specialize in their field while at the same time will have to possess enough knowledge from other fields to cooperate with specialists of those fields, since the best results are achieved at intersections of several areas. Finally, employees will need to be independent. This independence will be understood in two ways: as an ability to independently raise problems, not only solve them, and as a self-discipline allowing one to work on his/her task without supervision. For a company, it is much more profitable to employ self-disciplined people who properly carry out tasks entrusted to them and do not need to be supervised, than people lacking self-discipline, who have to be supervised by other employees, who in turn have to be paid for that work.

Expectations towards employees working in direct contact with customers will also change. Evidently, companies evolve from selling what they have in stock to producing whatever they are capable according to customers' wishes and demands. Therefore, the aim of an employee will not be to talk so as to be understood by a customer, but rather to listen to and understand the customer, so that the company can individualize products and services to fit the customers needs.

4.2 Wojciech Cellary
Labor market in electronic economy

Changes in an economy transforming into electronic economy certainly influence the labor market. The demand for manufacturing work in an electronic economy will be definitely lower. The process of transformation of agricultural economy into industrial economy resulted, at least in highly developed countries, in the decrease importance of peasants and rural workers for the benefit of those employed in industries. Similarly, the process of transformation of an industrial economy into an electronic economy will cause the reduction in the significance of industrial workers for the benefit of widely understood service providers. Already, nowadays, in advanced branches of industry a relatively small number of people are required: microprocessors and integrated circuits, constituting a significant economic sector, are produced exclusively by robots. There are also few people required to produce computer boards and electronic equipment as well as car engines – several hundred workers in a single production plant are capable of manufacturing hundreds of thou-

sands engines a year. On the contrary, jobs for people are in the service sector – IT services sector, where a constant shortage of specialists is observed worldwide, car services – tests, repairs, varnishing, etc.

For the purpose of this analysis let us recall the division of services into tangible and intangible (digital), introduced in Chapter 2. Tangible services are rendered locally – as for example nursing services, the demand for which is going to grow as average life expectancy will be longer. Intangible digital services are those rendered remotely over the net. They consist in either creating certain information – projects, documents, software – and sending it to a customer via network, or in communication with other people. In both these cases we will deal with far-fetched individualization. For example, imagine that a customer needs a book cover photo – instead of choosing one from a photographer's catalogue, the customer will order a new photo defining its general and imprecise characteristics.

Extreme mobility will be the main characteristics of digital service providers. Using the net, they will be able to move at any time to a chosen place around the world, or to be more exact, to every place in the net. However, parts of the world not connected to the net will be out of economic interests, and will not participate in the main stream of the world's economic development. In other words, locality of a job market will be defined by cultural markers and not by geographical location of employees. For example, if somebody needs a Polish-speaking accountant to perform a certain task, then it is the language that predestines a given person to perform this task (obviously apart from such factors as professional skills) and not the place where he/she lives.. Whether such a person lives in Poland, Canada or Argentina is of no importance, as his/her job will anyway be provided over the net. We may therefore expect that similarly to emerging global electronic exchanges of goods, global exchanges of job will be created in the nearest future. Professional skills of people will be traded there, since the aim of such markets is not selling what has already been produced and what is in stock (as is the case in a goods exchange) but providing what one can produce, in response to unique needs of a customer. Therefore, what is subject to trade are in fact human skills. Coming back to the example of the book cover photo, such electronic global job exchanges will give one access to thousands of photographers around the world, differing mainly in the cultural aspect of their work, out of which one can choose whomever one wishes to employ.

Using the net for managing economy bears several essential consequences for the job market. As mentioned above, one of them is the mobility of employees in the net, which has no counterpart in the industrial society because of strong ties between work and place of living, which is one of the characteristics of industrial economy. This mobility in a natural way promotes cooperation of one employee with several employers – those who can offer an appropriate job at a given moment. Another consequence is that the net, along with information and communication technologies as well as information systems, provide an opportunity to efficiently manage large groups of people working in various locations. There is no need, then, for gathering people in one place – one company facility – to manage them directly. Managing cooperation between small specialized units is much simpler. Those units are used in line with demand, i.e. with the tasks to be done, and only when such a task appears. The units are selected on an already mentioned job market exchange. Such an organization provides the opportunity for global operation. As our globe is multicultural – there are plenty of languages, customs, law systems and therefore various needs – a global company must also be multi-cultural. Then such a net of independent units is the most effective.

This is where we reach the essence of problems related to human labor. If economy will require small, mobile and specialized units – "economic commandos", in military terms – then the division between employers and employees reduces and even disappears. An employee having his/her own economic unit, or rather being self-employed, is simultaneously an employer and an employee, a natural and a legal person.

In the industrial society, most workers were employed full-time. The way of providing work was fully determined by the employer. The employer made all decisions concerning work and took full responsibility for them. The worker was only obliged to perform his/her work well. He/she was not responsible for what would happen with the product of his/her work – especially whether somebody was going to buy it or not.

In the light of technical and economic changes, such an organization of the market with such a plain and – let us add – legally protected division of responsibilities cannot be preserved in the global information society. Employee wages depending on the financial result of business will be a natural tendency. Wages will not be treated as a fixed element of costs. Already today many small companies operate in the following way: every employee registers as a self-employed person and acts independently, but is subject to common management, covers his/her share of costs and participates in the division of profit on the basis of a prior agreement.

The above labor organization contributes to different division of risks related with a probability of losing a job or becoming disabled, which always accompany the life of a human. In an industrial society this risk was divided between the employee who had some rainy day savings and was insured against the risk he/she considered to be the most threatening; the company which, for example, paid out a leave benefit to the employee in case of a dismissal caused by economic recession; and the society, which established disability pension systems. In the case of self-employment the company drops out, because it is tantamount to the employee. Nowadays the share of risk which was once taken by the company is being passed on the employee. Whether it should be so is still an open question.

4.3   Urszula Sztanderska
Changes in job structure

Until the 1990's the Polish job market was characterized by a significant structural stability. The subsequent economic system transformation proved that a contemporary job market is flexible and the changes that takes place therein call for serious adaptations to the supply of labor. One of the key changes currently occurring and also expected to continue in the near future are the change in job structure[1]. One of the basic reasons for this change is the transformation of the economy into an electronic economy, where the role of information processing grows dramatically. On the one hand, the professional structure of the job market is under going changes (new professions appear; a demand for services of some professional groups increases, while the others decrease). On the other hand, the character of the duties performed within traditional professions changes – the old work requires new methods and new professional skills.

The transformation towards the information society has a multi-aspect influence on the functioning of the job market. First of all, information technologies as such, generate a demand for labor in the sector responsible for developing, upgrading and applying these technologies. Second, the functioning of traditional economic sectors that produce well-known products and provide well-known services (and their modernized versions) gains new perspectives as a result of the upsurge of an information gathering and processing capability. Third, the structure of end-demand of households may be expected to change significantly , because household preferences of goods and services that satisfy traditional and new needs will change. Fourth, for exactly the same reasons, the end-demand structure of the public sector will also change. Fifth, since the processes of transformation towards the information society in highly developed countries is much more advanced than in Poland, it can be expected that the trade relationships between Poland and those countries will change, followed by changes in the internal production and employment structure. Finally, all the above changes, especially the technological ones, will lead to dramatic changes in labor and capital productivity. Therefore, those changes will have an influence on the dynamics of economic development and the proportions of applied production factors, as well as their relative prices. As a consequence, those changes will influence the employment rate of the potential (demographic) workforce, as well as the proportion of work and leisure.

The above paragraph highlights the demand side of expected changes; in other words, it shows how information changes will influence the final demand and manufacturing

[1]
Structural mismatch factors of the job market throughout 1992 to 1998 achieve the highest values with regard to the professional dimension; they indicate that the mismatch of supply and demand of labor in this respect could be one of the key reasons of unemployment. Compare: M.W. Socha, U. Sztanderska, Strukturalne podstawy bezrobocia w Polsce [Structural basis of unenployment in Poland]. PWN, Warsaw 2000, Chapter 2 [in Polish].

technologies, thus shaping demand for labor in terms of professions. The supply side will probably not be the driving force of the expected transformation. However, the supply side must be taken into account, mainly as a factor constraining the professional changes inspired by the demand. Also, the analysis cannot pass over the coincidence of the transformation towards the information society and other crucial processes, as an aging society, the integration of Poland with the European Union, and changes in the average income and its distribution. The effects of all these processes are interdependent.

It is self-evident that widely understood information technologies open a big labor market for people who are directly involved. A long-term prediction of labor demand in Poland (until 2010) has shown that hardware and software engineers are included among the expected 20 fastest growing professional groups: hardware engineers — a 2.6-fold growth as compared to 1996, or 6.5% per annum; software engineers — a 2.2-fold growth, or 5.5% per annum[2]. Another projection that was based on a different methodology[3] and covered the period until 2005 also pointed at the same professional groups (expected growth of 55% — 61% within 5 years, which translates into an annual growth of 9% — 10%, or 40 thousand in absolute numbers). Taking into account the information technology gap between the most advanced countries and Poland[4], one can expect even greater demand for labor in these groups in the years beyond the analyzed periods. Partially, the labor demand will concern new professions. Some of them will emerge from already existing professions or specializations, while others are even difficult to predict. Generally, it is believed that information and telecommunication technologies will provide a great number of jobs in new professions: some sources estimate their total number between 85 and 150 thousand by 2010[5].

Functional changes of traditional economic sectors will be mostly due to an increase in labor productivity, especially of people whose work consisted of simple information processing. As a consequence, the demand for such labor in relation to the volume of provided goods and services will decrease. On the other hand, productivity of other types of labor will increase, because workers will be assisted by new kinds of equipment as a result of information and communication technology development, or other technological development.

It can be expected that the labor expenditure per product unit in traditional economic sectors will decrease as a result of coupling information technologies with general technological development. For example, the share of employment in the industry will continue to fall, with a simultaneous growth of production volume. Increased industrial production accompanied by stable or falling employment was observed in Poland in the 1990's, mainly due to the industry restructuring that had been delayed when compared to more advanced countries. The influence of information technologies on employment in industry have been very limited so far — this is why its effects will certainly appear in the future.

It seems probable that increasing exchange of information will cause standardization of services similar to standardization of industrial products. On the other hand, it will become much easier to individualize traditional products to meet particular needs. Decreased laboriousness of some services, such as commerce (replacement of direct customer servicing with e-commerce) or financial services (e-banking instead of bricks and mortar banking) does not have to mean that the demand for labor in commerce and finances will shrink significantly within the next 10 or 20 years. In Poland, these services are still underdeveloped, while the demand of an ever richer society will shift towards them. The tendency to cut employment due to increased efficiency will be to some extent counterbalanced by an increased demand for such services. The replacement of traditional, labor-intensive services with electronic ones may also entail increased employment in the same sectors, however, different professions: for example, e-commerce involves both standardized information service (certainly requiring higher qualifications than traditional commerce) and personalized product shipment. This change is also related to a new division of labor into professional tasks and activities carried out for a household's own needs. So far, customers have usually had to go to a given institution to be provided with a service. The development of information technologies makes remote servicing a viable option, thus providing increased leisure time.

One can also expect profound changes in other services devoted to individuals. For instance, the share of distant learners will grow which will make it possible to use a teacher's labor in a more efficient way than in a traditional school gathering pupils, stu-

2
Szacunek zapotrzebowania na główne grupy zawodów RCSS [Estimation of the demand for main professional groups]. Międzyresortowy Zespół do Prognozowania Popytu na Pracę, Studia i Materiały, vol. 3, Warsaw 1999 [in Polish]. The paper assumes that within four years (1994-1998) the number of representatives of both professions in Poland increased by 40 thousand.

3
Wielowariantowa, średniookresowa prognoza popytu na pracę w Polsce w przekroju 369 grup zawodowych [Multivariant, mean-range forecast of labor demand in the profile of 369 vocational groups]. ZBSE, GUS and PAN, Warsaw 2000 [in Polish]. Method based on the general balance model.

4
In 1994, the employment level in computer services amounted to 0.17% of total employment in Poland, whereas in the USA the same level amounted to 0.58% already in 1979. Source: A. Karpiński, S. Paradysz, Studia nad możliwymi kierunkami zmian w poziomie i strukturze zatrudnienia w Polsce w perspektywie roku 2010 [Research on prospective directions of the level and structure of employment in Poland until 2010]. Komitet Prognoz „Polska XXI wieku" PAN, Warsaw 1996, unpublished report [in Polish].

5
S. Borkowska, A. Karpiński, Analiza powstawania nowych zawodów oraz propozycje uwzględnieniatych zawodów w modelu prognozowania popytu na pracę [The analysis of the emergence of new professions and recommendations how to include them into the model of labor demand forecast]. IpiSS, Komitet Prognoz „Polska 2000 plus", PAN, Warsaw 2001 [in Polish].

dents or trainees. Similarly, doctors will be able to remotely diagnose their patients. The concomitant changes will partially shift the demand for labor from direct suppliers of unitary services to developers of repeatable processes composing services. In most cases, it is even difficult to give a name to such professions.

Also in the area of traditional professions there will be a growing demand for information-related labor. It seems justified to trust the projection claiming that the demand for (1) business consultants and trade agents, (2) operators of automated assembly lines and industrial robots, (3) secretaries and office equipment operators, (4) other office employees, (5) financial and statistical employees, (6) business experts and (7) training experts will grow dynamically (it is expected that the growth rates between 1996 and 2010 for each of the above groups will amount to 3.2, 2.2, 1.9, 1.6, 1.6, 1.8, and 1.7 respectively)[6]. However, the character of these professions – in line with the predictions presented above — can change significantly.

There is no ample basis for expecting structural changes in consumption demand, stemming from society informatization. It seems that profound changes may only take place in information consumption (reducing the share of traditional media), entertainment (e.g. remote participation in some cultural events, development of diversified entertainment packages, etc.), or household services (e.g. managing so-called intelligent houses). Due to an education gap (mostly with respect to higher education and life-long learning)[7] one can expect an increased demand for education services, also an increased access to information. This tendency will grow in proportion to the wealth of the society and the so-called free consumption fund. The professions which are expected to have the highest rate of growth in demand include also artists (a 1.6-fold growth by 2010 as compared to 1996) due to more free time and higher income. The above group is also comprised of secondary school and academic teachers, as well as other educators and instructors[8]. It seems probable that the demand generated by households will lead to increased employment in software and hardware services directly targeted at individual consumers and not at businesses. It is however difficult to predict whether it will result in separate professions or just specializations within the same professions.

There are no reasons to predict the changes in labor demand generated by the administration sector, although some basic trends are already noticeable in the most advanced countries. In this countries the public sector has been equipped with modern data storage and processing tools. Similar equipment can be expected in Poland in the army, police, and central and local administration services: employment, customs and tax authorities, statistics, judiciary, environmental protections, etc. One can also expect changes in computer applications following from the needs of specialization: for example, the police does not need only simple data that are gathered and retrieved, but also needs processed information – for example on the logistics of patrols, crime records, etc.

Basing on the fundamental theories of foreign trade[9] one can indicate a supply role of computerization. If Poland reaches a relatively high level of saturation of personnel involved in computerization, then the relative prices of information products will be low. As a consequence, Poland may become a net exporter of such products. Otherwise, the personnel qualification structure that does not match the evolving demand will preserve the domination of trade specialization in traditional industries[10]. In the long run this will lead to the equalization of prices of production factors, i.e. increased wages for simple works, but it will also reduce the advantages of foreign trade. Low supply of professionals in widely understood information technology and applications, as well as shortage of traditional professionals able to use software tools and technology can slow down economic development with all its consequences.

A necessary condition of transformation towards the information society is a considerable increase in the supply of computer professionals and people with good computer literacy working in traditional economic sectors. It is also necessary to generally improve education, in particular education including computer skills. The undertaken efforts to make secondary education a standard, and introduction of lessons on computers and software to all the secondary schools is just a good first step of a long journey. It is necessary to be aware of the changes in the demand for labor and to modify the education curricula accordingly. This refers both to the question of new professions and new skills taught to traditional professionals, also those who graduated a long time ago.

6
ibid.

7
In 1998, the average share of persons with higher education in a population of 25 to 64 years of age amounted to 21.8% in OECD countries, and to 10.9% in Poland. The share of learning employees amounted to over 50% in OECD countries and to 11% in Poland. Compare: J. Liwiński, M.W. Socha, U. Sztanderska, Wykształcenie a rynek pracy [Level of education and labor market]. In: Ekonomiczne i społeczne efekty edukacji [Economic and social effects of education]. Instytut Współczesnych Problemów Cywilizacji, Warsaw 2000 [in Polish].

8
Limited demand for elementary teachers results from a demographic decline.

9
Comparative cost theory by Heckscher-Ohlin.

10
The study of Polish foreign trade exchange in the 1990's shows that the country is delayed in terms of education, which has a negative influence on both economic growth and the structure of foreign trade and its advantages. Compare: M. Brzozowski, M. Greszta. J.J. Michałek, K. Śledziewska-Kołodziejska, Handel zagraniczny a edukacja [Foreign trade and education]. In: Ekonomiczne i społeczne efekty edukacji [Economic and social effects of education]. Instytut Współczesnych Problemów Cywilizacji, Warsaw 2001.

The Governmental Labor Demand Forecasting Taskforce established in 1998 has begun developing a labor demand forecasting system in terms of professions and geographical distribution. It has also initiated the first forecasts[11]. If the efforts of this taskforce are not intensified and its results are not disseminated and converted into enforceable policies in education and the labor market, Poland will not be able to cut its losses caused by wrong allocation of resources, i.e. teaching obsolete professions and failing to teach the ones which are the most required, because they push the country to emerge as a member of the global information society and electronic economy.

4.4   Wojciech Cellary
Telework

Telework and its characteristics

Telework is defined as work provided remotely by means of electronic media, such as the Internet, telephone, videophone, etc.[12]

Generally speaking, telework concerns information or communication services. In the first case, we deal with somebody who creates information, for example, a journalist who writes an article and then sends it by email to his/her colleagues, or a lawyer who prepares a contract and then discusses it with his/her advisers and negotiates it with the other party over the net; or a programmer who writes software and installs it on a remote computer, or finally an accountant who classifies documents and inserts data into the company's accountancy system using a remote connection.

In the case of the communication services, telework concerns, for example, managing customer hotlines: a purchaser of software can call such a telephone hotline and receive assistance in the software's installation. Another example are call-centers, whereby voice information for customers is partially generated automatically and partially supplemented by human assistance. Finally, remote communication services are used in telemarketing: employees make phone-calls or send email messages to potential customers and try to convince them to buy certain products or services.

In the popular understanding of telework it is associated with work performed at home, usually by two social groups: the physically disabled and women. Obviously, these ways of understanding telework are definitely too narrow.

While it is true that telework can be provided from the employee's home, it can also be carried out from the premises of an employer, where the employee provides remote services to the company's customers. Another work site can be a **telecenter**, which is basically an office equipped with computers with fast Internet connections, telephones, faxes, and – optionally – videoconferencing devices. Such a telecenter can be established and managed by one employer, shared by many employers to reduce costs, or established and managed by local administration to facilitate the creation of new jobs in the area.

Telework is also a constituting element of so-called **flexible office**, where the number of physical work positions is lower than the number of employees, and of **mobile office**, contained in an employee's portable computer. This type of work is especially useful for professions that demand frequent visits to customers, such as consultants, servicemen, etc.

Finally, telework is a means of establishing distributed teams of workers, whereby employees are geographically dispersed, but stay and work in the same virtual space. They can watch the results of each other's work and communicate in real time by means of various kinds of media: email, chat, telephone, videoconference, etc.

From the legal point of view, telework can come in various, more or less flexible forms: it can be provided pursuant to a standard employment agreement, or to an assignment contract. The employee can also be self-employed and provide telework on the basis of a trade agreement between his/her own company and the employer's.

11
These forecasts were used for reference only, because their time span is rather short.

12
European Information Technology Observatory (EITO) 1998 Yearbook; Status Report on European Telework. European Commission, 1998; Status Report on European Telework — New Methods of Work. European Commission, 1999; eWork, 2000 Status Report on New Ways to Work in the Information Society. European Commission, 2000; 2001eWork, 2001 Status Report on New Ways to Work in the Knowledge Economy. European Commission, 2001.

Telework does not have to be, and usually is not, the only type of work of a given person. It is usually accompanied by traditional, local work, although the proportions between the two can vary, depending on a variety of circumstances. Telework can be done occasionally, if the employee uses email to contact his/her colleagues, partners, or customers only from time to time, but spends most of his/her time working locally. A good example here is the work of a personal assistant, who is locally at the disposal of his/her boss, but spends some of his/her working time on tasks carried out remotely, such as contacting clients through the net.

Telework can account for the bulk of one's workload. More and more frequently, this is the way legal advisors work. Following a meeting with the client who presents his/her problem and specifies the task, further contacts are done remotely. This includes the results of an advisor's work, e.g. subsequent versions of a contract sent over the net.

Finally, telework may be a fundamental form of one's work. This often applies to IT specialists, who can access any computer over the net (as long as they have the required authorization). In this case face-to-face meetings and local work are incidental and they serve the purpose of creating a common culture in a company, meeting one's colleagues, etc.

The degree of formalization of telework also varies. If the internal regulations of a given company necessitate personal presence, then telework provided from home during the company's duty hours is formally illegal. Telework can be provided informally, if one's superior agrees to that. Telework can be formally approved of by the employer with respect to selected employees. Finally, it can be formally approved of and included in the corporate organization chart assuming that some employees work locally, and some remotely.

Similarly, there are several degrees of support for telework. Telework can face opposition by local employees, who perceive teleworkers as a competitive threat. Elsewhere, telework may be unassisted, and employees who provide it are left to their own devices. Sometimes, they are supported by the good will of local employees. Finally, it can receive assistance and support from ordinary employees as well as those appointed especially for this very purpose.

The degree of acceptance of telework by the employees can also vary. Telework can be unwelcome by employees who would prefer to work locally. In some companies it can be something unique (e.g. it can be exclusive to IT specialists). In others, it can concern a minority of employees, e.g. in a production company, where – for obvious reasons – it is limited to administration and management. Finally, it can be omnipresent, which is the case of high-tech companies, the companies of high management culture, and companies manufacturing intangible products.

Telework can be imposed onto an employee as a condition of employment: those who do not accept it, do not get the job. Employees may also have the choice: to work locally, or to work remotely, in accordance with a general agreement made with the employer. Elsewhere, an employee may have the right to opt for telework in negotiations with his/her boss. Finally, some employees may have an unlimited choice, to be made any time. This is usually applicable to highly skilled employees holding important positions within an organization.

Telework benefits for companies

It is estimated that telework can cut down the costs of running an office by up to 50%, independently on its variant – telework provided from home, a telecenter, or a flexible office. It is further estimated that telework can boost productivity of employees by as much as 40%, because they use their time much more effectively. Generally speaking, telework allows for better utilization of staff's skills and experience, whose knowledge and leadership skills are no longer limited by geographical boundaries. Telework makes it possible for companies to recruit staff from a broader area, which translates into finding better specialists at lower costs. They can also outsource more tasks, which can further reduce functioning costs, if – which usually is the case – the services provided by external, specialized companies on a free market are cheaper than maintaining internal departments for such services.

Telework provides a company with an opportunity to cooperate with people of unique skills and competences who would otherwise be difficult to hire, e.g. people from over the ocean, who would not accept a given assignment if it involved time-consuming travel; not to mention the fact that many companies would not be able to cover the related expenses.

Telework makes it possible to organize a company around the most valuable workforce instead of the most valuable buildings. Specifically, it allows for employing the most competent persons in distributed teams, thus setting them free from geographical constraints.

Telework offers greater flexibility in scheduling and arranging work. Work is performed wherever, whenever and in whatever form it appears.

Telework benefits for employees

The main benefit of telework is that an employee is able to schedule his/her own work. A teleworker is not subject to permanent supervision by a boss who controls him/her and imposes his/her way of working. Teleworkers are free to decide when and how to carry out a given task. They are evaluated on the basis of the effects of their work, and not on their punctuality, looks, behavior, etc. Generally, telework results in greater responsibility of the employees, and – as a consequence – in greater satisfaction from work. Obviously, greater responsibility is perceived as an advantage only by responsible people, just as greater independence is highly valued by the independent. Sadly, it does not apply to all employees, but it is surely the case of ambitious people, for whom work ranks high in the hierarchy of life goals.

Remotely provided work is usually better paid than the same work rendered locally. Telework provides companies with significant savings, so they can allocate a part of these resources on incentive remuneration paid to employees. If telework is carried out from home, then computers and connections provided by the company can also be used by the employee and his/her family for private purposes.

Telework gives more opportunities to use employee-specific skills. What is important, it encourages the application of flexible methods of management, whereby the company's management dynamically prepares a list of tasks to be carried out, and the employees choose the most suitable ones to perform. The management must intervene only if some tasks remain unallocated. Quite naturally, the employees will choose tasks corresponding to their interests, capabilities and other specific conditions. Therefore, they can continually and flexibly shape their duties on the one hand, and constantly develop themselves on the other.

Telework gives the employees access to a broader and more diversified job market and makes them independent from jobs offered only in the area close to their homes. Thus, potential unemployment among teleworkers is largely reduced, and earning opportunities are greater. Analogously, the opportunity to shape one's own professional career is also increased.

Significant is the fact that teleworkers, especially if working from home, find it much easier to reach a compromise between professional and private life. They are not subject to a clear-cut division of work and domestic life, which is so characteristic for the industrial society, where from 9 a.m. to 5 p.m. the employee is subject to his/her boss and stays at work, and from 5 p.m. to 9 a.m. he/she can be wherever he/she wants to, in particular at home. Telework abolishes this division and offers flexibility, which – coupled with reduced amount of time wasted by commuting – makes it possible to find more time for oneself, one's family and friends.

Telework deployment

Remote working methods can be deployed progressively as new forms of work that benefit both the company and its employees. It can be introduced by asking the employees to choose whether they want to work locally or telework. Finally, it can be deployed by means of individualized employment contracts.

Enforcing telework can also be an initiative of the employees, who strive for greater flexibility, or as a result of their right to organize their own work. This is usually the case in companies where network use is intensive, and where the awareness of telework and its benefits is high.

The deployment of telework is not free from doubts and fears, both on the part of the management and the employees. For several reasons, managers usually show reluctance towards remote managing. First, they lack hands-on experience in such management. Second, they find it hard to believe that employees are capable of self-organization – many managers are deeply convinced that employees will fail unless they are specifically told what to do and how to do it. Finally, managers are used to evaluate their subordinates on the basis of their behavior at the workplace, and not the effects of their work. Another important factor is the generation gap. Managers who are in the position to deploy telework usually come from the generation whose IT skills are rather low. They hardly ever use advanced technologies, and if they do, they usually do not go beyond the simplest applications. Therefore they find it unreasonable to use these very technologies to manage work and employees on a large scale. They will usually find hundreds of reasons against telework deployment, carefully disguising their own incompetence.

Employees, when offered to work remotely, are afraid of being treated as second-class workers, as a result of being out of direct contact with their boss and colleagues. These fears evaporate as telework becomes an every day practice in a company, and as long as its management enforces the necessary integration policy. Another important factor is the fear of losing the status of full-time employee, which one has to replace by self-employment in one's own business. The problem of secure employment first arises in those companies where costs must be reduced at any price, e.g. as a result of a market slump causing decreased demand and greater competition.

Importance of telework

The importance of telework should be considered on a macro and micro level, both in terms of the social and economic dimensions. As far as the macro-social dimension is concerned, it is hoped that in the longer run telework will help to equalize geographical scattering of societies. Fighting excessive concentration of people in large agglomerations, which inevitably involves serious and ever-growing infrastructural and social problems, is one of the ways of ensuring higher living standards in the future. A society composed of small, friendly communities, living close to nature, but working for the global economy over the net may be a slightly idealized projection, although is possible. If this scenario works out most village inhabitants will not be producers of food but producers of information.

A more balanced repartition of work in a country provided by telework is the hope of those areas where unemployment is high. However, it is necessary to emphasize that the main bottleneck of telework deployment in such areas are the qualifications of potential teleworkers. The areas of high unemployment are usually underdeveloped in terms of education, so there is a shortage of people able to provide intellect-intensive services, especially over the net. However, telework may bring highly-skilled labor to such areas provided remotely by people from well developed regions, as big cities, which can stimulate local economy and create new jobs for physical workers.

Telework also provides some hope to be able to solve, or at least alleviate, transportation problems. Anybody who has ever lived and worked in a large city such as Paris, London or New York knows that inhabitants of such cities spend a significant portion of their lives sitting fruitlessly in their cars, going to and from work. Although big cities in Poland are definitely smaller, the same phenomenon begins to appear, due to the limited throughput of local roads. It is much easier to transmit bits over optical fiber than people over congested streets and roads. It is suggested that cars should be used for private purposes and not as a means of going to and from work. Such an approach would make it possible to significantly curb street traffic, with all its positive results.

The social group that intensively lobbies for telework are the physically disabled. For such people, this is a struggle for a decent life, therefore it should be fully supported and

Let us again take the previously used example of a world leader on the market of advanced technologies with a presence in over 130 countries.

In this corporation only a couple of years ago, the periodical review of business in individual countries had a form of a meeting attended by managers flying in from various, usually distant, parts of the world. All the related costs, both the direct and indirect, were relatively high as compared to tangible effects of such meetings. Today, this type of meeting has been almost completely superseded by videoconferences.

To that end, the company's headquarters and the seats of all regional branches feature purposely designed and equipped videoconferencing rooms. Of special importance is their specific, ergonomic furniture. A ring-shaped table can seat up to 30 people. Each person has a monitor in front of him/her, where reference materials are displayed and where one can connect one's own computer in order to show his/her files to other conference participants, both those sitting in the same room, as well as those located thousands of miles away. The local network of the videoconferencing room is connected to both the company's intranet and the Internet, thus enabling instant access to internal and external data resources as well as the exchange information among participants. Apart from wall-sized main screen used mostly for conferencing with a smaller number of participants, there are large LCD monitors located inside the table ring. They form a multi-angle structure, where images from regional branches of the corporation are displayed. The upper edge of the monitors is placed slightly below eye level line of the participants sitting around the table, which allows for a more natural interaction with persons in the room, as well as those present remotely. Some of the cameras are voice-operated: they automatically aim at the speaker and send his/her image to all connected locations.

Behind semi-transparent glass panes there is a control unit where a technician makes sure that the conference is of high quality and goes on uninterrupted. The entire facility is reminiscent of a modern military command center. As a matter of fact, many functions are similar.

Effective implementation of these and other information and telecommunication technologies in international corporations leads to tangible economic effects: the turnover grows, the prof-

Jan
Glifski

Telecenter in an international corporation

assisted. Also women fight for telework, because the strict division of daytime into working and non-working hours is especially cumbersome for them. In many cases it makes it impossible to find a compromise between professional and private duties. For women with small children telework is an excellent opportunity to preserve ties with their profession and the employer, as well as to develop intellectually and professionally, not to mention their sense of personal value and the financial aspect. As a consequence, when their children grow up, they do not have to face the barrier of returning to employment, which is difficult because of one's age, dated qualifications, etc.

From the economic point of view, it is of no importance whether a teleworker is disabled or male/female. What matters for the economy is that access to employees through the net translates into a growing supply of knowledge, skills and know-how, which is a crucial condition for economic development. Therefore, the question of telework should, first of all, be considered from the economic point of view, since it guarantees that wherever possible, telework can also provide solutions to social problems.

Society

5.1   Kazimierz Krzysztofek
Information technologies
and human development

The history of changes in human development shows that the overall culture of a given society has an immense influence on slowing down or speeding up the development rate, which will also be true with reference to the information society. According to the principle of the culture lag, if there is a change in the instrumental culture (tools) then the changes in other cultural areas take place with some delay. The length of this delay determines which societies lead and which lag behind. The ones that are able to come up with a functional adaptable culture will lessen this cultural lag factor. There is no doubt that success in the creation of the information society in Poland, will mainly depend on whether and when it will come up with a functional culture.

For instance, there is no coincidence that the developed Mediterranean countries have a lower ratio of Internet users per 100 inhabitants than Nordic countries. Yet, the human development level in France or of northern Italy are comparable to that of the Scandinavian countries. What determines this, then? Well, the anthropologists divide societies into high contact and low contact level societies. Low contact level societies still prefer face-to-face communication rather that a mediated one. The culture always influences the way the tools are used by the society and so it also influences the way we use computers and the Internet. If a given tool is vital for survival then the diffusion of inventions equalizes the imbalances between different countries sooner or later. Today, this is the reason why, no culture rejects the Internet as it has become indispensable. Nevertheless, there is always somebody holding the position of a the cutting edge in technology. For many societies or countries it is like chasing the horizon.

The process of informatization brings many questions. Can the level of informatization be treated as a benchmark of development? Is it a new stage in human development or a stage attainable only in developed countries? Do we witness a new phase of scientific and technological revolution (which according to some people is a continuation of the previous social processes) or is it the dawn of a brand new quality — a social mutation?

Can the cyber society significantly increase the development chances of those countries that want to accelerate or skip certain development stages? Without a shadow of a doubt as the diffusion of data communications technologies proceeds on the global scale, these technologies will become cheaper. This will lead, over a period of time, to a situation when, as far as information and communication technologies are concerned, there will be no peripheral countries, just as today there are almost no closed societies. Everyone will have access to the information highway. The key issue, however, will be that of how many people will be able to afford it.

The experience of many countries all over the world shows that the development of the information technologies on the global scale, or at least considering the present stage of the diffusion of the information technologies, develops and maintains the division into "the programming" (overrepresented in the world culture and business) and "the programmed" (having no access to it). The above phenomenon has been labeled the *digital divide*. Affluent societies create the information society, which include digital cities, virtual parks

and other miracles of the digital world. In the case of most of the other countries we may only talk about enclaves of the information society. History shows that the first impact of information technologies divides societies. The question is whether this is a temporary or a permanent phenomenon, perhaps lasting generations. There is no doubt that the changes in man's communication environment leading to the digital era, influence the conditions of human development. We are still unable to evaluate the extent to which it maintains or abolishes inherited hierarchies on the international scale.

Since the times of the optimistic Marxism and equally optimistic western modernization theories of the second half of the 20 c. (inspired by the philosophy of the Enlightenment) people have believed that every progress in the core countries shortens the development of the peripheral ones. This belief, although often questioned, is still popular. It is based on the assumption that the same (technological) factor of change applied to any other socio-cultural structures will bring the same (rather positive) social and economic results. Not so long ago it was a broadly held belief that, following the founders of the optimistic modernization theories, new technologies may diminish social distances to a life span of only one generation.

Today, such optimism seems less obvious for several reasons. We have rich knowledge concerning the mechanism of the diffusion of development factors in the industrial society. Yet, we know less about the same mechanisms in the information society. The reason for this is that, today, there are not many, if truly any, examples of a completely transformed information society. And with respect to the majority of the developing countries we can hardly speak of a general tendency of development of the information technologies, whatsoever.

On the other hand it is also true that many private corporations invest huge amounts in the latest technologies in the poorest countries, with know how, etc. being their sole property. Many of those countries which, for instance, lacked national telecommunications operators or RTV networks in the past, today enjoy "the profits of the late comer". The most up-to-date equipment is introduced there including digital telephone exchanges, fiber optic networks, the newest mobile telecommunication and digital broadcasting systems. It is hard to believe that in countries like Ruanda, Djibouti, at Maldives or Salomon Isles the telephone is 100% digital. Obviously, it has certain cultural and political consequences, namely, private international groups own new media. One can notice an immense activity of huge telecommunications and media companies all over the world. The governments are encouraged to introduce deregulation procedures, especially with respect to the information broad bandwidth infrastructure, cable networks, Internet providers and mobile telecommunication operators. With such technology on one's side it is possible to locate an international business anywhere, which may lead to an oversimplified conclusion that the division into the centers and the peripheries is fading. This postmodern way of thinking questions any development hierarchies within the growing international society. This may be true in future. Today, however, it is impossible, as information technologies put metropolitan centers of western countries in a privileged position.

5.2   Kazimierz Krzysztofek
Information society — risk factors

Data transfers create a global network — a nervous system of the world. Any country aspiring to participate in the global changes has to be a part of that system. The network of the information highways is nowadays as crucial for the survival of the civilization as the electricity, rail or road infrastructure. Revolution in data communications has both positive and negative consequences in almost all spheres of human activity.

The vision of the world as a self-monitoring organism with the information network being both the nervous and circulatory system, guaranteeing security and avoiding catastrophes, etc. is very attractive but is not free from risk factors. It happened many times before that when new technologies increased man's potential, for instance prevented disasters, they would at times, however, in fact, be the cause of such disasters.

We are coming to the end of the first decade of the mass application of microelectronics. It still concerns, however, only a dozen or so most developed countries, which serve as a role model for others. Today, no one can say what the computer generation will be like in 10 or 20 years from now.

Information technologies, like any other technology, may serve good and bad goals, and affect even the people living in the most remote parts of the world. What's more they may even affect the people who have not been born yet. There will always be many contradictory opinions on the information technologies as new technologies bring both winners and losers. It would not suffice to just look at traditional personal ethics in a new way. In fact, we deal here with a new dimension of ethics. A computer and the Internet are not only tools used for communication and data processing, they are also the elements shaping the structural framework of a social life and the new core of social order. Thus, devising a maximally decentralized computerization model securing the most freedom to all members of the information society is an imperative of our times. Only after fulfilling that condition can we seriously think of the information society as an antidote for the current and future civilization ills.

Fortunately, the progress in this respect is taking place in times when the attitude to the new technologies is not as enthusiastic as it used to be in the past and the inventors are under a scrupulous observation. The views as to the influence of the info-sphere on the society and man's spiritual environment vary. Therefore, we may note four main concepts which take into account the advantages and disadvantages, anxieties and hopes as well as chances and threats connected with the development of the information society:

- The first trend is optimistic, it emphasizes extraordinary development opportunities (also with respect to the culture development), both for the already developed as well as the pre-information societies. Some traces of nostalgia for a better world and the belief in the favorable development of the civilization that is in progress can be found here. Such attitude in fact dates back to the Enlightenment. It has weakened over time, nevertheless it is periodically restated. Some say that for the first time since the invention of the printing press, which imposed a linear paradigm of perception onto the *homo sapiens,* the digital multimedia culture is in accord with man's natural multimedia perception. Thanks to that the digital culture leads to an unprecedented development of individual education as opposed to the programming humans.

- The second trend stands in opposition to the first one as it warns against an increasing reliance on technology, the digitalization of individuals , and against what's often called the scientification of human survival, that is against the situation when man becomes fully dependent on the latest technologies and scientific inventions. For instance, for a person addicted to computer games all becomes a game. We may distinguish between the primary and secondary addiction: the first is a fascination with the omnipotence of technology. Whereas the second is an illusion of the escape from loneliness. Surfing the net and computer games are to many people substitutes of a real life. People who spend most of their time in front of a computer screen are timid and do not deal well with interpersonal relations. Thus, there is a real danger that consuming virtual reality will intensify escapism. So many people escape into their own digital worlds in order to shake off the confines of the mundane — real world — or just to experience an illusion of such an escape. The first addiction gives the feeling of power, the second may suggest that one is a victim of "dark forces". Virtual reality technology enables one to do things that are impossible in the real world. The second trend is characteristic for the anxiety that human communication may actually be reduced to the man-machine interaction.

- The third trend assumes that the social outcome of the development of IT depends on whether the tools are used with good or bad intentions. IT itself is neither good nor bad, and it is up to men as to what purpose it will serve. This opinion is quite common, mostly because it is close to the "golden means", considering both the arguments for and against IT. This concept could be accepted, however, it is based mainly on the subjective factor. It approaches the problem only from the perspective of good and bad intentions as well as man's responsibility for creating the tools over which he has lost control. The concept is also not very convincing due to the fact that our lives have been greatly determined by the technology which becomes a part of us and breaks into our spiritual environment. For decades, people tried to adapt

the rapidly developing technology to a human dimension, which manifested itself in the evaluation of technology. Today the situation is reverse. It is us who have to adapt to the technology and change, if and whenever necessary. As has been shown by the investigations as to the causes of technological catastrophes, in majority of the cases, it was the human factor that failed. It leads to a simple conclusion - men have to develop. Such prognoses incite, although rarely, revolt of a neo-Luddite, which may turn into criminal acts, which was the case with Ted Kaczynski — the author and the executor of the planned elimination of people who introduce new technologies.

- The fourth trend, which seems to be most popular, is based on the conviction that the way we use the new information technologies only partly depends on us and is also determined by the nature of new technologies themselves. Indeed, the structure and the nature of new technologies determines to a considerable extent the way we use them. On the other hand, it depends on the creators and the consumers of new technologies which approach will be more popular — one based on activism or determinism. Whether we will be able to avoid or minimize the drawbacks and maximize the advantages of the development of new technologies depends on us. It is also up to us to what extent we will act "against ourselves"[1].

Which anxieties and threats will or will not come true? This is a question concerning the risk that the information society has to take. Looking at social development from the point of view of risk factors we may conclude that the pre-industrial civilization was "the sum of small risks," each of a possible scale of damage comparable to a breakdown of a small workshop. Due to the dispersion of such small risks, the overall risk for the whole civilization was lower than it is today in the era of enormous technological systems and networks. The industrial civilization through the creation of huge systems becomes autonomous and brings about huge risks which are determined by the level of the consumption of matter and energy production. It may be stated that the information civilization is a "megarisk." In 1999 the world went through the trauma of a millennium bug (the possible breakdown of the global information system as a result of not accounting for the year 2000 when devising the standard of computer data format). The costs connected with the reprogramming the computer systems were enormous. An additional risk is connected with domination or monopoly of one system (e.g. Microsoft software, Windows system, in particular). We can compare this to the monoculture of one variety of potato in Ireland which was destroyed by one plague. Such a risk is feasible as the inventiveness of hackers, infecting computer networks with viruses which are more and more intelligent and difficult to fight, is growing. Thus also in the global information society we observe the everlasting struggle between cops and thieves.

5.3   Kazimierz Krzysztofek

Development scenarios of the information society

The question concerning the future development of the information society has been asked many times. It had also been asked by the inventors of first computers. New technologies increase the speed of change, not in so much as the time span between the invention and its implementation is short, but rather due to the fact that they influence other areas: politics, economy or culture.

Non-linear development over a relatively short period of time is characteristic to the domain of the information and data communications technologies. It does not allow for the full adaptation of these technologies, their gradual diffusion and the avoiding of side effects. Today, we have to deal with the combination of social effects of a simultaneous implementation of new generations of the information technologies.

The societies of the future generations will be of a new quality. Let us mention here a few historical analogies. America has become a different country after the introduction of

1
K. Krzysztofek, M.S Szczepański, Zrozumieć rozwój: od społeczeństw tradycyjnych do informacyjnych [Understanding the development: from the traditional to information societies]. Wyd. Uniwersytetu Śląskiego, Katowice, in print [in Polish].

television. Europe was not the same after the invention of the printing press by Gutenberg. For example, the fact that Copernicus, Brahe, Keppler, Decartes, Galileo or Bacon wrote their memorable works in the 16th c. is undoubtedly connected with the invention of the print. Will the Internet create personalities of a similar rank or will it give rise to a collective intelligence, which, according to some visionaries, will level off people's mental potential[2].

We are still caught in a civilization inter-epoch, the pendulum of changes passes through the midpoint between the old and the new. This is a very intellectually fruitful time for us all, as the old and new technologies interact. The shape of the information society is not yet fully determined.

The Internet was still emerging when, at the beginning of the 1990s, that is shortly before the invention of hypertext and the "web", people reflected on what the organization of the society in the computer and network era will look like. Today, one can find thousands of works and essays concerning this issue. They present four different scenarios of the future development of the information society characteristic for different levels of optimism. They refer mainly to the USA but they also take into account other parts of the world along with the progress of the informatization of different nations.

The society of the end of democracy: there will be no restoration of democracy, especially with respect to anticipative democracy, societies will evolve as long as they do not become mismanageable.

Disciplined society: super strong, centralized governments authoritatively disciplining societies, growing control over the citizens, suspension or serious suppression of many individual rights considered today fundamental; hampering civil initiatives (which are the examples of anticipative democracy, hence also hindering electronic democracy, which involves an active approach). In other words, it is a scenario of the erosion of the civil society.

Society of the democratic continuation. This scenario extrapolates hitherto existing trends. A new infrastructure of the electronic democracy will substitute the old one, representational democracy will be maintained, political systems will remain stable, and the impetus for changes will, however, be faint. Information technologies will be broadly used mainly for military purposes and in business, including the culture industries; politics will remain relatively conservative. The society will remain horizontally and vertically mobile, well-off and liberal. It will still focus on education and technological progress, it will create equal chances for all individuals and increase the extent of leisure time. This vision, as can be seen, predicts the continuation of an enlightenment model called " traditional modernism".

Transformation society with technology as a driving force, will be in the state of a permanent transformation, expected and anticipated, though – with a plan of adaptation to new technologies which will safeguard it from the shocks (which induces reactive adaptation, that in fact focuses on survival — not expansion). What today is the latest breakthrough in the information technology will tomorrow be the standard personal equipment. Governments will gradually facilitate the citizens' participation in political affairs. The society will not be mass-oriented, it will be individualized and the information will be the major commodity, accessible to everyone. The access to the information technologies will be almost unlimited. An individual will be the nucleus of the society. The increased freedom will manifest itself in that lifestyles considered previously as deviant will now be tolerated. Culture will be responsible for offering values that will guard from ethnocentrism and intolerance, and will be useful in the process of adaptation to the market and open society. Such culture will have therapeutic values, it will teach openness, living without prejudices. It will incite the need for achievements, orientation on future without dwelling on the history in order to find out what factors have led to the present state of affairs over and over again[3].

The fourth scenario which was forecast some dozen or so years ago seems to be closest to the present state of affairs of the politics in the information society. Its proponents did not label it as postmodern. Today, however, we may say that it greatly resembles the model of the postmodern society. On the other hand, due to the escalation of the acts of international terrorism over the last couple of years, the material, personal and symbolic transfers may substantially reduce within societies and also on the global scale. Moreover, if technology is to play the major role for the transformation society, a question may be asked whether it will not lead to the inversion of culture. In the past, culture was more important than the tools, today the tools — media in particular — come to the fore.

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N. Postman, Technopol. Triumf techniki nad kulturą [The triumph of technology over culture]. PIW, Warsaw 1995 [in Polish].

3
T. Becker, R. Scarse, Teledemocracy emergent: state of American art and science. In: B. Pervin, M. J. Voigt, Progress in communication sciences. New York 1993.

5.4   Tomasz Goban-Klas

Information society and civil society

The goal of this short analysis it to consider the relationship between the civil society and the information society as two notions that are not synonymous. By the "civil society" we mean a society composed of individuals as well as smaller and larger groups active in the public life, which to a considerable extent are independent of the state and make independent decisions concerning everyday life. The civil society is also a model of everyday political culture – a model that focuses on cooperation, consensus seeking strategies and actions independent of the state or authorities. In other words, the "civil culture" and particularly the "civil attitudes"[4] are the conditions for the formation and the efficient functioning of the civil society.

There is no question (at least in the part of the world Poland belongs to) that the political system of the information society should be democratic. It remains an open question, however, what kind of democracy it should be. The chances for the implementation of the model of a direct democracy (used every day in a direct way) are low. Thus, there remains two other democracy models. The first is an up-to-date representational democracy, exploited by the representatives of the people who are chosen once every few years. The second is a future-oriented model of a deliberate democracy, based on the wide-spread use of new information and communications technologies, including the Internet and its future forms, for the purpose of a permanent dialogue between the authorities and the citizens[5].

Each model of democracy assumes four fundamental conditions with respect to citizens[6]:

1. Citizens are well informed;
3. Citizens are interested in politics;
4. Citizens have all equal rights to express their opinion and make decisions;
5. All decisions are discussed in public.

The political reality in the democratic countries do not comply with the above guidelines. Even in Great Britain, which is a country of an exceptionally long tradition of democracy, the attitude of the citizens is labeled as the "paradox of democracy":

"Even in democracies of long tradition, which served as a model for other countries, a disappointment with democratic procedures is a common thing. The people's trust in politicians in the majority of western countries has considerably fallen down recently. Less people vote, more people – especially young people, declare that they are not interested in parliamentary issues"[7].

Henceforth, the above guidelines must be inverted in order to reflect the actual state of affairs.

Thesis 1. Citizens are poorly informed. Two main information providers of public and political issues, namely, political parties and media, unsatisfactorily play their role. Political parties, which traditionally keep their members constantly informed (though biased), lose their main channels of communication including party meetings, press and publications. They were substituted by mass media which provide unbiased information and a platform for presentation of opinions and discussion. Nowadays mass media show a trend towards so called *infotainment* (a combination of *information* and *entertainment*) paying more attention to the attractiveness than the importance of the information. At the same time the number of political commentaries are being reduced. Some people openly accuse television of the demise of the democratic political culture. "In a thirty-second election spot there is place only for aggression, undermining somebody else's reputation and slogans which oversimplify and belittle all problems"[8].

Thesis 2. Mass media restrict information and political discussion as the audience, especially young people, pay less attention to political issues. Information reduction is related with the decline of people's trust in politicians and the disappointment stemming from their inability to put into practice their promises and political programs. The media (commercial

4
A. Siciński, Społeczeństwo informacyjne: próba nazwania naszych czasów [Information society: an attempt to label our times]. In: J. Lubacz (ed.). W drodze do społeczeństwa informacyjnego [Towards the information society]. Politechnika Warszawska, Warsaw 1999 [in Polish].

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B. Barber, A passion for democracy. Princeton University Press, Princeton 1998.

6
S. Splichal, A. Calabrese, S. Colin (eds.), Information society and civil society. An international dialogue on the changing world order. Purdue University Press, West Lafayette, Indiana 1994.

7
A. Giddens, Runaway world: How globalization is reshaping our lives. Routledge, London 2000.

8
D.J. Weitner, (djw@cdt.org) In: Słowo wstępne do elektronicznej demokracji [Introduction to the electronic democracy]. Graeme Browning, Mikon, Warsaw 1996 [in Polish].

media in particular) are reluctant to take up more ambitious or difficult subjects in order not to loose their audience.

Thesis 3. Citizens of a democratic country, although formally having equal right to express their opinion, do not have an equal access to the discussion platforms, that is to mass and specialist media. Therefore, in extreme situations, the street becomes the discussion platform where people express their opinions through demonstrations. Equal participation in decision making is, except rare incidents of referenda, an obvious illusion.

Thesis 4. The majority of the decisions made by governments and local governments are not even communicated to the public, not talking about public discussion on them.

The above theses show that the necessary conditions of democracy are not fulfilled. Civil rights are formally granted but impossible to execute. That follows mainly from insufficient political competence of the citizens unable to fully participate in a modern democratic system.

In the case of the industrial society the fundamental ability that made the social participation possible, including simple jobs and tasks, was the ability to read and write, and to understand simple texts. Likewise, in the case of the information society it is computer and media literacy. It includes the ability to use new information and communication tools and to understand multimedia messages. That is why many countries (for instance Great Britain) introduce media education in high schools or even elementary schools.

Despite the fact that modern democracies popularize high school education (which is necessary for a conscious participation in the social life today), most of the electorate have not reached the required level of education and knowledge yet, while a part of those who were educated a long time ago forgot a substantial part of what they have learnt. Moreover, a part of the knowledge they acquired is today obsolete. Even some people with university education have difficulty in understanding modern political phenomena.

Sociological data collected during the research for the OECD show that the level of functional illiteracy is higher in Poland than in other countries. More than 50% find it difficult to understand simple texts like promotion leaflets, news on TV, manuals or dosage info. This is why the use of a simpler language (not the language of bureaucracy, law and technology) to many official documents and manuals is so important. There are computer programs evaluating the difficulty of written texts, used for example in NATO armed forces. Also journalists, who are provided with the legal rights to access public information, have to be well trained to find, understand and later on properly present the information to the public.

A growing division of the "haves" and "have-nots" of the information has been identified by the European Parliament (see the report of the Commission for Economic, Currency and Industrial Policy of March 23, 1995). Considering the present state of affairs the importance to regulate the so called active right to information has become, according to some lawyers, a pressing issue. Creating fair chances for all people to access new technologies, securing a free access to information as well as its unconstrained distribution have all become crucial issues.

The access to information is significantly limited by the accessibility to mass media and the Internet. While radio and television are commonly available devices, the access to satellite or cable TV is still a privilege. Also the access to the Internet is restricted to a relatively small part of the society that does not enlarge dynamically.

5.5   Kazimierz Krzysztofek
Information society and democracy — Polish dilemmas

The experience of Poland and other young democracies shows that political changes are brought about relatively easy. The process of creating appropriate institutions is longer and a more complicated one. A glance at mature democracies shows that there are at least five conditions to be fulfilled in order to stabilize a democracy. The chances for establishing solid democratic procedures are small if:

- economic status discrepancy in a society is too large, particularly when vast social groups are deprived of the access to basic means;
- there is no tradition of democracy – also or maybe even in the first place, at the local level;
- education, including political education, fails to empower the citizens with the ability to choose from the many political programs due to their insufficient knowledge with respect to the political platforms;
- the social bonds are weak; there are no intermediaries, including associations, parties, social initiatives, etc., to fill the gap between the center of the system and an individual or social groups;
- political opposition is deprived of the legal status.

Only one of the above conditions, namely, the existence of a legal opposition, has a strictly political nature , and can be easily fulfilled, provided that there is enough political will to do so. The remaining are of either an economic or cultural nature.

The shape of the Polish democracy may be greatly influenced by the information and communications technologies. The influence of IT, telecommunications and media on politics is obvious. It suffices to take a look at the list on terms used to describe new phenomena: "wired democracy," "teledemocracy," "telematic democracy," "technopolitics," "cyberpolitics," "virtual politics," etc. If technology is to play the major role in the information society, we should ask, whether it may lead to the inversion of politics. In the past politics used to be more important to the tools it used, today the tools – media in particular – play the most important role.

Most domestic prognoses concerning the development of technology focus on the following: what the life will be like, how the people will exist, communicate, create, etc. Little attention is paid, however, to how they will govern or how they will be governed and to what extent they will participate in major (nation-states), smaller (regions) and smallest (local) communities. More attention needs to be paid to such problems like how the media revolution and the development of the information and data communications technologies will affect the mechanisms of democratic institutions, elections being the major democratic instrument.

Media have long been regarded as the fourth power. It seems highly probable that the new media, based on computers and computer networks, will become the first one . For example, the presidential election in the USA in 2004 or 2008 will be probably organized with the use of the Internet. If so, the election will acquire a new important attribute: it will become mediatized. We may expect that a similar process will also take place in Europe and Poland.

Relationships between democracy and the information technology are self evident – democracy is primarily based on communication. Today it concerns the countries with developed information infrastructure, but anticipating the process of the diffusion of technology we may claim with high probability that it will also concern other, modern democracies. It is beyond question that the information revolution influences both the process of decision making (the decision-maker has access to a greater amount of information than was the case in the preceding era) and the communication between citizens and the authorities (particularly local) differs in manner, quantity and quality. There emerge "digital cities," where the use of computer networks is no longer merely an experiment. They incorporate a direct and mutual communication between municipal or regional authorities and the citizens in *cyberspace*. This is possible only in the countries with developed telecommunication infrastructure where houses are equipped with computers, which together provides an unconstrained access to the Internet. If there is no access at home, it is provided in public "cyberkiosks" or "cybercafes." Today's "telopolis" already offers such a technology.

Optimists claim that the concept of anticipatory democracy (the authorities inform citizens of their plans and citizens, in turn, express their opinions on them) is today a reality. They claim it is akin to a permanent referendum, a direct model of democracy implemented on the local level. The Internet gives a feeling of power, decentralizes social structures, abolishes the concept of a mob, mass, people, and it changes the notion of a nation.

It is, however, too early to determine whether it is a renaissance of a direct democracy or its mutation Hitherto existing evidence of the western European countries and the USA show that it is hard to speak of electronic democracy on the central level of the system.

The fact that a president, prime minister or state secretaries receive millions of e-mails does not have any significance itself. Undoubtedly, it provides huge possibilities for *lobbying*, on the scale much greater than has ever been known before.

Media politics leads to the transformation of political organizations, election campaigns and other political instruments. The engagement of media makes a comprehensive scale of political action redundant.

Promotion of the individual freedom in post-mass society ("be yourself") leads to such a diversification of interests that traditional political institutions are not able to represent big social groups. This, in turn, makes the establishing of political platforms for multimillion groups of electors impossible, due to the diffusion of ideas, opinions and interests. Stratification of people and addressing only chosen social groups result in the disintegration of the national public and the nation in general, as well as in the loss of its codes and symbols. Great social movements are more often replaced by media or Internet campaigns. The future role of the Internet will mainly depend on to what extent it will remain a global public agora and to what measure it will be commercialized or monitored by the authorities? There is a multitude of unknowns here.

There is yet another threat – data communications bolster direct democracy but also improve the ability to program groups of electors. Telepolitics through the promotion of so called grass-root democracy, based more on self-representation than any real representation, may undermine the significance of representational democracy. The sovereign nation ("We the people...") undergoes fragmentation into distinct groups, whose socio-political and cultural characteristics are stored in databases and are known by the organizers of election campaigns. In such a situation the sovereign nation no longer controls the elites who can be replaced in the electoral process. It is a situation when the elites fully control the electorate using electronic media[9].

The sovereign people can be easily explored sociologically due to sophisticated methods and techniques of identifying interest groups. This is a problem of all democracies. Karl Popper warned that it is not enough to chose governing elites through democratic elections in order to secure the survival of representational democracy. It will be endangered as long as we are unable to chose the elites that can program the society. These elites are composed of media and multimedia tycoons today and their empires are either inherited or sold on the market.

Here, we reach one of the main problems connected with politics. It refers to the ways of stimulation and development of active participation in social life. Public matters concern all people, therefore, partaking should be understood here, not as the right to the politics as a spectacle, but as access to information. This makes public institutions in charge of a "fair" distribution of knowledge and information. The right to communication, including telecommunications (modem), is as fundamental as the right to education or culture. It's not only about being informed. Communication implies both receiving information and expressing one's point of view.

According to some researchers, technology, due to its interactive character, pays back politics for the period when technology opened it to the masses by means of huge centers reaching huge audiences with the same messages. This statement is, of course, far-fetched, as statistically the majority of people in the industrial and post-industrial countries do not expect an individualized offer and they satisfy their need of choice just using a TV remote control.

Should Polish democracy assimilate with classic institutions and representation procedures or "take a shortcut" and adapt to teledemocracy? It might be asked whether the expansion of information technologies when not accompanied by enough experience and need of political participation, will make it at all possible to go through the stage of democracy, based on active participation? Will such democracy involve real participation or will the new technologies transform it into a "yes-no game", thus producing political "videots".

Whatever tele-democracy is or may become in the Poland, it is undoubtedly a new quality. We witness rapid transformations in all areas of life requiring adaptation on the part of the people and the institutions. *Info-tech* means control, effectiveness, usefulness, speed and power – these sound, for the majority of people, unfriendly. Teledemocracy in Poland may sound like a fairy tale today but undoubtedly will not in future. This is why the question whether the development of teledemocracy will give rise to intelligent societies or only intelligently governed ones is so important.

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K. Krzysztofek, M.S. Szczepański, Zrozumieć rozwój: od społeczeństw tradycyjnych do informacyjnych [Understanding the development; from the traditional to information societies]. Wyd. Uniwersytetu Śląskiego, Katowice, in print [in Polish].

5.6   Tomasz Goban-Klas

The state and information

Anthony Gibbens, a British sociologist, points to the fact that when we talk about society we actually mean "nation-state". The nation-state is conceived as a restricted geographic area subject to a common political power. Information plays a very important role for such a state and this is why such states are in their nature the "information societies"[10]. States need to know their citizens (as well as non-citizens), their resources (planning and administration) and power potential (control).

The world is composed of nation-states, the fact best expressed by the United Nations. That is why today we still deal with no world citizens but rather different nationalities: the Polish, the British, the French, etc. The primary role of the state is to preserve the integrity of its territory. Therefore, the readiness to war is the fundamental responsibility of a modern state. Nation-states emerge as a result of wars and are preserved through huge expenditures on defense and war. Such states need to know the exact statistics of recruited soldiers, they need the weapon of propaganda and an army able to use information technology to fight. John Erickson claims that: "new military actions do not only involve weapons (...). They also greatly depend on information, commands, monitoring and control. Information move objects, shoot, control weapons. Signaling is fundamental. If you want disarmament ... get rid of computers"[11].

A modern state watches not only its enemies. It also monitors its allies, follow businesses and supervises its own citizens. The world we currently live in is organized to a greater extent than ever before. Our life is planned and organized by state institutions on an unprecedented scale. This does not necessarily involve the restriction of our civil freedoms, which have always been restricted by distress, hunger, plagues, wars, etc. However, it has to be stated that human freedoms are indeed being gradually restricted.

A modern state expects from its citizens readiness to defend it and to work for it that is to maintain the army and administration (compulsory draft to the army, the obligation to pay taxes). In return, the state guarantees its citizens political and social rights including: medical care, crime prevention, protection when abroad, retirement pensions, etc. The ambition of the state is to bring prosperity to its citizens, well at least to guarantee unemployment dole. For that reason it has to collect data about people who need help. A growing degree of state organization leads to a growing need of information about the citizens and the society. The knowledge acquired by the state is necessary to, first, understand and, next, satisfy the needs of its citizens. A regular surveillance is the basis of organization. Indeed, organization and surveillance walk hand in hand; they have developed along with the development of the modern world.

Surveying people is not a new phenomena. It was Adorno who first wrote of the administered society. Foucault presented social relationships as "prison ties". Finally, Max Weber described bureaucracy and "rationalization". The notion of information was, however, of a marginal value in their concepts. It was Chris Dandeker[12] who clearly stated that "the age of bureaucracy is also the era of information society."

The dangers of a growing bureaucratic surveillance are self-evident:
• too much information is being collected,
• privacy protection is reduced – both administration and companies have a far too easy access to the personal data that may be used for the political and commercial surveillance,
• the ambition of the state is to see everything (which alludes to the metaphor of a "house of glass" and panopticon).

Orwell's vision of the society surveillance, where cameras are installed even in private lodgings, is unsettling for many people. But there are also positive aspects to surveillance. It is necessary here to distinguish between individualization and individuality. Individualization is a process of identification of the person – through finding out his or her name, place of residence, lifestyle, etc. Individuality, on the other hand, means self-control and being a master of one's own life.

10
A. Giddens,
Nation-state and the violence.
Polity Press,
Cambridge 1985.

11
J. Erickson,
quoted from The Guardian,
11 November, 1982.

12
Ch. Dandeker,
Surveillance, power
and modernity. St. Mary's Press,
New York 1990.

Democracy requires individualization. Elections, for instance, require voters lists, checking who is entitled to vote, and who has already cast a vote. Thus, increasing political rights of an individual leads to individualization that is followed by the increase of surveillance. Permanent monitoring plays a great role in the functioning of modern organizations. In a traditional village, the social watch, that is the neighborhood watch was sufficient. The neighborhood watch is very inconvenient. It is alleviated by people's short memory – people tend to distort facts, they either sympathize or not with the persons they watch. It is important that this kind of surveillance ends when one leaves a local community. In modern societies, however, people's actions are monitored and registered in a permanent way, at least on a nationwide scale. People are under a continuous surveillance (with respect to crimes, loans or tax). Evading it is more and more difficult. Sometimes even emigration is not enough (e.g. in the case of credit cards debts).

The broadening of a nation-state, its involvement into the military and defense issues, the increase of civil rights and duties as well as the expansion of corporate capitalism, has, as a consequence, led to the expansion of the "surveillance society". It does not mean that we are living in a new kind of prison. The question, however, is: who holds the information control and thus holds power over the society? The more we know about other people, the more options of acting we have.

The surveillance of people by big international corporations is also a significant problem. Their marketing departments collect huge amounts of data concerning the citizens, not always to the benefit of the citizens. Since the introduction of "scientific management" by Taylor, managers are first of all employee controllers. Watching over the employees is one of their main tasks. City societies are being monitored to an increasing extent. The information becomes more and more complex, in-depth and precise. It is stored in databases, analyzed, and cross-checked. Mostly, however, the information is processed to provide a statistical description of social groups and segments, rather than individuals. In some cases, such information reinforces a feeling of security. Public places like railway stations, squares, parking lots, streets and elevators are being more often monitored in Poland today. Permanent surveillance of the customers is an everyday practice in supermarkets. The above forms of surveillance are in general approved by the society.

The new media serve both the purpose of surveillance and control on the one hand, and social liberation, on the other. A dangerous concept of the "electronic observatory", i.e., a system of constant social surveillance, has come true today. Jansen[13] warns: "the wires have already been laid, the observatory acts automatically."

5.7 Kazimierz Krzysztofek
Freedom versus control

The Internet is a public agora which is not governed by just one authority, which guarantees its freedom, provides unrestrained access to information and increases choices. Today we are offered more opportunities for communication and interpersonal cooperation on the global scale than ever in the past, when they were rather limited to the local or national scale. Maintaining the model of a closed society is not possible today. Individuals become a part of the world of free exchanges. Today's societies are too complex for one central bureaucracy to control it.

Information technologies enable, however, a more efficient identification of individuals. The more identifiable an individual is the easier it can be controlled. Techniques of political marketing transferred from the world of business enable such a control. An individual, with his or her psychic profile, biological (sex, age) and cultural (ethnicity, education) characteristics, can be identified more efficiently today both as an individual and as a member of a social group (national, local, professional, etc.), also due to the research conducted by companies. Their databases comprise of more and more detailed information with regard to people's interests, CVs and preferences. This information is accessible both to state insti-

13
S.C. Jansen, Censorship. Oxford University Press, New York 1988.

Daniel
Wieszczycki

Personal data in the Internet — hazards and protection measures

Companies and institutions involved in electronic business process extensively personal data. Today in Poland, we observe a trend of extending the number of personal data to be protected by law, which is followed by extended legal obligations imposed on the companies and institutions having access to personal data. If these obligations are too hard, however, they may slow down the development of e-commerce because of personal data processing restrictions and high costs of personal data protection.

On the other hand, due to the uncontrolled processing of the data available on the Internet, any Internet user may face new, previously unknown hazards. Integrating the information about a given person stored in different places on the Internet provides enormous possibilities to draw up individual profiles of his or her behavior in different situations, consumer preferences, etc. In most cases the user in unaware of these profiles.

Personal data available via Internet that are the subject of processing may be of different kinds. Names and addresses are mainly stored by companies operating on the Internet, with the permission of the Internet users, who fill in an electronic form. These companies, as well as individuals who have their own web sites, may, however, without the knowledge and the consent of web page visitors, collect the information on their connections to different Internet sites by looking at the history of entries, and thus acquire additional information on them. The information collected in such a way may help to trace the location of an Internet user and the web pages he or she visits. Part of this information is currently protected by telecommunications regulations, however, it concerns only the companies providing telecommunications services. As a consequence, the information with respect to the Internet traffic may be legally stored by companies to which the telecommunications regulations do not apply.

Accessing a web site by means of a web browser is anonymous, which means that the owner of the site is not able to identify the users who visit his site. The owner may, however, identify the Internet address of the computer which was used to access the site. He may also find out all about the history of users' behavior while being connected to the site (information on the time when the connection took place, visited web pages, the chronology and frequency of accessing different pages, etc.).

Though the access to the Internet is anonymous, in some cases, it is desirable or even necessary to identify the fact of a re-connection to the site by the same user. This is achieved by means of small files, called cookies, which are automatically stored on the user's computer when he or she accesses the site. Besides the identification of re-connection, the cookies are used for service personalization based on the preferences of the user. However, from the technical point of view, the cookies may be used for other purposes related with data collection about users. Coupling the information acqui-red by means of electronic forms filled by the Internet users with the information contained in the cookies and the information collected while the user is connected to the site may be a great source of personal data, collected without the awareness of the users.

A separate issue concerns recognizing nicknames (which are a sort of code names) and e-mail addresses to be personal data. If there was no possibility to browse the Internet, the name of the user and his or her e-mail address would not be treated as personal data. However, the Internet can be browsed, so it happens frequently that knowing the nickname or an e-mail address their owner may be identified. Having that in mind, a new definition of personal data should include both the nicknames and e-mail addresses to the items protected by law. There are some exceptions to this rule, however: some e-mail addresses belong to legal entities instead of persons. Such addresses should not be protected, because personal data concern persons only.

Insufficient protection of the personal data processed on the Internet results, among others things, in the spreading out of spam, that is unwanted e-mails repeatedly sent in bulk to various Internet users, often containing aggressive ads. According to the survey published by the European Commission, Internet users all over the world lose USD 10 billion every year as a result of receiving unwanted electronic mail. This situation is brought about by insufficient regulations with respect to the accessibility of e-mail addresses. Some analyses of the European Commiss-ion present a view that acquiring e-mail addresses from commonly available sources like discussion groups and using them for the purposes which are not compliant with their primary purposes, in particular for distributing ads, should be treated as illegal. The problem has been noticed

tutions and private companies or media, etc. The process continues in spite of the fact that more and more attention is being paid to personal privacy protection issues as a result of the digitalization of today's life (e.g. widespread use of the mobile telephony, identification card and personal identification numbers (PIN) which store many coded personal details, maybe even a whole concise biography of an individual). Technology also increases control at work, making it easier to monitor employees (including mail monitoring, etc.). Our freedoms, thus, may soon be endangered not only by Big Brother (that is by governments or huge corporations), but also by smaller institutions or companies controlling our steps by means of ubiquitous TV cameras. Information technologies, by creating the space which is being constantly monitored, give birth to the transparent society. Digital technology is easily traceable. Yet we still do not have data coding systems that would be fully reliable. New, effective ways of personal data protection are sought after, for instance, with the application of biometry (it requires, however, collecting more personal information). Thus, there is a growing conflict between personal data safety requirements and civic liberties which manifests itself in the discussion on the advantages and disadvantages of GPS (Global Positioning System) or of other broadly used telecommunication devices[14].

The limits of freedom and control are today broadly discussed. The use of the Internet by criminals has induced governments to introduce a kind of Internet monitoring system (for instance like Echelon or Carnivore systems in the USA). Thus, we have today both the expansion of visible freedoms and the latent control. Decentralized forms of life and work may be accompanied by centralized forms of bureaucratic control. Democracy depends on the access to information, however, due to the fact that the world becomes more and more complex, more and more information is produced. This complexity accompanied by the profusion of information makes the discovery of truth, or establishing one's own point of view, more and more difficult. A growing amount of information concerning the world is mediated by mass media, as opposed to wisdom, which should be gained by an individual as a result of his or her life experience and not by mediated media views. The main architects of today's media world are more interested in using IT for the benefit of a consumer society rather than a civil one.

At the beginning of the new century, the relation between media and personal freedoms, is rapidly changing. During the era of old mass media, which centralized societies, the stress was put on a personal right to information. Today in the era of interactive media with the profusion of information sources as well as ubiquitous media, a personal right to privacy becomes more important as we may easily be subjected to new forms of control available to those who use these technologies.

5.8   Tomasz Goban-Klas

Internet contents control

Internet communication is characterized for being very easy to conceal one's identity as well as the time and place of the operation. Internet technology encourages multiplying different information contents by anonymous authors, while it makes it easy to identify information receivers (though, they may also use social masks). Thus, it reverses the traditional model of mass media communication in which the sender is known and the receiver unknown.

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K. Krzysztofek, M.S, Szczepański, Zrozumieć rozwój..., op.cit.

At the same time it is obvious that the Internet, due to its immense volume (more than a half billion of documents, billions of e-mails, billions of web pages, millions of chat rooms, etc.) and its transboarder reach, is a perfect place to harmful and damaging acts which are hard to identify, trace and eliminate. The growth of the Internet increases the potential of its influence – both the positive and negative.

Thus, the Internet that is a huge worldwide telecommunications network providing diverse services, requires closer monitoring. This statement sounds to the Internet users as an ominous prelude to the censorship of the Internet. This, however, is not a case. Censorship is in fact an arbitrary and discreet elimination of some information or works by the authorities (secular or religious) before they are published. Something different is a legal prohibition on promoting certain ideas or information. In such case the decision is a result of lawsuit based on generally known and precise legal and constitutional regulations. Yet another case is the social control prohibiting the access to certain information contents (e.g. movies prohibited under 18), or self-control of the information contents producers (e.g. respecting moral rules, avoiding vulgar language, etc.).

Apart from a strictly political and legal aspect (civil freedoms), the problem of the Internet contents control concerns at least a few other aspects: the international one (**WHO** is authorized to control the contents?); the semantic one (**HOW** to define children's pornography if the virtual reality enables to create scenes without real actors?); and the cultural one (**WHAT** is determined to be improper, harmful, etc.). After the unconstrained development of the information contents on the Internet, in some countries (e.g. Germany) the state attempts to impose the control. It seems, however, that the pragmatic and liberal approach to the Internet contents control will dominate. It is true for the USA, which for various reasons is against breaching a free flow of information on the international scale, even if some restrictions are proposed in good faith and are well justified. In the seventies both UNESCO and the United Nations strongly supported the third world countries initiative on the "New information order" (it was also supported by the USSR and former communist countries). Its aim was to reduce the position of the American media worldwide and to provide a more balanced flow of information. The initiative was, however, rejected by the USA, which withdrew from UNESCO. Also the European Union, despite its efforts to protect its own cultures, will not oppose the USA.

Nevertheless, even the most liberal country in the world – the USA – passed the Communication Decency Act in 1996, which imposed certain contents control obligations on the operators (it is worth reminding here that the postal service in the USA censor mail to some extent – for example, it is banned to send prints considered harmful, like pornography, or enemy propaganda between the states.). In June 1997, however, the Highest Court of Appeal abolished the Act, deeming it contrary to the constitutional freedom of the word. At present more emphasis is put on self-control of Internet contents providers and parental control (so called V-chip, V for violence) of the contents available to children.

The concept of the Internet as a free and – let's admit it – anarchic medium, emphasizes the advantages of its unconstrained use. However, further development of the Internet requires improved reliability and new security measures. If the Internet is to become the realm of e-commerce and e-banking, it has to guarantee the security of transactions. This requires a number of security measures including digital signature. High quality of the network and high credibility of documents and information is followed by the limited accessibility – at least by reason of paid services. However, the issue of the security of Internet business transaction is not the subject of our interest in this Chapter.

Our interests are focused on the problems of the safe Internet use the by children and teenagers. The threats or even the crimes they fall victim to are of a different kind than losing money or unreliable transactions – although such incidents are important and frequent. The problem concerns an easy access to harmful contents provided by the Internet to children and teenagers, which cause a hazard to their proper spiritual and sometimes physical development. Pornography comes first here. This is, however, only the tip of the iceberg. The problem of the contents reinforcing negative stereotypes (e.g. ethnical), promoting racial segregation, national prejudices, etc., is also very important. Some of such contents can be classified as criminal, others as harmful or at least as undesirable. There are also other problems that follow from a pseudo-personal character of the Internet communica-

tion by e-mails and chat rooms, as well as mobile phones and SMS (Short Message System). Each of these areas requires individual treatment.

There are two opposite approaches to the problem of harmful and undesirable contents control in the Internet. The first one refers to traditional censorship and is based on the contents (words, images) filtering (which is done by means of a specialized software). The second is based on self-regulation. It involves marking the contents as undesirable (improper, harmful) for specific groups of users (which is close to film rating used by television). The second approach involves cooperation of the authorities with the Internet service providers (ISP) as it requires the analysis and rating the contents stored on their servers.

The USA is the pioneer of Internet contents regulation, as it was the pioneer of Internet design and deployment. Although the situation, also the legal one, is changing (some acts that passed in states are then abolished by the Highest Court of Appeal), many actions have a real impact on the Internet service providers and the way the Internet is used.

On October 16, 1996 the European Commission published a statement entitled "Illegal and harmful contents on the Internet", where "a highly decentralized and multinational nature of the Internet" was emphasized, and "coordinated reaction on the international and European level" was recommended. The Commission rejected any contents control system based on blocking the access to Internet sites complemented by blacklists of sites or Internet pages, claiming that "such restrictive system is unacceptable in Europe as it would severely violate the freedom of individuals and political traditions." Moreover, such system would be against the rules of the free market.

The Commission is in favor of filtering software installed on personal computers, which enables parental control. It is a pragmatic solution which can be adapted to different models of family and national sensitivity with no harm to the free flow of information.

By encouraging the European contents and software providers to "form a common platform for the implementation of the filtering systems within the European Union" the Commission tries to convince them to accept their ethical codes and to start the process of self-control through the proper "signaling" procedures.

On December 31, 1998 the Council of the European Commission accepted the agenda on the promotion of the secure use of the Internet through fighting harmful and illegal contents in global networks.

Four main actions were planned:
• creation of a safe environment (through the self-control of contents providers),
• the development of the filtering and rating systems,
• supporting the growth of people's awareness,
• additional supportive actions.

In the case of illegal and harmful contents it is necessary to find a right proportion between the means protecting the free flow of information and those guaranteeing proper safeguarding measures, with respect to children in particular, who must be protected from aggressive forms of marketing, violence, pornography, etc.

The Internet Watch Foundation (IWF) in Great Britain is an example of the self-regulation described above. It was founded by Internet service providers (UK ISPA), professional associations (London Internet Exchange) and the police. It is supported by the British government and private institutions. The primary aims of IWF include: preventing the exchange of illegal contents in the Internet and providing the users with the programs and tools enabling them to protect themselves and their children from harmful contents or contacts. It turns out, however, that the majority of unwanted contents come from the outside of the United Kingdom. Hence the urgent call for an international cooperation.

Poland, at least due to its aspiration to join the European Union, cannot ignore the negative aspects of the development of the Internet (and similar media) in its programs concerning the development of the information society. So far, only positive aspects have been highlighted in the official documents (e.g. *e-Polska* – published by the Ministry of Telecommunications in May 2001, *Polska w drodze do społeczeństwa informacyjnego*, published by the State Committee for Scientific Research (KBN) in November 2000, analyses by the National Radio and Television Broadcasting Council (KRRiTV), Reports of the Congresses of the Polish Informatics). Unfortunately, no hazards are identified and no legal, ethical or education forms of content control are considered. Even the Interkl@sa Program does not incorporate the teaching on the Internet hazards and filtering programs.

5.9　　Kazimierz Krzysztofek
Cultural aspects of the information society

A new social class called the elite of knowledge — *cognitariat* — which professionally deals with collecting, creating, processing and distributing information is becoming the new driving force of the information society. The ability to use a computer and the Internet becomes essential for the members of such society, and is today as important as the ability to read and write with respect to former generations of developed countries. Competitiveness of a nation will be directly proportional to its learning and inventive capacity. The elites and countries which are not aware of the above, and as a consequence do not provide their members with proper conditions for the acquisition and processing of knowledge, run a risk of loosing the most talented and dynamic individuals, who will easily find attractive job offers abroad. Brain drain has always been disadvantageous for the countries who fall victim to it, and today its negative consequences can be enormous.

The influence of the public sector on the society is being reduced which also reduces its control potential. Politics and culture seem to be no longer the subjects, they become the receivers, the customers. If knowledge and the quality of the human factor play the most important role then the imperative to compete in today's globalized and informatized world requires this human element to constantly improve in order to meet new requirements. The quality and the total sum of intelligence will decide whether a given country will be among the leaders or the followers. Thus, there is a need for better programs and mechanisms generating the information and the knowledge, which are not stored in computer memory but are a result of its content. In other words, we are talking here of intelligent programs, self-educating artificial neuron networks, reasoning engines, etc.

The new job standards accepted by the Polish society during the information era will mainly depend on the response of its culture to the processes of globalization as well as European integration. These interconnected processes become a potent socio-cultural transformation factor, which will deeply alter, and in fact is already altering the mentality of Poles.

The history of great social changes accompanied by culture impacts shows that there are many scenarios concerning the response of the old culture to the new one. Let us mention some of them:

1. Full acceptance of the new culture — a complete adaptation to the new cultural conditions, based on a radical departure from the past, particularly popular among the younger generations, which are brought up in the circumstances of radical social and cultural changes. Young Poles, university graduates in particular, are able to adapt to and accept new forms of activity faster than other social groups and feel a greater need for achievement. Here we encounter the first sociological barrier, namely the difference with respect to the levels of the human capital of young Poles (being the sum of knowledge, education, individual talents and skills). People of a high human capital are likely to find employment in business areas which are in touch with the global information society. Institutions operating in the global education market, which developed rapidly in the nineties, are able to prepare people relatively well for the work in the global information society. They offer forms of education oriented on pragmatism, which is a response to the traditional value-oriented model focusing on general intellectual development. Such a pragmatic approach is necessary. We should remember, however, that it works well only with respect to routine occupations. Therefore, a compromise between the pragmatic approach and the system of general education is needed. It is vital in order not to reduce the level of general education particularly regarding the humanities, as it is essential for innovative thinking and creative problem solving. However, the modernization of the Polish education system focuses today more on routine occupations.

2. Rejection of the new culture, i.e. the lack of acceptance. This scenario refers broadly to education and generation-related factors, too. The age factor is obvious here — older generations adapt less flexibly to social changes as opposed to the younger genera-

tions. A high number of young people in Poland who are not adapted to rapid cultural changes is a negative phenomenon. This is related with their lack of proper education or such education which is not synchronized with the demands of the domestic and international market. This problem concerns mainly the system of vocational education, which is today a system generating high unemployment. Supplementary vocational training in not the right way to fight such a dilemma. Various state institutions are still responsible for providing, and should provide, good and up-to-date education at vocational school level. They, however, are not experienced enough and lack financial means vital for educating most desired professions. The private sector participates in such education programs to a small extent, although the system of corporate training sponsored by companies is quite popular all over the world.

Unfortunately, new generations of young Poles join the unemployed, which in practice, equals their exclusion from the working class hence acquiring the status of a subclass. In such circumstances the social adaptation has rather a reactive character mainly focusing on survival. It is not the model of an anticipative adaptation oriented on personal expansion. The role of a proper education is a key to the modernization of Poland, which is repeatedly stated by the political elites, both representing right and left-wing views, unfortunately to no avail.

The above scenarios are not the only ones that are probable in the Polish conditions. Let us mention two more. They are very interesting as far as cultural changes and the involvement of Poland in the global processes — namely hybridization and culture dualism — are concerned.

3. Hybridization — a kind of co-adaptation and convergence is a compromise between the old and new culture. There are two possible sub-scenarios here, the first may be called a positive and the second a negative convergence. Positive convergence is a merger of the functional elements belonging to the old and the new culture. Negative convergence is a combination of the worst features of the two cultures. It may be called the syndrome of the late-comer, who is fascinated with such inventions or aspects which have already started causing problems to highly developed societies.

It is worth taking into consideration that societies experiencing radical changes do not necessarily have to follow the example of societies which have successfully accomplished the process of modernization. Some societies stop developing at one of the development levels, which was believed to be only a transitory one. Any society may experience it and come up with its own, unique (which may not be good at all) model of culture. There is a hope that the young generations of people who are constantly in touch with the world will be able to successfully deal with the problems that arise over the transition period.

There is no one universal culture, even if we consider the culture of business, work or entrepreneurship, however, there are a number of universal elements common to all cultures (rationality, costs and revenues analysis and others). Today's economic culture is founded both on the already existing norms and values and on new, international standards. The onset of such culture is noticeable today in Poland. The question is whether such a hybrid model of culture will be creative (originating in a new quality in the business culture) or will it be a fusion of the negative elements of the Polish and the universal social and culture elements?

Modern corporations which operate on the global scale do not impose one corporate culture. The reason for that is not that they care so much for pluralism but they want to exploit people's creativity incorporated in various local cultures, sharing a belief that since these cultures have survived so far, it means that they will also prove useful in the process of adaptation.

4. Numerous works describing the processes of cultural adaptation to the new global information society also provide us with an interesting example of the **two culture levels**. This is the scenario of the most desirable impact of the global information culture and the already existing ones, which does not obliterate the national, ethnical or local cultures. Poles are affected by the global culture at the same time not deprived of the possibility to participate in their own culture. The global culture comes up with a universal communication code, which proves particularly useful when running a business in the multicultural world. Such positive dualism is characteristic for educated men and women who on one hand are competent in decoding symbols of the global culture and on the other hand

respect the values and symbols of their own national cultures. They are both attached to their own local cultures and, at the same time, they can easily adapt to other cultures, having no prejudice towards them. Thus, we deal here not with the hybridization but rather with two separate sets of values and models.

Thus, the scenario of the rejection (free or compulsory) of the new culture is mostly disadvantageous for Poland as it deprives people of the right to participate in the global information society and slows down the process of the modernization of Poland with respect to IT. The scenario of the acceptance of the global standards and the creative hybridization, are most beneficial for Poland. Considering the future Polish culture and identity, the participation in the two levels of culture appears to be most advantageous. On one hand it means accepting proven professional and entrepreneurial standards, as well as a popular philosophy of life focusing on creativity and activity. On the other hand it means preserving Polish authenticity and uniqueness which is a natural input of every country or society into the universal and global culture.

The international society as well as our closest European neighbors do not want to merge with the nation of a cultural inferiority complex. Poles must avoid both a blind fascination with the models offered by other cultures as well as an ostentatious hostility towards them. Most of all, however, the national culture has to be unique and strong enough to avoid degradation, which is tantamount to both failing to adapt to the new inspiring world trends and losing the national culture assets that accumulated over the centuries. Poles still need to determine which elements of their national heritage they want to preserve and promote and which, being no longer useful for their development, should be left out, even if such a process proves painful. The young generation, at least the growing number of its educated members, has already made such choices. They are future-oriented and do not repeatedly dig up the past in order to identify the causes of past tragic historical events. They start to realize that the times when an individual progress was determined by the societal progress of the whole nation or a particular social class are now gone. The future belongs today to the individuals who can find their own place on the global job market. An educated and a creative citizen of a developing country like Poland is more likely to achieve professional success abroad than his colleague from a more developed country representing, however, a less attractive profession.

It seems highly probable that during a long transition period the socio-economic and cultural structure of the society in Poland will be two-fold. People will be divided into two enclaves: that of the information modernity connected to world centers and that of vast social groups deeply rooted in the old culture and its socio-economic order. For that reason the social strata which is connected to the global information culture should cease to be an enclave. There should be a strong overlap between the two social groups and the positive results of the knowledge and information diffusion should involve the whole country and improve professional, entrepreneurial and management standards as well as creativity of all people.

Summarizing, in Poland, like in the majority of other countries, at present there is an intermingling of two cultures — the global and the local one. The second is, however, not connected to the first. The potency of the first one will influence the modernization level of Poland, the local culture still has a long life for millions of Poles, especially village and small towns dwellers.

The transformation period of the nineties in Poland has changed many things so far. The level of social and cultural changes was, however, varied. Poland similarly to other Eastern European transforming countries is a country of three transformation speeds. There is a considerable pre-industrial sector with its job ethics and culture characteristic for peasant ethos, commune bonds and a strong attachment to land. There is another — industrial sector — which was inherited from the past communist system. Finally, there is the third one — post-modern and post-industrial sector characteristic to a new job culture and ethics, based on freedom, auto-creativity, high technologies, computers and networks. This multifold character of society brings about previously unknown and unprecedented political, economic and cultural divisions and tensions.

5.10   Rev. Tomasz Węcławski

Societal changes in Poland and the Catholic Church

The situation and the tasks of the Catholic Church (proportionally — other Churches and Religious Communities) in Poland is determined by two major groups of factors. The first one concerns a religious identity and the inner situation of the Church as a religious community. The second concerns a changing societal and cultural situation, being a realm of the activity of the Church as an institution and formation.

It is commonly assumed that the inner, religious identity of a big, traditional, socially well grounded community like the Catholic Church in Poland, remains relatively solid and sound, while the outer conditions of its operation change. A consequence of such assumption would be a conviction that the core social mission of the contemporary Church consists in the recognition of those outer conditions, the trends of changes and future needs, and then undertaking the actions proper to the result of the recognition. This is, however, an oversimplification that may easily lead to serious misconceptions of both evaluation of the Church situation and tasks by internal Church institutions, and the evaluation of the current and future role of the Church in the social life by other institutions — social, cultural and political ones.

The present situation and a possible future social role of the Catholic Church in Poland depends on its inner religious identity, which is not as clearly determined as it is commonly assumed. This follows from a general (not exclusively Polish) societal situation of Christianity and the Church. The following problems arise:

1. Is the whole (broadly understood) catholic community aware of the changes and new challenges, and is it ready to face them?
3. What sort of spiritual leadership may be expected from the Catholic Church and its authorities in the present civilization situation?
4. What kind of spiritual leadership and what form of communications is potent enough to affect people in the conditions of societal, cultural and industrial globalization?
5. Can/should people expect an immediate reaction to current societal changes from the Church and its authorities, or rather a universal reference point that would enable individual persons and communities to remain spiritually independent of those changes?

There are no easy answers to the above questions, therefore, no one should expect the answers in the near future. Two factors make the problems even more complex. The first one that is fundamental concerns the transformation of the relationship between the national identity and the catholic identity in Poland. The second one that is occasional concerns the role played by John Paul II in the Polish Church. These two factors are closely interrelated — the way in which John Paul II is present in the minds of the majority of Poles clearly reduced the changes (unavoidable) related with the first factor. Therefore, based on the above interrelation and tensions, chances and disappointments caused by it we present below the essence of the societal challenges and tasks to be faced by the Catholic Church in Poland.

Changes in the civilization situation of Catholicism in Poland

A traditional form of the relationship between the Catholic and the national identity of Poles that was shaped during the partition of Poland in the 18th century and continued till the late eighties of the last century is exhausting. It was based on the defense of the national identity and culture against external dangers following from the political situation of Poland.

The fact that this form of the relationship between the Polish identity and Catholicism weakens does not necessarily mean that the relationship itself comes to an end or substantially reduces. It means that its traditional form is replaced by another one. Indeed, it seems that more and more practicing Polish Catholics (in particular the young and the mid-

dle aged) base their Catholicism on a more universal attitude. As a result they do not refer to the Polish history and tradition as distinctly as it was still the case a few years ago.

The problem is that at the level of spiritual leadership as well as pastoral activity and apostolic activity of lay people, this new — more universal attitude is treated without due attention. Still the old attitude and rhetoric dominate.

Yet, the movement towards "universalization" and a simultaneous enhancement of a conscious choice of faith may be a chance in the context of rapid societal changes in Poland. The reason is that the challenges accompanying the latest changes cannot be, in practice, responded to from the perspective of the old type of relationship between the national and catholic identity. It primarily concerns the challenges related with the informatization of everyday life, professional mobility, decrease of residence stability, and the weakening of the attachment to the environment, the land in particular. (The example of young generations of emigrants, who had earlier faced the challenges described above, shows that a former model of experiencing Catholicism enables the preservation of the "Polish traditions" and to cultivate the feeling of uniqueness. It, however, plays no role while choosing a lifestyle, education, profession, place of residence, etc.). The traditional model of Polish Catholicism is not able to guarantee fast and adequate response to new social, professional and cultural challenges, in particular ethical ones. People consciously basing their lives on the universal core of the Christian faith instead of relying on its superficial and customary form, are expected to be more apt to independently deal with these challenges. The universal core of the Christian faith may be presented as follows: *The Church is the community of people who accept the Gospel and believe in the crucified Jesus, who has risen from the dead, Messiah, the Son of God, Savior; and who believe that they are guided by its Spirit. The experience of Peter and those who were with him is the fundament of this faith. The word and the sacraments of salvation are the embodiment of the Gospel.*

John Paul II

Considering the above it is necessary to point out the influence of John Paul II on Polish Catholicism. He combines the attachment to the tradition of national culture (understood very broadly) with the reliance of faith and the vision of the Church on the aforementioned universal fundament.

The teachings of John Paul II and his example find many admirers in Poland, however, not many really creative and serious followers. The type of the spiritual leadership represented in the Catholic Church by him both with respect to the content and the way of communication, meets the aforementioned demands of globalization.

It seems, however, that a true understanding of the Pope's message is overshadowed by concentrating more on the person than his words. For many people the most important thing is that the Pope is so acclaimed all over the world as a spiritual leader. This approval is, however, not combined with the reflection on the sources of his authority, on its fundaments and the ways of communication with the people of different social groups, cultures, and civilizations, to whom the Pope's teachings are addressed. Therefore, we should expect a considerable shock that will take place when he is gone.

Social life: transformation of agriculture, unemployment, areas of poverty

The religious practices in the rural areas are rapidly changing. As a result, the significance of church institutions (parishes in the first place) is also changing. The transformation of rural religious practices will continue in the circumstances of rapid societal, industrial and social changes following from the European integration. The transformation mainly includes the processes of religious and cultural degradation as there is a lack of proposals of new forms of religious practices in rural areas suitable to the new situation.

The same phenomenon concerns the religious practices in big and small towns facing high unemployment rates or located in the areas of so called structural poverty (primarily related with the breaking of family bonds, alcoholism, drug addiction and the increase in the crime rate, mostly among young people). Also, these communities lack both feasible social welfare programs and new forms of religious practices as well as cultural proposals.

Even if some local initiatives appeared in last few years, there is still no systematic solution, based on the common understanding of the problem by the whole religious community and common tasks. The reason for that is the lack of accurate information as to the living conditions, the way of thinking, the attitude towards reality and the degradation of individual aspirations with regard to the people representing the communities afflicted with the negative processes described above.

Spirituality and religious practices of a younger generation and the language of a social communication

A lot has been done to popularize the teachings and the standpoint of the Church among the younger generation governing Poland (including journalists and other media people) – Catholic Information Agency, Internet services, PLUS radio, PULS TV station, other catholic media, the existence of theological faculties at state universities. However, the core of the catholic identity still remains incomprehensible to a major part of that group. Secondly, the official language of the Church does not suit the mentality and sensitivity of these young people. Last but not least, the number of feasible proposals concerning spirituality for those social group is relatively small.

Paradoxically, also in the case of this group, which might be labeled the "new Polish elites", the lack of spiritual or more broadly — religious proposals follows from the lack of accurate information as to living conditions, the way of thinking, the attitude towards reality and the aspirations of the individuals composing this group, similarly as in the case of the people from rural areas. This informational deficiency cannot be substituted by the image of this social group presented by the media, because it is superficial and distorted to a certain extent.

Education

Due to a rapid increase in the number of young people interested in education, including university education, it seems particularly important to tailor the programs, structures and forms of religious education (religious instruction, theological education) at all the levels to a rapidly changing situation. The tasks already undertaken are important, but relatively easy — updating the programs of religious instruction at schools, and transformation and development of the model of a higher theological education. Much harder tasks remain to define and perform. They concern the dialogue between the vision of the world originating from the Christian faith and the visions coming from other areas of education (originating from natural sciences, empirical sciences and social sciences) and media, in particular the new ones like the Internet.

Religious and theological education programs do not take into account the real cultural and societal diversity of the communities they are addressing. It leads to a low efficiency of that education on all levels — at least when it comes to the operational knowledge, really used in all areas of personal and social life. Though religious knowledge and the religious vision of the world frequently remains a significant part of the personality and the personal hierarchy of values, it is to a large extent separated from the real personal and social life.

Conclusion

A great effort has been recently undertaken to make the teachings and the works of the Church more prominent in the electronic media, especially on the Internet. We deal with a rapidly growing number of people who interactively use new technologies for religious communication. It may be easily noticed that the quality of contents, significance, influence and finally the power of social integration characteristic for such new forms of religious communication are determined, like in the case of other areas of social life, not so much by technology itself or people's ability to use it, but by the current social and cultural situation of the Catholic Church in Poland, being instantiated by the personality and ideas of people participating in the communication. Therefore, the fundamental questions and problems highlighted in the above analysis may become more weighty for the development of the information society in Poland than apparently more actual social, technological and organizational issues.

5.11   Wojciech Cellary

Organization of public administration responding to the needs of citizens

New economy requires new administration — this terse statement is a good starting point for the analysis concerning public administration in Poland. A person who, as a consumer, extensively uses digital services provided by e-business will, as a citizen, expect a similar form and quality of services from administration.

There is one reason why administration is a particularly friendly (which does not mean simple) area for computerization, namely it deals with documents, which may be easily digitized. In other words, paper documents like questionnaires, application forms, decisions, resolutions, notices, etc. may be relatively easily replaced by digital equivalents such as web pages publishing necessary information, electronic mail, electronic forms, which can be used by citizens for example to insert an application or a tax return directly to a database via the Internet, or, if necessary, send formal documents signed by means of a digital signature.

Electronic form of the transfer of information and documents, although broadly facilitating everyday citizens' life and improving the quality of service, is but one aspect of the process of adapting the public sector to the needs of the information society. A process centered approach to administration services is more important here. It aims at achieving independence of the informational structure of the public sector from the institutional one. Let us explain it using an example of setting up a company, remembering that one has to face similar problems and go through analogous steps when building a house, purchasing and registering a car, and in many other situations.

In order to set up a company in Poland a certain Mr. Kowalski has to sign an agreement of partnership before a public notary , then apply at the Registry Court to enter the register of companies and receive a certificate of registry, receive a company identification number (REGON) at the Central Statistical Office (GUS), open a company bank account, and inform the Internal Revenue Service of the fact of starting a business. Thus the institutions involved in the process of setting up a company are: public notary , court, Central Statistical Office, bank and Internal Revenue Service. They are all independent institutions and must remain such. Mr. Kowalski is, however, not much interested in a constitutional separation of an executive from the judiciary power while setting up a company. He is rather concerned about the time it takes to do it — running from one institution to another, queuing just to receive an application form, queuing once again — this time in order to put it in, visiting one office over and over again for the sake of finding out whether his case has successfully come to an end, etc. Mr. Kowalski does not understand why these institutions, financed by the tax money he pays, waste his time, which he could devote to making money, also for the purpose of paying these taxes. Mr. Kowalski would like to have all those institutions in one place, he does not want to queue, and finally he wants to be properly instructed in what he exactly needs to do to set up a company. All these expectations on the part of Mr. Kowalski may be satisfied without a big effort by the application of electronic business technology.

It is enough to create an Internet site called *Set up your own company*, where:

1 — Mr. Kowalski will be given all information on what to do;

2 — he will have an access to institution staff or independent experts by e-mail;

3 — he will be able to provide all the institutions involved with the required application forms that are digitally signed, despite the fact that they are statutorily independent and at different locations;

4 — he will receive through the Internet all necessary documents (certificates, confirmations, etc. — also digitally signed, thus having a legal power);

5 — he will be able to check the progress of his case just accessing the proper institution databases;

6 — he will be able to pay via Internet all necessary fees and receive a confirmation of payments.

To explain the idea of a digital signature that is based on cryptography, let us use the following analogy. Imagine a door with such an unusual lock that is equipped with two different keys. The first key can close the door, but cannot open it, while the second key can open the door but is unable to close it. So called asymmetric keys cryptography has the same feature — if one encrypts a document using the first key, then it can only be decrypted with the other. Asymmetric keys cryptography serves two purposes. The first is confidentiality, i.e., prevention of a document from reading by unauthorized persons. The other one is a digital signature, i.e., authentication of the document issuer.

Each person receives a pair of keys. One is called the public key — it can be made public, over the Internet for instance. The other — the private key — must be kept secret and be known only to its owner. If a sender of a document wants to make it confidential, before he sends it over the Internet he encrypts it with the public key of the receiver. Then, only the receiver will be able to decrypt this document, because only the receiver holds the other key of the pair that is his private key. If, on the other hand, the sender wants to sign the document digitally to ensure the receiver that the document comes from him, then he encrypts it with his private key. Then the receiver may decrypt the document using the public key of the sender. If he succeed to properly decrypt the document, the receiver can be sure that it comes form the sender as he is the only person who could have encrypted it in such a way.

The security of encrypted documents depends on the length of the keys used. The longer the key is, the longer processing time is required to break the cipher. With the keys used today this time can reach even thousands of years.

Asymmetric keys cryptography is secure, but not efficient. If a document to be encrypted is short, then the method described above can be directly used. If, however, a document is long then instead of the whole document, its extract is encrypted that is obtained by the application of a hash function. A hash function transforms a string of bits of an arbitrary length, i.e., a docu-ment, into a string of bits of a constant length, i.e., its extract. A characteristic feature of hash functions is that a change of only one bit of a document causes possible a change of all the bits of its extract. Thus, if one inserts just one space in the document, he will receive a completely different extract. When a receiver gets an unencrypted document with its encrypted extract, which is the digital signature of this document, then to authenticate it he performs the following actions. First, he decrypts the received extract using the sender's public key. Then he makes an extract of the document by himself using the same hash function as the sender. Third, he compares the two extracts — if they match, then he is sure that the document has been signed by the person who holds the private key which fits to the public key used to decrypt the extract.

Digital certificate

The mechanism of a digital signature described above has one main flaw. It lacks confirmation of the identity of a person that digitally signed the document. In a bank, for example, a customer has to present his identification documents before any operation that involves signing a document. Such an identification document links someone's personal data like first name, family name, photograph and some numbers with his handwriting. If presenting an identification document was not required by the bank, then a forger could go to a bank, forge someone's signature and withdraw money from his account.

Also on the Internet there is a need to confirm identity. This is achieved by means of a digital certificate that links someone's personal identification data, in particular the first name and the family name, with his public key. A digital certificate prevents a fraud that consists of impersonating somebody on the net by substituting his pair of keys with some other pair of keys.

When sending a digitally signed document (its extract), the sender attaches his certificate. The receiver decrypts it (the extract) using the public key of the sender taken from the certificate. This ensures that the public key indeed belongs to the sender.

To be secure, a digital certificate has

Wojciech
Cellary

Digital
signature

The process oriented approach implemented by the use of the e-business technology has a major advantage, in addition to an obvious improvement of service quality, namely, it does not require uniformity of software systems of all the public sector institutions, which in fact is utterly unrealistic, although repeatedly proposed in different state programs regarding the modernization of administration. Independent institutions, which have independent aims must have specialized information systems. The problem is not so much about their uniformity but rather their integration. E-business technology enables such integration using the Internet, without restricting the number of data sources, database structures, or data formats. The process oriented approach requires, however, an organizational cooperation of different, independent institutions, which is sometimes quite difficult to achieve.

Another very important problem to be solved with respect to the process of the adaptation of administration to the requirements of the global information society concerns the progress in algorithmization of administration procedures. The aim of procedure algorithmization is to allow a computer to perform the bulk of the routine part of work instead of office personnel. Algorithmization may narrow down the arbitrariness of administrative decisions, which, however cannot be reduced to zero, as a certain level of arbitrariness is needed for the realization of governmental policy by the executive power.

The problem of the algorithmization of administration procedures is multifold and complex. First of all, it calls for a precise legal regulations at all levels — starting from the acts and government resolutions and finishing with regulations regarding public offices. It is simply impossible to write a correct computer program based on an illogical or inconsistent law. A computer must be programmed is such a way so as to be able to respond to all possible situations. Therefore it must "know" all, down to the smallest details. Second, it requires a competent staff — people who can — first, algorithmize the legally accepted procedures, then write computer programs and finally integrate them with other information systems. Third, there must exist some methods of verifying whether such computer programs do not breach any law in force. A citizen has to be granted a legal and practicable right to verify the software used by public administration. Without it there is no question of a democratic civil control over public institutions. Just like today, a citizen may lodge a complaint against an office or a clerk, he or she has to be granted the right to lodge a complaint against a computer program and such a complaint — in justified cases — has to be adjudicated in favor of the citizen.

The algorithmization of procedures may help to reduce certain pathological phenomena which occur in between administration and citizens (and also companies), because it eliminates the arbitrariness of clerks and guarantees the same decisions in equivalent cases all over the country. However, it needs to be stressed that a successful algorithmization of administration procedures requires a great determination and a political will as there are two powerful forces which are against it, namely the gray area and administration clerks. People working in the gray area are afraid, and rightly so, that their possibilities will be considerably restricted when computers instead of clerks will make the decisions after administration procedures algorithmization. Simply, a computer cannot be persuaded. Clerks are afraid that the algorithmization of procedures will reduce their authority, diminish their role and importance and deprive them of a superior position with respect to citizens. An alliance of these two forces effectively slows down the process of modernization of administration, which would undoubtedly bring numerous benefits to all law-abiding citizens.

Even a greater challenge for the administration is its integration at the international level. The European legal system guarantees a freedom of migration and settlement within the whole territory of the European Union to all its citizens. If so, it must also provide administration services to all its citizens irrespective of a country. In other words both a Pole living in Spain and an Irish living in Poland have the right to a clear understandable administration service. Here we deal with a huge number of problems — different languages, different ontologies (the same terms — different meanings, similar meanings — different terms, the same terms and similar meanings — different consequences, etc.), different procedures, different administration cultures, finally — different expectations of the citizens coming from different countries. Accomplishing this undertaking is not at all possible without the use of e-business technology. The European Union will undoubtedly work on this problem. If Poland does not make any progress as to the algorithmization of its adminis-

Tadeusz
Piàtek

A digital signature was introduced into the Polish legal system through the Digital Signature Act of September 18, 2001. The Act defines a secure digital signature that: (1) belongs only to the person who puts this digital signature; (2) is created by the use of hardware and data controlled only by that person, and (3) is coupled with the document it is put on in such a way that any further alteration of that document can be identified.

The Act authorizes the minister who is in charge of economy to register the entities authorized to provide qualified certification services, in particular to issue qualified certificates.

The Act renders the electronic documents signed with a digital signature, verifiable by means of a qualified certificate, equal to paper documents signed in hand as far as their legal force is concerned. Thus, the Act enables to state electronically one's will through

tration procedures then it will be unable to take part in the process of integration of all administration systems in the European Union.

The administration has always eagerly responded to the informatization when it comes to its own needs. Yet, it is necessary to computerize the administration to satisfy the needs of the citizens. Such informatization must be combined with administration process re-engineering, because e-business technology allows for a better organization of the whole administration. Such informatization is also vital due to a general trend and political necessity to reduce taxes paid by citizens, which as a consequence, means less money and more work for administration. Without e-business technology this problem cannot be solved.

5.12   Wojciech Cellary
Healthcare

Healthcare is too broad a topic to be comprehensively discussed in one short section; this is not the aim of this report. This section focuses on pointing out the influence of the information and communication technologies on healthcare. It is expected that this influence will be significant; as a consequence it will extend the length and improve the quality of life. However, the changes in healthcare resulting from the application of information and communication technologies are not in fact much different from such changes in business and administration. Below those changes are analyzed and some analogies are pointed out.

The biggest changes involve the healthcare management system comprising: finances, investments, inventories, orders, human resources, statistics about citizens state of health, etc. These in fact are typical business practices just applied in the healthcare area. They will be carried out using the information and communication technologies in the same way as in other areas of business and administration presented in Section 3.1 on e-economy. An exception will be an information system on the citizens' state of health, because on one hand such information must be confidential, while on the other hand it must be quickly available in emergency situations. Smart cards are used for this purpose in the most advanced experiments.

The organization of healthcare at home is expected to change diametrically. On one hand, there will be a growing demand of this type of healthcare due to the aging society and obvious advantages of staying at home while being sick if continuous hospitalization is not required. On the other hand, information and communications technologies will enable distance healthcare systems, in particular the remote monitoring of a patient's state of health, as well as supervising treatment

A continuous development of medical support systems for doctors should also be expected. Following the general trend, medical equipment will incorporate more and more sophisticated computer software. Doctors will use expert systems supporting medical diagnoses more often, as well as systems supporting planning and supervising processes of medical

treatment. Distance surgery will be possible with the use of cameras, monitors and manipulators connected to the net. It seems, however, that patients will be afraid of such forms of surgery –if possible, they will rather prefer to have a surgeon close to them. Such fear is well justified, because if something unexpected occurs during an operation, which can always happen, then the capability of a remote surgeon to react will be greatly reduced. However, watching operations through the net for the purposes of training, as well as the real-time assistance of specialists through the net during surgery should be broadly exploited.

Information and communication technologies also contribute to the progress in biomedical and pharmaceutical sciences, serving as an example of a general process of the informatization of science. It results in the invention of new medicines and new treatment methods.

Information and communication technologies will no doubt be broadly applied to doctor and health workers training. Doctors are a professional group that has a tradition to study during life to increase qualifications in order to keep up with new developments in medical sciences, new cures and new methods of treatment. Here again, the Internet provides great possibilities following from its widespread reach, speed and searching possibilities. Training doctors and health workers with the use of the Internet will not differ much from analogous training methods employed in different areas. (cf. Chapter 7 on education).

The state of health of the society depends greatly on the level of the medical culture and the awareness of the society with respect to healthcare issues. Information and communication technologies may prove to be very effective to increase this level, provided that proper information services will be elaborated. Self-informing citizens, described in Section 7.2, should be provided with all possible means to inform themselves on healthcare issues.

5.13   Daniel Wieszczycki
Polish criminal law and the Internet

The Internet as a global computer network that provides some scope of anonymity to its users may be an instrument significantly facilitating commitment of crimes. Moreover, the emergence of the Internet, has brought about new kinds of crimes.

A growing number of computers in Polish homes, computerization of elementary schools, high schools and universities has brought about a situation where more and more people have sufficient knowledge and the means to potentially use the Internet for illegal purposes. Many teenagers who think they are computer geniuses, for reasons of vanity, fun, or show off, break into computer systems, penetrate them and access confidential information. They leave their electronic "business cards" or maliciously modify web pages of Internet services. It is only one step away from using such knowledge to illegally making money or to shop on the net using somebody else's credit card. In the future we will face a danger of the emergence of whole criminal groups specializing in crimes committed via Internet. Wheedling goods from Internet shops, stealing credit card numbers, publishing prohibited contents like child pornography or Fascist propaganda have become so frequent that a special group coordinating the fight against such crimes has been set up at the General Headquarters of Police.

Polish authorities recognized the new problems and have included regulations penalizing some deplorable behavior of Internet users, previously referred to as *Internet incidents*, to the new Criminal Code introduced in 1998. Those legal measures, however, appear in many cases insufficient for an effective eradication of crimes committed with the use of the Internet and computers. The shortcomings refer both to the Criminal Code as well as to the Code of Criminal Procedure. Some legal loopholes make it difficult or even impossible to fight certain crimes.

For example, the Criminal Code classifies *hacking* as a crime only if hacking is purposeful and effective. A hacker is held responsible for learning information stored in a computer system, only if he or she accesses it by breaking security protection measures. With such regulation, the act of an unauthorized access to a computer system itself remains in many cases unpunished, unless the prosecutor employs a complicated and sometimes even prob-

lematic interpretation, which could be thrown out of court by a hacker's defender. Proving that a hacker has broken into a computer system to get acquainted with the information stored therein is, in majority of cases, very difficult and sometimes even impossible.

An additional problem is caused by the lack of regulations on securing and then analyzing electronic evidences during early stages of proceedings. The applicability of such evidences is questioned, because they can be easily tampered with or forged.

The Code of Criminal Procedure defines only the procedures of detaining things that can be used as evidence in proceedings. A "thing" is a computer, a hard disk or a diskette. Detaining a computer or its hard disk is today the only method provided by the law for securing evidence with respect to crimes committed with the use of a computer or against a system installed on a computer. This irrational legal situation, where existence of electronic evidences are not taken into account, significantly hampers a smooth and fast progress of the proceedings, because it is not admitted to analyze a true copy of a hard disk of a computer being an evidence. As a consequence, this leads to the increase of an number of computer crimes that have not been reported. A victim, often a businessman, is afraid to report a computer crime to relevant authorities as it is highly probable that the prosecutor, for the benefit of his company, will detain the computers — indispensable for doing business — as evidence in the case.

It is worth noting that in the current legal situation in Poland it is very easy to question evidence in the form of an electronic document. A possibility of modification of system logs, i.e., computer files, where user actions are recorded, is a major argument used by the defense in all trials against hacking. Therefore, it is necessary to propose *de lege ferenda* regulations that allow electronic evidence in court and allege their validity under well specified conditions.

The unreported number of computer crimes is particularly high. Among the victims of hackers are mainly banks, insurance companies, big Internet shops and computer network operators. For these companies the problem of the security of information provided by their customers is particularly important. Therefore, it is not very surprising that such crimes are concealed by them, as the losses resulting from crimes are usually much lower than the consequences of losing the trust of their customers. In addition, the low number of reported computer crimes is also a result of the general lack of belief in the ability and willingness of the police to deal with difficult cases requiring expert knowledge and involving long and complex proceedings. The level of legal competence of the courts with respect to computer crimes and other offenses concerning an access to confidential information, despite some special training in this area — is still insufficient.

To summarize, in order to effectively cut down the number of computer crimes, especially those committed by the use of the Internet, the Criminal Code and, in particular the Code of Criminal Procedure, have to be urgently revised so that they catch up with the technological progress and the growing knowledge of the society. In addition, special training programs for the police and courts should be organized in order to increase their awareness of computer crimes.

5.14 Kazimierz Krzysztofek
Homo mobilis: lifestyles and forms of activity in the information society

The computer is becoming a ubiquitous, silent and invisible agent of our lives. It is both everywhere and nowhere; it becomes a sort of a universal **metamedium** — it can integrate with nearly all devices. People can use computers in almost all areas of life — for study, work, to shop, chat with other people, visit a museum, a library, to listen to music. Browsing the Internet becomes as common as reading or writing. Computer is the future, career, prestige and fun.

According to many scholars and researchers the computer changes the concept of freedom, intelligence, truth, wisdom, memory, history, fact, religion and God. In the computer

and Internet era — the two inventions so greatly influencing the lives of individuals and societies today — being acquainted with the information technology becomes correlated to a new social reality, which requires a different approach to that of the former industrial era: indeed we speak today of e-government, e-citizenship (netizenship), e-crime, e-culture, e-politics, e-money, e-law, etc. Here we should ask an important question: can we — in the circumstances of a rapidly changing reality — follow a traditional set of rules and regulations or do we need new ones? For instance — are the ethics of information a part of traditional ethics or represent brand new ethics? In the new reality a society must again come up with a set of moral and ethical values and negotiate new social contracts in the "net state".

We witness a de-hierarchization of life, which may be referred to as its disintermediation. We speak of a major social revolution: in the industrial society political parties, journalists, teachers, priests, people popularizing science or storekeepers allowed us, that is citizens, consumers and individuals to analyze, sort and finally chose one product from among a number of products. These institutions served as gatekeepers, they controlled the flow of tangible and symbolic goods that reached a consumer by means of censorship, verification, selection, etc. The people involved in these processes were people who enjoyed our respect.

With every new supermarket or a fast food set-up the number of mediators decreased. This also concerns the information society, where we also witness a reduction in the number of mediators: the information consumer (the end-user) by being connected to the Internet in his own home "infotainment" center is able to communicate with the source, which reduces the producers' costs (they do not have to pay for "information wholesaling"), we study at home, shop at home (although still relatively rare), and in future we will cast our votes in election from home. In brief, the end-user takes over control of the communication act, creates his or her own thematic channels, operates a TV remote control (*homo zappiens*) and a set-top-box (a TV set accessory which allows access to the net), he becomes simultaneously the sender and the receiver. As a result of the demonopolization of the informational structures, the information ceases to be a rare "commodity". We have come all the way through from the scarcity of information to its abundance or even over-abundance. This informational and cultural bypass is a great challenge for all those who want play the role of mediators. How do they get to the end-users, what services should they offer and how can they make a living from it?

Paradoxically, the abundance of information has similar effects to its shortage. Many people are not able to deal with the inflow of information and feel overloaded. Not everyone can control the information by him or herself and remain dependent. This refers primarily to uneducated people. There is an increasing demand for intermediaries, however, completely different to the mediators in a traditional sense. Today, instead of gate keepers we have two-way flows of information. Today's new intermediaries of the electronic world do not filter information, they rather integrate various systems and groups of consumers. They are new agents, they assist in navigating, browsing and searching the Internet; they integrate, analyze, indicate various trends, authenticate and contextualize information, and help in transforming the information into databases. We witness an emergence of new skills: a personal information manager. There is a growing demand for such specialists. The problem becomes that such personal information managers have to compete with software intermediaries, with more and more intelligent devices which select and manage information (for example *tell your agent to call my agent* devices).

Due to data communications, there is a growing transfer of the labor force on an international scale. In information companies, the distinction between working hours and leisure time is fading. The development of mobile telecommunications contributes to this reality. It is difficult to predict the social changes that will result from the intensification of the above trend.

A number of fixed reference points wither away in the information society. For instance, a profession or steady place of work which used to have a great influence on our identity. An eight-hour working day is a myth today. International companies impose flexible working hours due to different time zones. The old, traditional system of employment may only exist today in industrial niches. The distinction of working hours and a leisure time, which was fundamental for the industrial society is vanishing. Acquiring new qualifications involves thousands of new styles of learning.

Industry informatization analysts have noticed that employment is not so much related with periods of economic prosperity any more, which was a characteristic of the economy

dominated by traditional industry. Progress in technology always reduced the demand for labor. However, in the periods of market booms the unemployment rate always substantially reduced. Today we also witness rapid changes in the structure of employment — for instance the demand for workers involved in tangible goods production as well as in the sector of computerized services diminishes. Every device of the new generation means capitalization and reduces the demand for human labor performed by *homo laborans*. Only the highly educated and best qualified workers and those who can find a niche in the market can find a job. Generally speaking one can say that computers and computer networks make us increase our intellectual level. There is a hope that the development of the information society will foster our intellectual growth, both personally and our general development as Humankind.

It is too premature to claim that the computer has been the main job killer in the history of work. Today, social policy makers face a huge problem concerning employment and unemployment. The challenge is not so much to increase the number of jobs available but rather to find occupations for millions, thus taking away from them the feeling of being needless.

Guaranteeing equal opportunities, fair chances with respect to creativity, participation in political and cultural life, the right to preserve social cohesion and diversity as well as protecting people from being excluded from society — with respect to all people — become the most difficult social tasks for all of us. In other words, we must all do everything in order to prevent the emergence of a new social underclass. There is a chance that the development of new technologies, new adaptation problems resulting from rapid social changes, the demand for creativity, increase in the unemployment rate or the growing number of pensioners, will all lead to a growing demand for social workers which will make it the fastest growing sector in the economy. We can already notice a growing demand for personal teachers, advisors, mentors, computer instructors, etc. — who may even work at client's homes and assist them in finding proper information in future. Such social workers would be able to make up for the gap resulting from the loss of the traditional social norms.

There is an ongoing dispute concerning the information technologies as to their influence on people's lives. Various viewpoints are presented, some point to a dehumanizing influence of computers, whilst others claim that they are only the extensions of our senses making our lives more complete (similar to the devices extending our senses like optical appliance or hearing aids, etc.) Such inventions allow impaired persons to fully participate in the community life. Devices which extend man's communication abilities like mobile telephony play a similar role. The research conducted in some European countries of traditionally strong family bonds (for instance in Italy) shows that the mobile phone has become a major social instrument, which strengthens family bonds even more. For example, using a kid mobile phone a child may keep in touch with his or her parents, brothers or sisters, or in general, to home, thus creating a feeling of the tele-presence of his or her family.

Telework is an example of a phenomenon which cannot simply be classified as being, good or bad. On one hand, the use of mobile telephony and the Internet make it possible to work at home on a personal workstation consisting of a computer and numerous devices. On the other hand, it reduces the integration of working teams. People who only stress the process of the individualization of life, ignore the fact that thanks to new communications devices there is the emergence of new communities, so called virtual communities, with their own codes of communication (e.g. the language of SMS).

Numerous examples can be found to show that the information technologies may increase the erosion of social bonds. In some respects they may, however, reduce it. The information society, although abundant in technology to an unprecedented extent, puts more emphasis on "the play with people", which has substituted "the play with nature", which was characteristic for technical and engineering professions, great industrial structures, dehumanizing production lines. Within this "play with people" we observe most well paid professions today (management, media, all sorts of personal training, information services, communications, advertising, public relations, image-making, marketing). Thus, we may claim that the information society brings back — although in an altered form — many institutions which ceased to exist during the industrial era. These include home workbench or studio (computer station), small supra-family groups or decentralized communication, which stands in opposition to huge media centers reaching multimillion audiences with the same message.

5.15   Michał Goliński
Statistical characteristics
of Polish Internet users

Internet users
by level of education

university

28%

22%

10%   sec-
ondary

post
second-
4%

36%

sec-

author's calculation based on interbus VII/VII

25%

10%

rural

14%

above 500 000

19%

15%

100 000 - 500

20 000 -
100 000
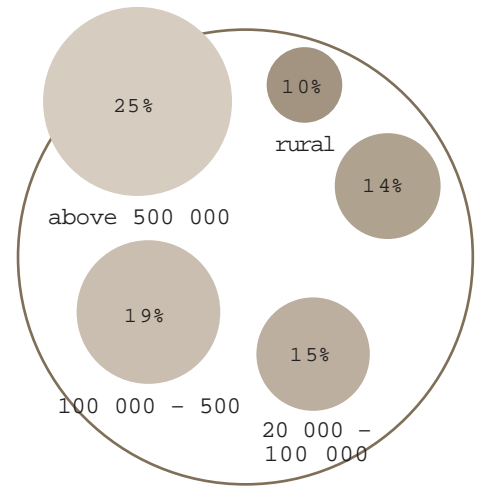
author's calculation based on interbus

Internet
use rate

every

less fre- 5%

22%

26%

14%   3-5
times

1-3 times
a month

33%

author's calculation based on interbus VII/VII

15-19

60 +

1%

28%

20-29

50-59

5%

32%

40-49

16%

18%

Internet users
by age
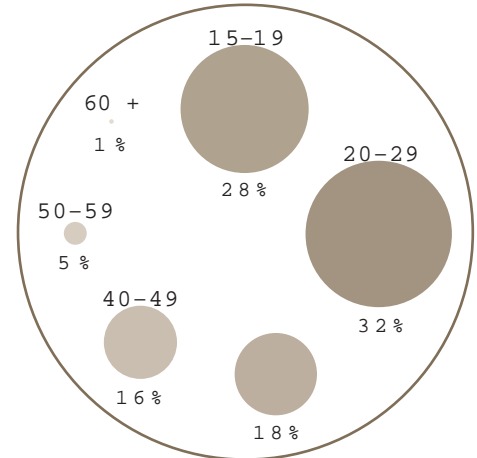
author's calculation based on interbus VII/VII
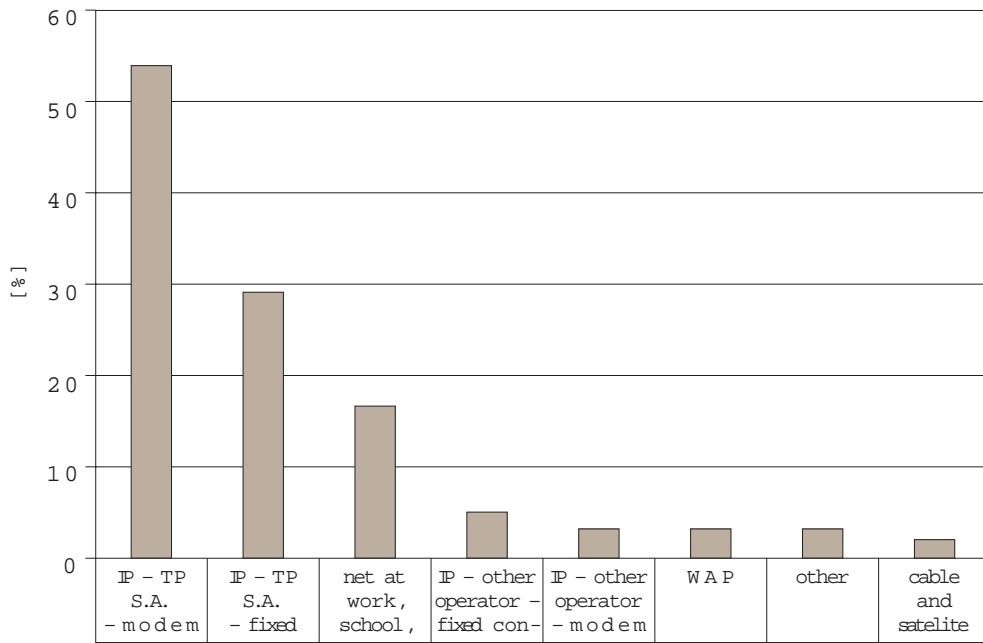
Most popular
connection type
to the Internet

author's calculation based on interbus VII/VII 2001 TNS
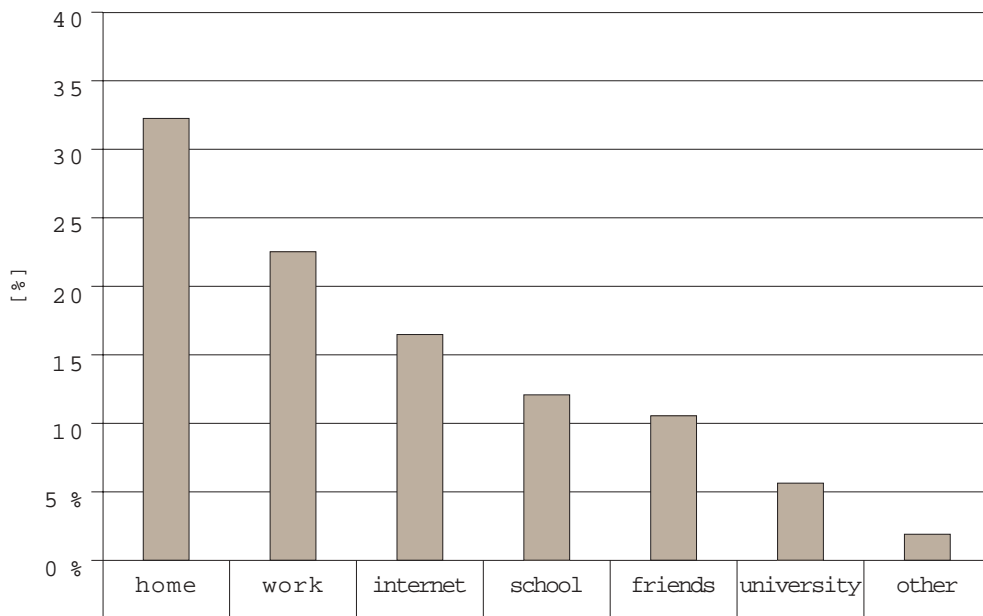
Most
popular place
of the Internet
use

author's calculation based on interbus VII/VII 2001 TNS

103

Internet users
in different
age groups

[%]

	15–19	20–29	30–39	40–49	50–59	60 +
upper	62%	75%	83%	88%	95%	99%
lower	38%	25%	17%	12%		

author's calculation based on interbus VII/VII
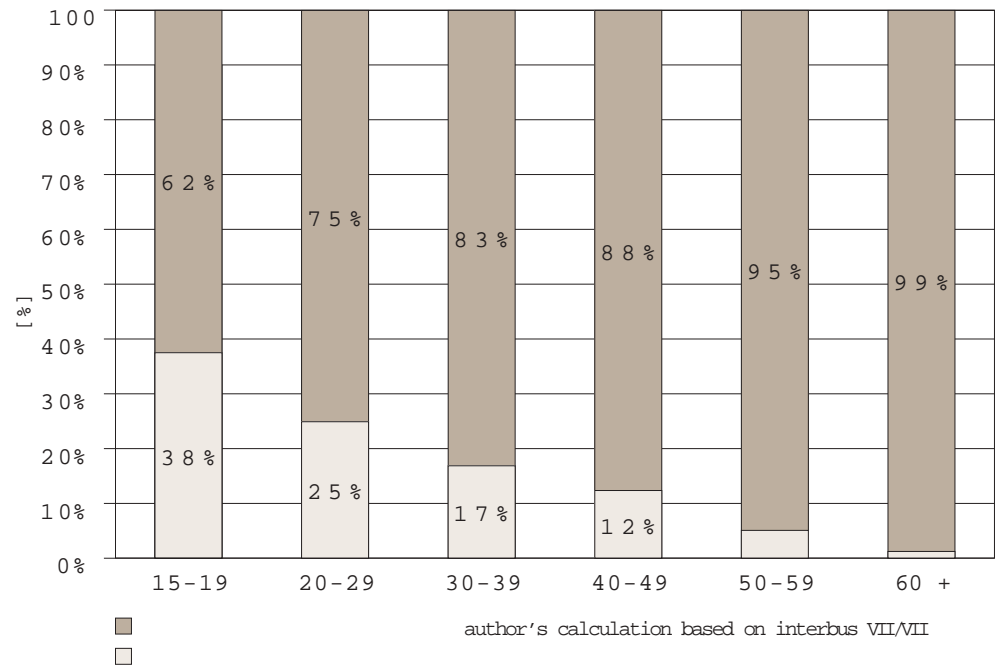
Internet users
in different
education groups

[%]

	primary	secondary	secondary post	secondary	university
upper	89%	95%	83%	72%	59%
lower	11%		17%	28%	41%

author's calculation based on interbus VII/VII

104
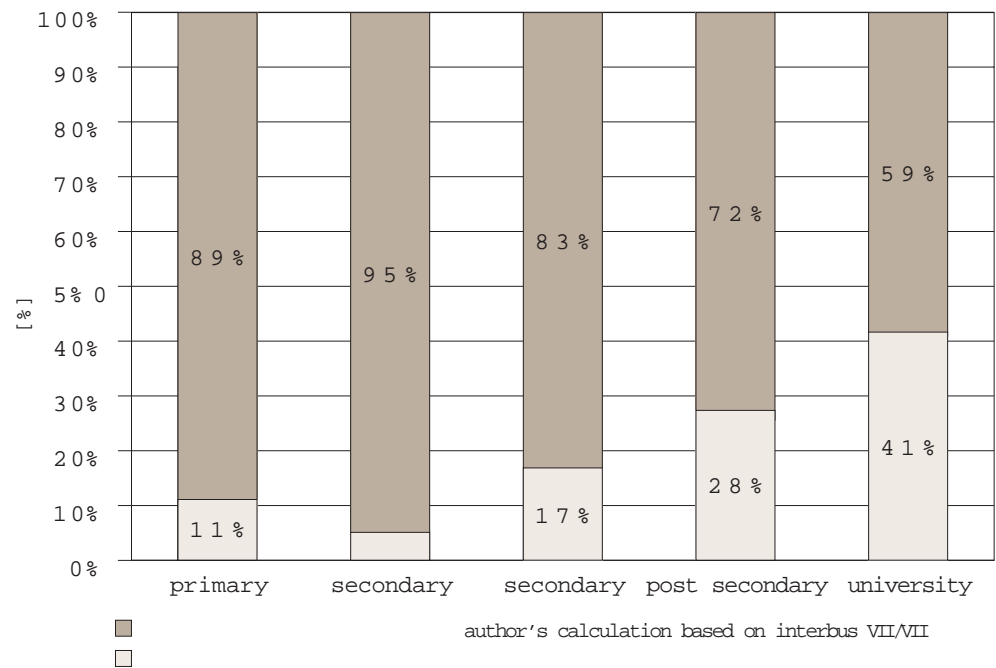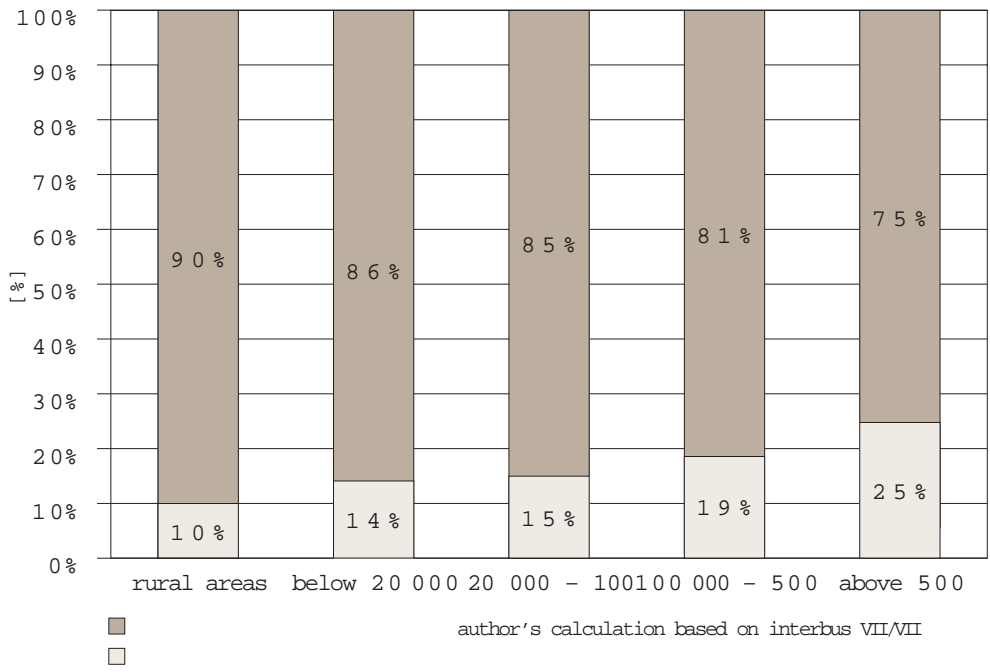
Internet users
in different places
of residence
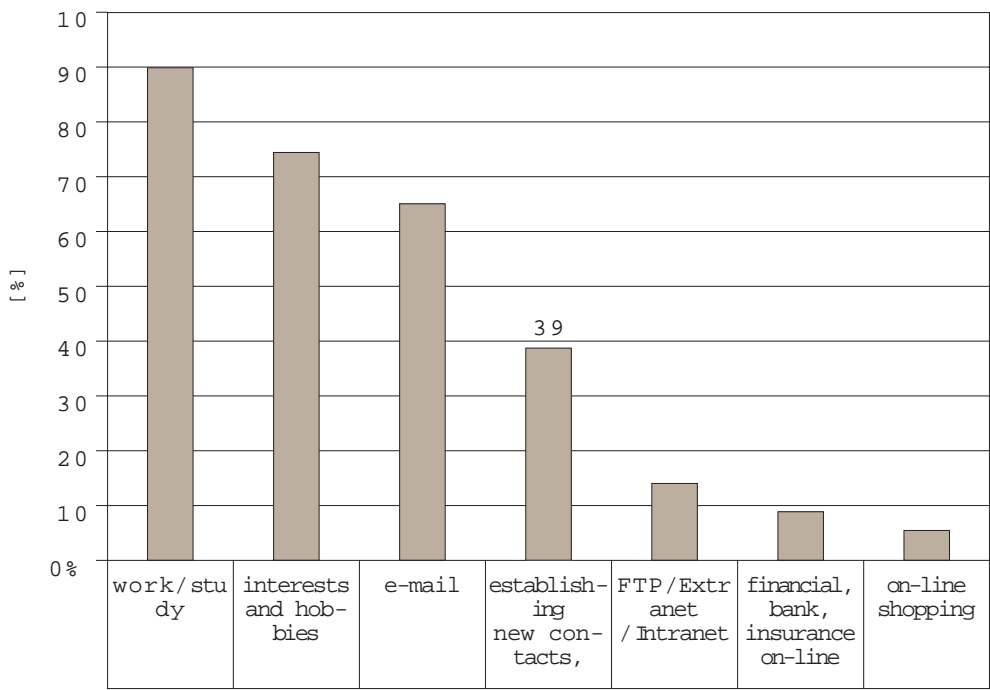
Most popular
purposes
of Internet use

Residents per one host
and the number of hosts
as of August 2001
(with respect
to domestic domains)

	Germany	France	Sweden	Spain	Czech Rep.	Hungary	Poland
	34.00	75	13	81		64	71

based on RIPE

Only 4% of people
declare
that they intend to get
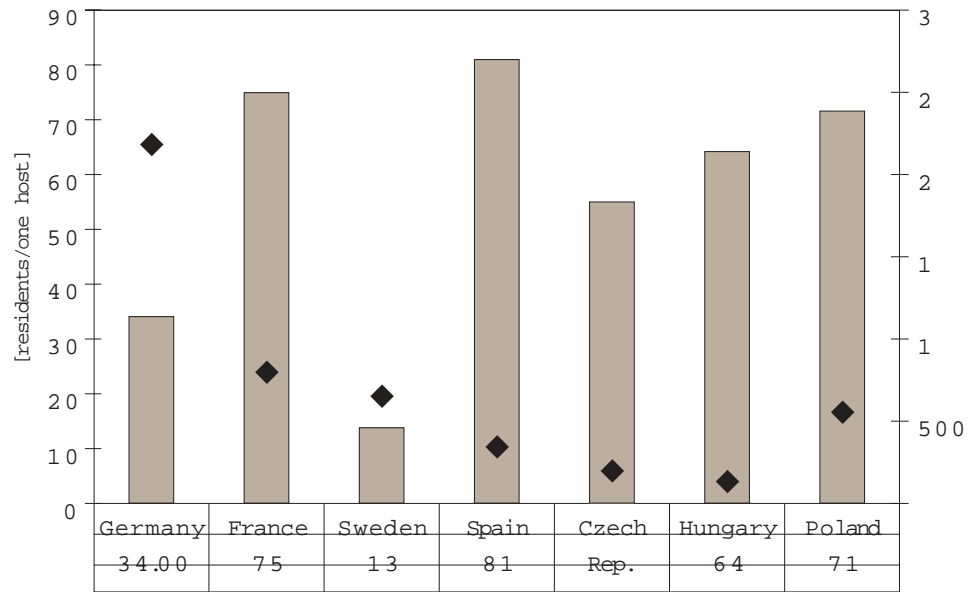
People having access
to and using the Internet
VII/VII 2001

access

access –
uses
15.4 %
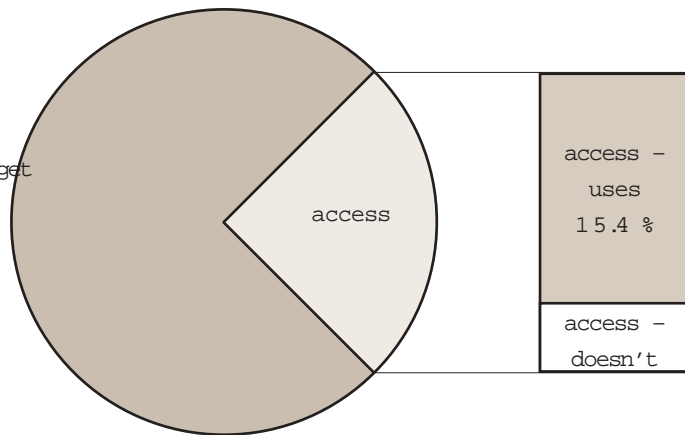
access –
doesn't

based on interbus VII/VII 2001 TNS OBOP

Percentage of people
who have shopped
in the Internet
or intend to do so

with respect to the Internet users   with respect to the whole population

author's calculation based on interbus VII/VII 2001

106
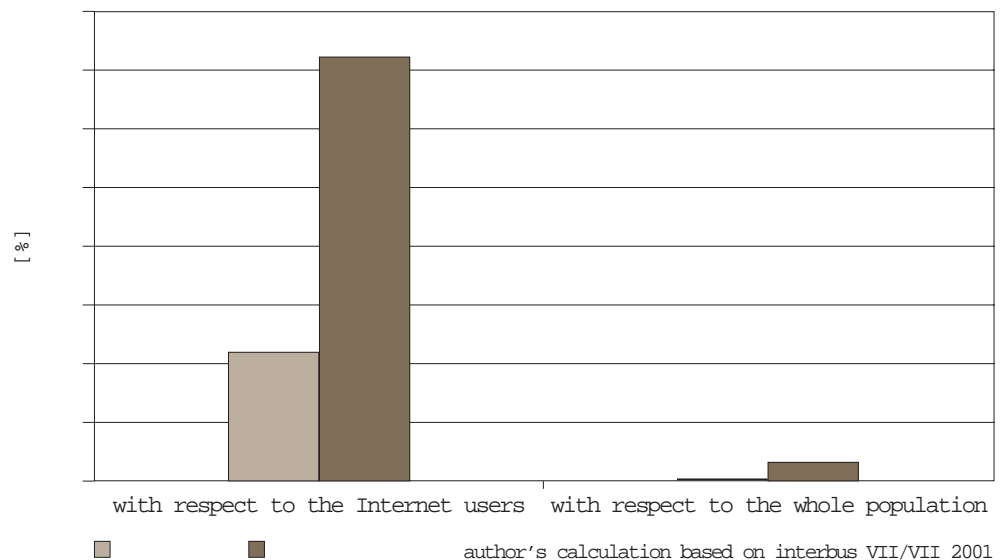
6.1 Kazimierz Krzysztofek

Access to culture

In today's world where communication between people is greatly influenced by the synergetic effect of the market, freedom and technology, we have to deal with two models of participation in culture. The first model — prevailing in the majority of world regions — is based on participation in an analog culture whereas the second is based on participation in the computer network culture. The first model has a mono-active character, it is related with a traditional mass media consumption and is based on a uniformed offer, addressed to huge audiences. The second involves a new type of culture consumption being mediated by data communications networks and which is interactive.

It is probably one of the most important sociological characteristics of the modern developed societies and it has many consequences for education and cultural policies. Unfortunately, there has been no research on a nation-wide scale that would allow a precise evaluation as to what factors determine the above dualism in cultural participation — whether biological (age, sex) or sociological (education, place of residence: town — countryside, social status). Based on the random research that has been done so far we may claim that age is the most important factor determining whether a person accepts the first or the second model of the participation in culture. The second most important factor is sex, then education, and finally social status. It reaffirms a general tendency noticeable in developed countries which provide evidence that mainly young and educated men (with secondary or higher education) participate in the network culture.

A closer look at Poles' participation in culture emphasizes the growing role of the interactive technologies in the process of individualizing the culture consumption pattern. Indeed, there is a trend in culture to orientate oneself towards individual needs of the customers. This process is, however, far from the end. We observe the processes of media and culture capital concentration. Huge tycoons integrating old and new media — America on Line-Time-Warner, Ruppert Murdoch, Walt Disney, Sony Corporation, Bertelsmann, Vivendi — focus on responding to more diversified needs on the global scale. We might say that it is not about individuals who are a part of masses, but rather about individualized masses. The diversification of the offer and the growing number of options to choose from are, however, accompanied by the diversification of the consumer being determined by economic status. The offer of so called niche media including satellite, cable TV packages and digital platform thematic channels is becoming more attractive and comprehensive.

It is difficult to say whether we deal with a transition from the analog culture to the digital culture in Poland today. A permanent or an irregular access to the Internet is declared by less than 4 million citizens in Poland (which accounts to 15% of the population of people over 15 years old). Digitization of terrestrial TV or radio which would provide an access to the Internet to all Polish households will take place no sooner than a dozen or so years from now Obviously, digitization provides all people with the tools enabling active participation in the information society, however, the society will still be divided into the interactors and passive receivers.

The competition between the Internet and other analog media seems to favor the first medium, which is also true in Poland. It especially concerns young people (being the most

Henryk
Hollender

Libraries
on the way
towards
the informa-
tion
society

There are nearly 10 thousand libraries in Poland, including 1200 research libraries. They comprise of approximately 137 million items. The catalogues of around 100 libraries — mostly university and municipal research libraries — are accessible via the Internet. In the 1990's there was an increase in readership at the National Library of Poland, large university libraries, pedagogical libraries and provincial public libraries.

Libraries soon recognized that computerization significantly reduces the costs of cataloguing and making the book available to the public. However, in Poland, economical motivation has not been the main reason to computerize libraries. Here the libraries treated computerization as a societal challenge and a chance to build a more efficient access system. As late as 1993 the bibliographic record format was unified in the whole country (US MARC) and then deployed together with the improved cataloguing rules initially introduced already in 1985. A unified format enabled libraries to present data in a similar way in different catalogues, then made it possible to exchange data between libraries and finally consolidate catalogues. Such a system was first introduced by university libraries in 1992. It was implemented with the financial support granted by Andrew W. Mellon Foundation, which enabled to deploy the Virginia Tech Library Systems (VTLS) software bought in the USA. Using VTLS, the libraries could mutually see their catalogues, and take over bibliographic records, which brought considerable savings. After the catalogues were made available electronically, any person using the system interface (not Internet interface) was able to choose the catalogue of any library in Poland using the VTLS system.

The libraries using VTLS also developed of a common set of personal names, subject headings, uniform titles and series titles used as entries in catalogues. This method, known as authority control, provides a compatibility of catalogue databases and a possibility of cross-references. Central Authority File held by the Warsaw University Library currently consists of over 500 thousand headings, including 50 thousand of the KABA language subject headings, which is compatible with a similar foreign system — Library of Congress Subject Headings — being the largest in the world. Central File of Journal Titles, held by the Main Library of the Gdańsk University, comprises 12 thousand bibli-

ographic descriptions of journals. The 28 biggest libraries in the country (using VTLS, Horizon, Aleph and Prolib systems) are involved in the process of constructing both databases. They have started to provide the central national universal catalogue, called NUKat, with records.

Librarians are aware that it is not enough to provide the reader only with the information on the call number of a given book within a library system. A reader wants more than that — to have an access to documents in any library all over the world, and moreover, the full texts of those documents. Such full texts are often accessible via Internet for free, however, fee-based services available on various sites are indispensable for serious research. The first years of experience of the Internet use in libraries show that the user-friendly character of the new searching techniques discourages people from deeper exploration, or even teaches them to disregard the documents unavailable in a digital form. Internet users rarely use printed documents in libraries. Printed documents are more often used by students who are given reading lists and are in turn not encouraged to browse the Internet. Thus, there is a justified anxiety that the disproportion in access to the Internet, provided it persists despite rapid development of networking, will lead to the emergence of two non-communicating subcultures using different ways of knowledge acquisition — the paper and the electronic one.

One of the ways to overcome this undesirable effect should involve a planned transformation of the printed, handwritten and graphic documents into a digital form. The presenting of files in the HTML format on the Internet by libraries, archives and museums turned out to be a simple task. Using this technique, not only exact copies of selected documents, but also old and voluminous card catalogues, the conversion of which is difficult (Jagiellońska Library, Ossolineum), can be found on the Internet. There are also Internet editions of the literary output that can be used for educational purposes and study. There is a trend which has gained popularity in many countries, which would also be worth implementing in Poland, of publishing reproductions on the Internet with a deep indexing system. It enables searching by headings and terms used in the text. A new generation of library systems will soon enable access to the full text ver-

important target group for the advertisement market), which results in an even more severe competition to attract the attention of the viewer.

Even taking into account all the advantages of the digital culture, mass culture cannot be associated with only the negative and the digital culture with only the positive aspects. Mass culture does not necessarily have to be the synonym of trash. The Internet is full of interactive trash as well. Information technology divides culture not so much into positive and negative, high and low, the elite and mass but rather into the digital and analog. The elite culture or the culture pretending to be one can be accessed today by the masses (a good example are the famous concerts of the three tenors watched on TV by a few hundred million people all over the world). This is why it would be an oversimplification to say that people who constitute the target group for a mass offer belong only to the analog entertainment society (implying poorer quality), and that the Internet users belong to the digital knowledge society, where a continuous learning is a way of life. Nevertheless, based on the research conducted in many countries, including Poland, people who seek knowledge and information indeed use the Internet more often than television.

There is a danger that as a result of the current tendencies of electronic media development in Poland, people will be divided into two groups. The first — "the analog proletariat" — which will consist of the consumers of cheap programs filled with commercials. The second, the richer one — "the digital aristocracy" — will consist of the receivers of coded programming, cable packages, digital platforms, consumed by those who can afford them. The economy determines the speed of social changes. Audience fragmentation and addressing messages to many different social groups results in a disintegration of the society. In fact, it becomes more diversified than unified. This process is also visible in Poland. Only widespread digital TV and radio platforms may improve such an undesirable situation. We are not able to predict what costs will be involved (for instance copyright fees).

Commercial TV stations do not rest in their effort to keep their viewers interested in their mass offer. They do it in many ways, one of them is not too sophisticated and is based on man's innate drive towards voyeurism and exhibitionism. This is exploited by such programs like Big Brother (first introduced by Dutch TV, now broadcast by many TV stations, including two Polish ones) which are also accessible on the Internet.

The number of educated people in Poland is rapidly growing — mainly due to the growth of higher level private education. Thousands of private educators compete to lure new students offering many attractive course possibilities. The same is true in respect to entertainment and the ways of spending leisure time. A growing number of Poles have more individualized needs which cannot be satisfied by one or two content providers who only offer one entertainment model. They constitute the target group for the aforementioned digital platforms and formatted channels, and in future for the providers of the interactive television. The progress of the interactive television, particularly in the western Europe, suggests that it will also soon occur in Poland.

The dualism of popular culture reception is expected to continue for approximately 10 years. The *man-computer-Internet* model is rather unlikely to be the dominant one for providing entertainment on a mass scale. The computer in such a model is a kind of an *omnimedium* also being used as a TV set. We know that only a tiny minority use computers for entertainment and can do it effectively. Therefore, it seems more probable that the *bimedium* model, where one uses a TV screen instead of a computer, will prevail. It would not be in fact "a TV set plus the Internet" but rather a TV set which will be occasionally used for the purpose of accessing the Internet. Such a model is becoming increasingly popular in

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New media

New media started deep changes many times in history. Let us mention here four major breakthroughs of a comparable magnitude and importance. The first one was a result of the introduction of a phonetic alphabet out of which was borne linear perception and thinking, as well as separation of the sphere of thinking from action. The second breakthrough was brought about by the invention of the printing press by Gutenberg which undoubtedly marked the onset of sweeping social, economic and cultural changes. The results of these changes can be seen up to the present day. The third revolution that took place was due to radio and television — its results have not yet been fully absorbed and recognized by the societies. The latest great breakthrough were the invention of the computer with huge memories and the global Internet computer network. It is impossible to predict the impact of those inventions that already influence almost all spheres of human activity.

The term "new media" has many meanings. Two of them are of interest here. The first one means new techniques and technologies per se, with the Internet being the most important example of a new technology. It is a relatively new medium based on hypertext mechanism and techniques enabling an interactive dialogue with a user — often in real time. The Internet has become, just within the last decade of the 20 c., a separate global communication and information universe. Today it is more an integration platform for new and traditional media and different forms of activity. We notice the phenomena of media convergence, that is a unification of radio, television, newspapers, telephone, fax and the Internet. As a result, today we deal with one integrated information universe — a dense information audio and iconosphere, with conditions differing substantially from what has been known to us in the past. The Internet has been developing extremely rapidly, offering new opportunities to all social and professional groups. It offers new services (media), the most popular of which is the World Wide Web. Other popular services like electronic mail, chat rooms and discussion groups also influence greatly the sphere of a broadly understood culture.

Other examples of new technologies that affect culture include mobile telephony with the ubiquitous mobile phone, also virtual reality, haptics interaction, agents (autonomous programs performing different tasks on the Internet, like for instance collecting or distributing information on a given subject) and digital high-definition television (HDTV). Among new technologies we also encounter DVD discs with a gigabyte capacity, digital cameras equipped with a wireless connection to computers processing images and sound, or flat LCD monitors.

The second meaning of the term "new media" refers to new ways of using already existing technologies with reference to known processes, situations, organizations, etc. Here we can mention the examples of digital libraries, virtual museums, interactive books (stored on CD-ROMs or DVDs and played on the computer), e-books,

Europe, which is more developed than the USA as far as interactive TV programs are concerned. Everything seems to indicate that we will use a new medium in an old way rather than an old one in a new way.

The above process will also take place in Poland. Economic conditions will determine how soon we will enjoy a widespread and cheap digital radio and television, offering various cultural and educational services. The digital culture understood in such a way will play a major role in the development of the information society in Poland and will be a powerful tool popularizing the Internet, much more powerful than the network computer. It is difficult to predict, however, the share of the market and the number of private and public companies that will offer digital services.

Another concern is the quality of the offer. Television and multimedia are "blind" — they can be used for good and bad purposes. Poland does not invest (like many developed countries) in the education of the people that would teach them respect for values and the ability to organize those values in a hierarchy (higher and lower culture). Insufficient efforts are made to promote values and culture among mass consumers. Given this one can say that the elites evade their social role as an authority to make judgments as to what is good and what is bad for people. They are replaced by entertainment providers who deem it best to

give the people what they want and demand. Obviously "what the people want" sells best and brings the highest profits. Therefore, this model is purely commercial and is the most profitable for private media. They are only restricted by specific legal regulations and they do not feel obliged to promote non-commercial culture at all.

Today we witness the development of such a model in Poland. The intellectuals, with their educational and cultural mission, yield to a group of professionals providing the society with the products which do not fulfill spiritual needs and play no educative role. It is the model of culture where one is not a participant but just a consumer.

There is an ongoing dispute in Poland as to whether the national identity and social uniformity can be preserved just by the intensification of the efforts to transplant the old, traditional set of national values (which was the task of the intellectuals) or whether Poland should try to find its way towards a broader — European or even universal identity. In both cases efforts are taken to preserve the word culture in which generations of educated men and women were brought up. The thing is the young generation should be offered high culture using a new language. There are voices saying that the domination of audio-visual language which can be understood by any illiterate person lowers the level of pop culture even more. Others claim that iconization of communication codes will enable future generations to use human's natural skill for multimedia perception to create a new language which may allow men and women to develop both their ideas, creativity and emotionality more than with the use of a traditional, linear and alphabetic language.

The second opinion is most popular among the new generation of Polish intellectuals when considering the future of the Polish culture, politics and cultural education. According to them every medium, including the Internet, may be used to promote important values for the national culture. They advise to improve "the image" of computer games, so popular among children and teenagers, by introducing an alternative, more attractive offer which could employ, for instance, Polish historic events, geographic discoveries, etc.[1] Modern generations should not be deprived of the means to express and receive the high culture even if we face today a crisis of the printed word. It sounds like heresy to those who express the opinion of a key importance of books and readership for the cultural development. The problem of culture and media education is a crucial one in the context of the information society.

To sum up, we will be able to talk about a breakthrough in the access to culture, provided that the model of the terrestrial digital radio and television is implemented. Today more than 50 percent radio listeners and television watchers, particularly in small villages know only generally accessible channels and programs. A breakthrough may be provided with the digitization of the culture heritage not only for the purpose of facilitating access to the national culture in the information society but also for the purpose of the promotion of local and regional cultures. Without it Poland will not be able to keep pace and cooperate with the world on the cultural level and it will become an analog enclave far away from the rapidly changing civilization.

An important question arises: if the information society is built on the substrate of the national states, does it mean that there will be many information societies and each of them will have its own cultural characteristics? In other words: will the global information society be an aggregate of the national, regional or local societies or will it form a brand new quality. After an initial period of fascination with a global reach of information, more and more people try to get in touch with the members of their own local communities. Some researchers predict that after the phase of the Internet universalization it will gain a national character in a similar way to Christianity which originated as one, universal religion, but later evolved towards many national ones. It is, however, equally probable that there will be two layers of culture: the first — universal — implementing a common code for the global information society, and the second — unique — preserving local codes (national, regional). It creates a chance for countries like Poland to preserve their individual identity and the ability to perceive oneself through the perspective of ones own national culture using the new media with which it can be transferred.

1
W. Godzic, Klub siedzącego kartofla kontra internauci z Tucholi [The club of a couch potato versus Internet users from Tuchola]. Tygodnik Powszechny, 17.09.2000 [in Polish].

6.2   Dorota Ilczuk
Culture industries

"Today we face a necessity of finding new solutions guaranteeing a dynamic economic growth and an increase of the competitiveness of Poland as a place of production, investment and residence. Rapid economic development will not be possible without using the economic potential of culture. There is no other way towards a better future for our country than a gradual transition towards the economy based on knowledge, creativity and human capital."

This was a view expressed during the conference "Culture and culture industries — development opportunities for Poland"[2], Warsaw, June 13, 2001, organized by the Gdańsk Institute for Market Economics that shows a new approach to culture. It exposes the importance of culture for both the social and economical development of the country. From the economic point of view, the decision of the best educated people who represent the most valuable intellectual capital and thus who are the most desirable workforce, whether to work and live in Poland will depend on the level of social development that is greatly determined by culture. Characteristic features for cultural activity like: creativity, initiative, the ability to deal with constraints, the ability to communicate with other people, etc. are today the most desirable features of businessmen, since these qualities determine the development of business in general. Moreover, the cultural components of products and services become the dominating factors of competitiveness due to the fact that technology and business models become more and more universal.

When considering the issue of culture financing, two models may be distinguished: the model of a non-profitable culture, subsidized by public resources, and the model of profitable culture industries where cultural goods and services are produced on an industrial scale[3]. Both models shape the cultural life, and are today rather complementary than contending (see Fig. 6.1). The only exception to the above rule are public TV stations competing with the private ones. When we understand mutual relationships between the above models, we may look at culture industries — characterized by a high economic potential based on domestic and foreign capital — as a potential important source of non-profitable culture financing. The income from the taxes paid by culture industries is much higher than the amounts spent on culture from public budgetary sources. Culture financing should be regarded as a long-term investment of a social and economic character.

The significance of culture industries for an economic development of countries is, to a great extent, due to their capability to create new jobs. According to the European Union data there were 2.5 — 3 million people working in European culture industries in 1995.

2
Warsaw, 2001-06-13, Institute for Market Economics.

3
The information on culture industries is in a major part taken from the empirical research conducted at the Institute of Culture (published among others in: Polish culture in the decade of changes (Kultura polska w dekadzie przemian) edited by T. Kostyrko i M. Czerwiński, The Institute of Culture, Warsaw, 1999) and also from the programs conducted by the Council of Europe and ERICarts.

Fig. 6.1.
Mutual relationships between culture industries and subsidized culture
Source:
Arbeitsgemeinschaft Kulturwirtschaft, 1998.

Dorota
Ilczuk

Polish culture
and culture
industries
in 2000
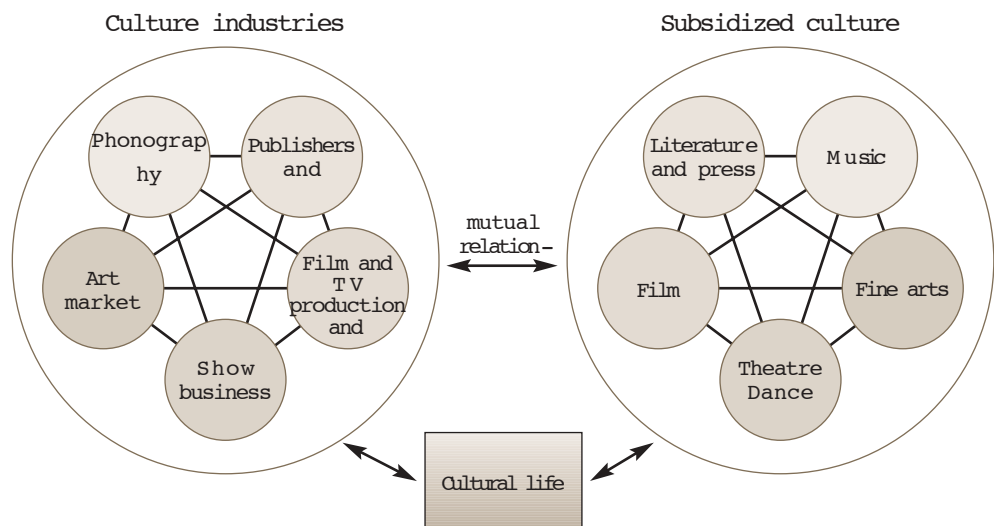
Number of libraries and branches — 8 915
Book collection —136,6 million of items
Number of museums — 623
Exhibits in museums — 13 092 thousand
Exhibitions in museums — 3 535
Number of galleries — 253
Exhibitions in galleries — 3 009
Musical theaters and institutions:
· Number of seats in the auditorium — 66 735
· Number of shows (plays) — 50 086
Number of cinemas — 687
Number of seats in cinemas — 227 thousand
Number of films:
· Feature films — 20
· Short subjects — 546
Radio broadcast stations — 180 (out of which 17 public)
TV stations — 26 (out of which 12 public)

Publishing houses — non-periodicals:
· Titles — 21 647
· Circulation — 102 774 thousand items
Publishing houses — periodicals and newspapers:
· Titles — 5 534
· Circulation (each edition) — 72 332 thousand items of periodicals and newspapers
Out of which:
· Newspapers — titles — 66
· Circulation (daily) — 4 512 thousand

Full time workers in culture in 1999

Full-time employed — 73 900 including men — 29 800, women 44 100 (general data based on representative research on the structure of salaries of

Culture industries belong to the economy sectors that experience the highest rate of job creation. Moreover, salaries in this sector are above average. For instance, in 1999 in the publishing houses as well as in the printing industry and companies dealing with the reproduction of old information carriers (that is in the biggest segment of Warsaw's culture industries) were nearly 10% of all people employed in the Warsaw industry and more than 3% of the total number of Warsaw employees. The average salary in this sector was 25% higher than the average salary in other industries in Warsaw.

The way culture businesses of all the branches are financed and organized has changed radically. The change has been based on the transition from the monopoly of the state to the market model, with a number of independent companies. In Poland, since 1999, 99.3% of such companies belong to the private sector of the market[4].

Some branches of the market, including press, phonography and film distribution are dominated by a few big private companies usually related with a foreign capital (oligopoly). There has also been a tendency to create monopolies in some market segments, for instance, in women press or mail order book sellers markets.

What is offered by culture industries constitutes today a major part of the supply of all culture products and services and plays a crucial role in shaping customer tastes, environmental esthetics and people's lifestyles. The character of the product is of a huge importance which has been confirmed by research on home budgets and the level of participation in culture. It proves that a major part of all expenditures on culture and of the time devoted to culture has been spent on the consumption of goods and services produced on an industrial scale.

In the circumstances of business liberty in Poland, producers and distributors provide diversified and attractive products that do not differ substantially from what is offered by the culture industries in the developed western European countries. The scope of the offer is indeed broad, however, its commercial and entertaining character as well as a tendency to promote foreign cultural patterns is a reason for considerable concern. Everything is available, so the question becomes: is it available to everyone? In such a situation, intervention by the state which would protect the national identity, secure high quality and cultural diversity of the product, also aimed at reducing price barriers in accessing cultural goods by the average consumer, is justified. For example, according to the research by Central Statistics Office (GUS) of 1996 due to an economic barrier 23.6% of households did not buy newspapers, 38.53% — weekly magazines, 33.5% — cassettes or CD's with music, and 26.93% stopped borrowing video tapes.

4
Information taken from the research on culture businesses in Poland carried out by the Department of Culture Economics at the Institute of Culture.

Registered
readers
(thousand)

Number of books
borrowed
per 100
readers
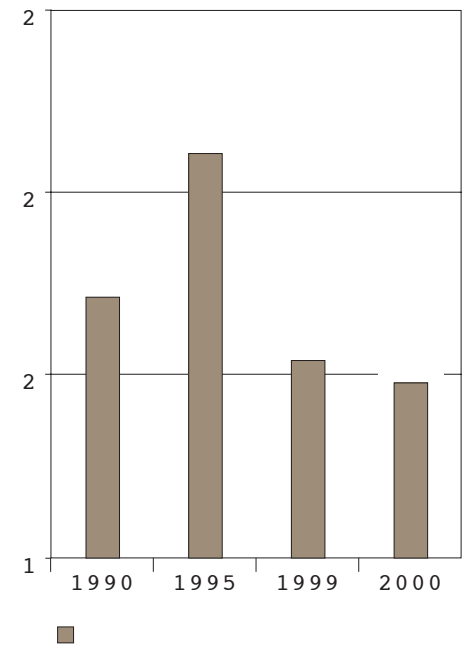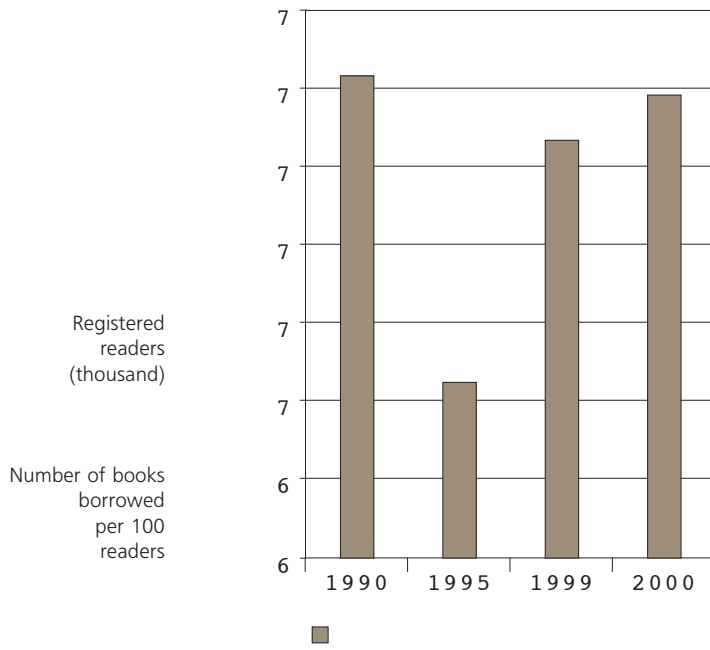
Participation in culture
Source:
Publications of Central
Statistical Office (GUS):
Statistical Yearbook of
the Republic of Poland 2000;
Culture 2000;
other materials
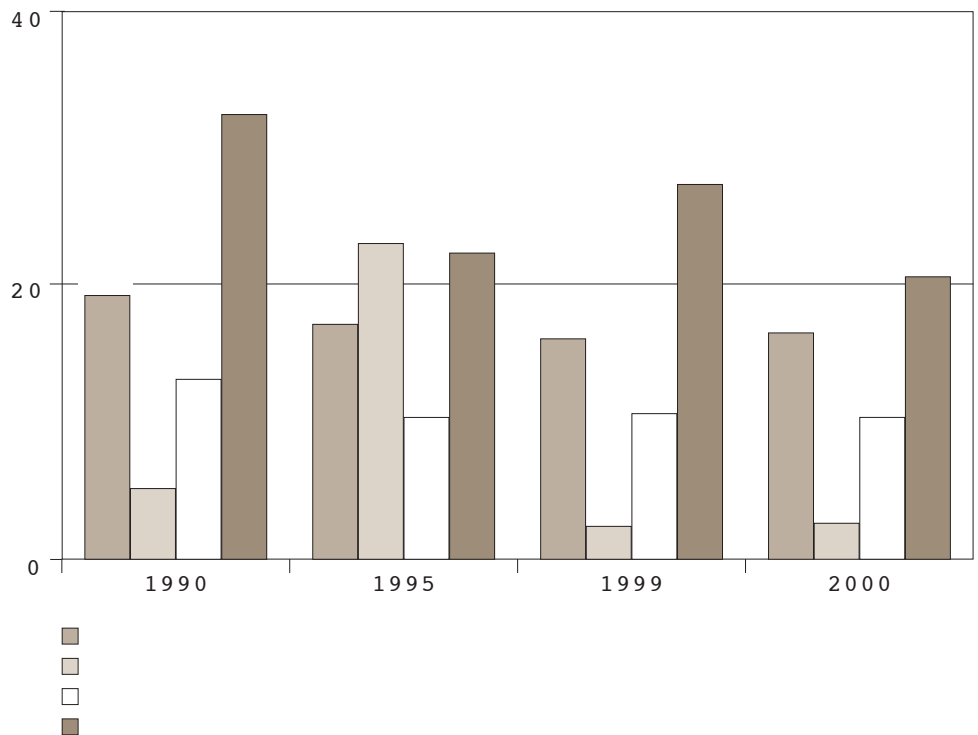
Today, new media greatly influence almost all areas of culture. This influence can be traced in the areas of creative activity, cultural activity, culture industries, culture perception and even culture policies. It does not mean, however, that this influence is the same for all culture areas. For example, new media have a noticeable affect on the operation of libraries and museums and will probably affect it even more in future. Their influence on the music concert or the theater is, however, rather minor.

One of the possible ways of looking at the influence of new media on culture emphasizes the notion of value chain, the term introduced in economical sciences by M. Porter in 1985. Value chain with regard to culture begins with creators (authors, artists), it involves all kinds of culture product creators (book, magazine, newspaper, CD and DVD publishers), then distributors and agents (eg., galleries, libraries, museums, entertainment parks), and ends with consumers, that is with a broadly understood audience, including critics and institutions which shape public opinion.

In fact, new media influence all elements in the chain, although at different times and to a different extent. Today, new media are most broadly used in distribution, because of an easy use of the Internet and associated technologies (www, chat, peer-to-peer communication). Creators and artists experiment with 3D graphics, virtual reality with its artificial protagonists taking the form of various avatars, they use the Internet for publishing poetry, prose or graphics, or as a media for discussion with their readers and viewers. They organize Internet events using reality show, or seek new forms of expression using multimedia (CDs and DVDs). It seems that once the period of getting used to the new technologies and experimenting with them is over, the interest of artists and creators in new media will grow. New media also address the users of culture products. It particularly involves the mass culture and younger generations of consumers. We are talking here of a broad range of products including walkmans and various games accessible on the Internet, mobile phones or sophisticated stations like GameBoys.

Mieczysław Muraszkiewicz

Influence of new media on culture

The state interventionism is based on supporting artistically valuable production that have a limited chance of financial success, co-financing the production addressed to a narrow group of receivers, and promotion of the domestic output. The state is involved in granting licenses to media which is done by the National Radio and Television Broadcasting Council (KRRiT). Apart from such direct forms of supporting culture industries, the state also introduced indirect forms of support such as 0% VAT, no customs duty on books, etc. This refers mainly to cinematography and books. State support would also be welcomed in the phonographic market (especially with respect to classical music and debuts) as well as promoting an access to the Internet.

We should discuss the future of culture industries in Poland in the context of the general debate currently going on in the European countries. In this debate, the influence of culture businesses on the social and economic development of all countries and regions is emphasized. The latest experiences and findings of different European cities and regions with respect to the development of culture and culture industries are being compared. Based on that we may distinguish between five policy models being applied by the public authorities in Europe with respect to culture and culture businesses:

- Nordic, based on socio-cultural traditions,
- Anglo-Saxon, with a dominating global market,
- Mediterranean, based strongly on cultural heritage,
- French, being the last European model based on state planning, and
- German, indicating the evolution from a welfare state to the information society.

The above mentioned models differ as far as the level of state intervention is concerned and also with respect to characteristic features of the culture policies applied in different countries. They are, however, similar in two aspects. Firstly, they share the belief that a wise policy with respect to culture and culture industries realized by public authorities will increase the advantages coming from culture. Secondly, each model emphasizes the role of culture and culture industries in creating new job opportunities.

The debate resulted in the acceptance of the Essen Declaration[5] which offers guidelines for the European, national and regional policies with respect to culture and culture indus-

5
The congress organized by: STADTart, ERICArts and the University in Dortmund that took place in May 1999 in Essen, was an important part of the European debate on culture.

tries. They are addressed to all VIPs whose decisions influence business, employment and culture. The most important guidelines are:

- culture and culture industries constitute an important element of the economy of each country,
- culture and culture industries create new job positions,
- harmonious development of culture and culture industries involves an integrated regional urban policy,
- regional development of culture and culture businesses stimulates individual initiatives and is helpful in competing with a mass, global consumption.

The above guidelines should be taken into account when planning the cultural policy in Poland so that it meets the demands of the global information society.

6.3 Kazimierz Krzysztofek
Challenges of globalization

The global culture may be described as a totality of goods and values (mostly symbolic) accessible anyplace and anytime. Pop culture, due to pop culture industries, has been exposed to the process of globalization more than any other area, as it produces symbols, which can be easily transferred through the Internet, satellites, or by means of electromagnetic waves. Today, we are witnessing an expansion of the market of symbolic values, which is mainly due to the market synergetic effect, telecommunications technologies, freedom of information and cultural transfers, and the affluence of the societies – which consume more and more symbolic values and goods. This leads to the globalization of the tools and in the range, but not necessarily of the content.

Some industries and businesses, following a world wide tendency, must enter the Internet environment, which is a consequence of the digital convergence. It refers mainly to media as well as anything that can be digitized or integrated into the Internet. Some industries, however, will remain outside the digital environment. They will contribute to live culture (including theme parks, or other forms except for the so called indoor culture), although it will obviously use, to a great extent, various technologies, including digital ones. The way the state will look at this sphere will bear great significance. Will the state let it be governed by the market (as it is the case nowadays), or will it try to affect and influence it having become aware of its fast growing importance for the development of the country.

According to a popular view, the rapid processes, like globalization, technology expansion and the development of the market (as the most important system of economic regulation) lead to the unification of culture systems, bringing *culture mundi.* It is to the detriment of the diversity of the world, which should be prevented by means of joint efforts on the part of the governments (public sector) and non-governmental organizations (private sector) in supporting pluralism. Major releases and actions of the United Nations or UNESCO (for instance of the World Decade For Cultural Development) have presented such a viewpoint over the last few years.

As a result of a growing digitization of culture industries there is an ongoing discussion regarding the efficiency and the functionality of the intellectual property rights protection system. The application of laws protecting intellectual property rights plays a crucial role with respect to culture industries as it is mainly the creative input which determines the costs and the market value of the culture industry products. The original content in the mass media process of production on the industrial scale, is the most expensive. The costs of the copies, equal the costs of carriers. This is a reason why piracy is so powerful, also in Poland, bringing in yearly profits of almost USD 170 million or illegally taking out of the industry that amount.

A closer look at the expansion of popular culture in the developed countries allows us to come up with an important claim. Namely, great economic and cultural areas (like production, consumption, lifestyle) are influenced in today's information society, not by the inven-

tions, which can later be used for the production of tangible goods (like cars for instance), but by the concepts and inventions which can be used for symbol processing. The computers, the Internet and the mobile telecommunication are good examples of such inventions.

Digitization and globalization of culture has serious consequences for countries like Poland, which are today rather "receivers" than "providers" of culture services. The problem of intellectual property rights' protection, as well as the limits of this protection, are the key civilization and culture issues of 21st century. Today's most intellectually developed societies make their living from and by nurturing innovative thinking and creativity. Without good protection of the intellectual property such countries loose the motivation to be creative. People have been creative for centuries despite the fact that there was no intellectual property protection. The pre-industrial culture emerged at the bottom levels of society and was not protected by law. Today's media culture is created by expensive industries and for that reason alone it requires protection. The products of imagination are treated as intellectual property. The Internet helps to avoid the restrictions related with copyrights which was proven by the example of Napster and complicates the electronic trade in cultural products.

The critics of the present system representing poor countries, who cannot afford culture production, point out that nothing comes out of nothing. In other words, they emphasize that what today is protected by law, is frequently just a transformation of the things that were created in the past, often by anonymous authors[6].

It has many serious implications for the development of culture. No doubt that the intellectual property should be protected, however, if the protection is too severe it may freeze the culture products to their initial form. Many communities still do not imagine how one can own culture, they regard it as a common property. It is expected, however, that soon, 5 or 6 copyright owners will control the whole culture transfer market. If so, they may be able to impose a "saleable style" on artists' creation which will best meet the demands of the market. What country with poor or no culture industries is able to compete with such monopolies?

There are today thousands of cultural goods that are distributed all over the world. But somehow many of those culture products undergo cultural "domestication." Many universal cultural goods were exposed to this process in the past, for instance religions, (the inculturation of Christianity or Islam), languages – Latin underwent vulgarization, as a result of which a family of neo-Latin languages emerged. By the way, the same thing may happen to the English language. Contacts between people always stimulated diversity. This diversity continues today not as a result of the cultures being resistant to changes and unification, but also, or maybe mainly as a result of, the impact of different cultures, the transfer of values and ways of life.

People all over the world want to be different and unique – that is why the international corporations, playing the major role in globalization, purposefully diversify their product offer. We deal today with the trade in culture diversity on an unprecedented scale. Let us take for example the food industry. Here, one thinks right away of McDonalds restaurants, which represents mass, uniform consumption. Yet, the food industry is not only fast foods. It includes also thousands of ethnic cuisines, which have been promoted for years, not as a result of advertising, but by food and restaurant critics, including sometimes even very serious writers. One makes money here not on the culinary taste – that is dishes themselves, but on the symbols and culture tastes.

Those phenomena contribute to the reduction of lifestyle uniformity. People expect more than one style, the city or the suburban one for instance. They want to experience different images, lifestyles, products, etc. which bring excitement and arouse interest. If in the post-mass society everybody wants to have the right to experience things in his or her own special way, then choosing a given culture artifact means that one wants to identify with it, even if it only lasts temporarily.

This is what brings the differentiation of culture as opposed to the processes leading to its uniformity. The above described model of globalization does not impose a restricted number of products or styles while eliminating others. It stimulates the process of a global diffusion of everything which is considered attractive. Of course, one might say that this leads to an artificial diversity of the world, that those Disneyland-like tastes, sounds, images, smells and the touches of different cultures, are just copies of the originals. Some people who do not have a broad knowledge with respect to the authentic local or regional cultures are not even aware of that.

6
J. Smiers, Freedom and protection. The impact of economic globalization on artistic cultures worldwide. Utrecht School of the Arts, The Netherland, (a typescript), 2001.

Thus, if we deal with the globalization of diversity, then it means that only such cultures which will be able to transform their values and cultural goods into "a show" and a marketable product will survive. The cultures which would not be able to do that will be museified and will loose their *Kultureträgers*. To sum up, it seems that the survival of a given culture will depend on whether it can be marketed. Therefore, the young generations of Poles today face an important dilemma concerning culture inheritance. If inheriting culture becomes more difficult through traditional socialization, then maybe the process will be facilitated when the culture is marketed The question is a bit provocative. However, the experience of some countries shows that even if the younger generations loose contact with the inter-generation transmission carried out in a traditional way, they later come back to their cultural roots owing to fact that they can use it in a different way or for different purposes. For instance, they translate their cultural heritage into shows or dramas for tourists, they sell "tastes and manners", music, dances, cuisine, traditional small-scale production, clothes, etc. This is how the fragmentation or the deconstruction of cultures is brought about. People extract from cultures only such images, tastes, smells, sounds, etc., which are suitable for promotion or considered attractive (yet they are already deconstructed). A good example of the above process is a Brazilian dance for couples called *lambada*. It became a part of the global circulation and returned to Copacabana beach in a transformed, more erotic and easily marketable version. The process of deconstructing culture, satisfying the needs of the international market, gives jobs to many people and brings considerable profits. It also brings satisfaction in that one is eligible for cultural cooperation with the world and is able to participate in the global culture transfers. If young Poles understand participation in culture in such a way it will mean that they will be able to familiarize themselves with the richness and diversity of the world cultures, mainly through their consumption[7].

We still need to answer one question – should culture be governed only by the market, or should it be supported by some international culture policy which would minimize all disadvantages and strengthen all advantages of varied cultures, without imposing undesirable regulations?

UNESCO documents stress that the pluralism of cultures should be protected. Diversity has its own value, it makes things more colorful and vivid — *varietas ludet*. Moreover, it is very functional, it preserves the permanent variety of life, to use the words of a Polish sociologist, Stanisław Ossowski. Different cultures inspire one another, exchange ideas and inventive solutions. There is a rapid growth of creativity and new innovative ideas and concepts are born. The authors of the UN World Commission Report, chaired by Perez de Quellar, titled *Our Creative Diversity*[8], understand well that when formulating development strategies we need to protect endangered cultures the same way we protect bio-diversity or endangered species. Ultimately, it is important, as these cultures provide a code, which makes it possible to understand them, enables a symbolic communication between different people which, in turn, makes it possible for cultures of various social groups to last for ages. If these cultures have survived such a long time, it simply means that they were helpful in the process of adapting to the challenges of the new time and environment.

The reluctance with respect to the market and culture consumption, being the factors regulating cultural identity, is brought about mainly by the fact that national elites in many cases have lost their authority to determine which values should be preserved and which ones should be exposed to changes. This is the main danger for small and medium-size culture markets, including the Polish popular culture market. Production for such markets is expensive and subsidy-demanding. Many countries just cannot afford it. Products released by huge global manufacturers are cheap. In addition, when they are promoted on the local markets a "culture dumping" is used by the manufacturing companies.

Here we touch upon the problem of the protection of the Polish cultural diversity. UNESCO international cultural policy as well as individual national cultural policies are not so influential as they used to be. They can have but little affect on cultural processes, due to the fact that more and more cultural goods are purchased from private producers. Maybe then, pluralism will find support on the level of the international market This, however, requires a partnership of all governments, non-governmental institutions and business.

It is all about a desirable influence of the global culture on the individual cultures, one which is not destructive. The aim of the Polish cultural and educational policies should be to provide the people within the reach of the global culture with all necessary means to

7
A. Fuat Firat, Consumer culture or culture consumed? In: J.A. Costa, G.J. Bamossy, Marketing in multicultural world. London 1993.

8
Our creative diversity. Report of the World Commision on Culture and Development. Printed in France, 1995.

fully participate in the national, ethnic, regional or local cultures. The role of the global culture should involve creation of a universal code of communication, used particularly in business and intellectual exchange in the multicultural world. At the same time the Poles must not abandon their own culture, because thanks to it, they will not feel alien in the global world. The role of the English language is very important. Its popularity should not be treated as a threat but rather as an opportunity to use the new *lingua franca* of the global era for dialogue between civilizations and the promotion of respective cultures. A general good command of the English language should be regarded as an important element for Poland's participation in the processes of globalization.

Obviously, the processes described above are not free from certain threats and drawbacks. Nevertheless they give Poland a chance to create an image of a pluralistic country. Many European regions, often remote ones, turn their economic diversity into profit. No local government in western Europe conceals the multicultural and multi-ethnical nature of its region. They even purposefully expose this diversity, not because it is in any way required by European standards but simply because it is profitable and stimulates development.

Thus, it can be legitimately stated that the vitality of the national and regional cultures, as well as of the European culture, depends on the ability to produce and promote cultures and their creators, through culture industries. Therefore, the involvement of the state, aimed at protecting national identity, securing a high quality and diversity of the cultural offer, as well as focusing on the reduction of the price barrier in accessing cultural goods by an average consumer, is fully justified.

It seems that Poland will face the biggest challenge, as an integral part of the global information society trying to include its own culture into the world culture exchanges. This process must avoid any extremes. The first would be a situation when the Polish inner culture is absorbed by the global one, the second being a temptation to protect the national culture from outside influences. In the open society the second threat seems unlikely, however, the first one is possible. If it comes true, it would impair the conditions for the national creativity. Thus, the best solution seems to be not to oppose the global culture, called metaphorically "McWorld" but to find a niche which could be used to preserve individual cultural diversity and multiplicity and would stand the test of time. Poland, with all its capabilities and ambitions, may, provided that appropriate actions are taken by the government, citizens and culture creators, contribute to the creation of the model of culture globalization free from the above extremes. The extremes resulting either in a monotonous homogenization of the world, or in its re-tribalization which may produce national, ethnical or local conflicts. It is in Poland's own interest – the open nation situated in the center of Europe – to support the process of the globalization of diversity.

6.4   Kazimierz Krzysztofek
Cultural context of the information society

It is hard to understand the nature and the developmental tendencies of the information society without knowing its socio-cultural context which plays a functional role for society and is co-produced by it. The developmental tendencies emerge in the centers of civilization and later are transmitted to their peripheries. Poland is now within a reach of such a culture.

It is difficult to talk today of the canon of culture, that is of values and notions which are known and understood by all people in the same way. A culture which participates in the global culture exchanges is not a hierarchical type of culture with respect to local (national, regional) ones. It becomes a metaculture characteristic for an exchangeability of the beauty and ugliness, falsehood and truth, good and bad, *sacrum* and *profanum*. Moreover, it comes with intellectual devaluation of the notion of text. Historic memory becomes more a cultural garbage than a cultural treasure. It is a culture without meta-

physics which has been replaced by quasi-metaphysics in a form of a marketed, primitive magic or astrology, as opposed to philosophy.

Today, spontaneity and creativity, have become the most valuable characteristics. Everything has to be creative. Personal development should be based on individual needs and possibilities, instead of commonly accepted and respected values and norms, simply because there are no such norms. People are experimenting with axiology and morality. Everybody has to experience everything alone and only then he or she can draw conclusions based on their own experiences as to how to act and what values to respect in everyday life. An individual should be always independent and find the meaning of life by himself or herself.

Changing personal identity is common today, just like its endurance was taken for granted in the past. Man feels a constant need for self-identification and self-actualization. The individual identities disperse and again integrate according to the scheme: integration – disintegration – new integration.

In a word, the identity of the multicultural and postmodern society is today more often a syncretic amalgamation of different elements reminiscent of a sort of a *bricolage*. We can actually buy a given lifestyle or any model of identity on the market. This is actually how people create their identity through choosing from a number of goods and services. All styles are allowed, eccentricity does no longer exists as the consumer market perfectly and quickly absorbs it.

Consumption is a form of fulfillment. People are encouraged to choose from a range of real and unique personalities, which for members of the consumer society is a manifestation of their freedom. Calls for self-creation and self-reliance go along with new ways of accepting a desired identity through consumption. New identities promising full satisfaction are consumed, whereas the old ones, which turned out to be disappointing or conventional, are rejected. In such circumstances the identities become more changeable, fleeting and flexible. It all encourages an individual to createone's identity, yet how should it be done when there are but few people who are certain that they fully control their own lives[9]?

The increasing number of opportunities brings about the threat of restructuring, fragmentation and dissolution of human bonds. An individual with no past and no future, being born again and again – such a person perfectly fits the model of a culture which blends and transforms identities. Local cultures are exposed to messages, images and patterns of behavior of such persuasive power that exceed everything that could have been created by the members of the local communities. The role of local leaders and their influence on the local communities has diminished. Today's small communities do not create culture (having roots in their lives, work and experiences) for their own needs to such an extent as pre-modern societies had done for centuries. In other words, they lose the ability to look at themselves through the perspective of their own culture. The communities are exposed to the commercial offer prepared by professional specialized pop culture producers, which is difficult to resist.

An individual is no longer identified through his or her affiliation, he or she is no longer a part of something else and wants to enjoy the status of a "main protagonist". Democracy, like religion, no longer provides such control mechanisms that would guarantee the stability based on the consensus of values. It becomes purely procedural. Today we know what the control through culture, to which an individual belongs, looks like. We know less, however, of the mechanisms of the control through the culture which is consumed by an individual. Many things indicate, however, that the main trouble areas of the social control through a culture which is absorbed rather than participated in can be spotted on the market today[10].

To sum up, we may say that the individualization of consciousness and identity is brought about by many factors. They are generally connected with the postmodern breakthrough revolution. The concept of an individual in the late-capitalistic, information society stimulates and emphasizes his or her creativity. It also promotes values which can cure fanaticism, protect us from ethnocentrisms, intolerance and prove helpful during the process of the adaptation to the market and the model of an open society. Such a culture possesses therapeutic values, teaches openness, a life without blockades. It incites a need for achievements, teaches how to look into the future without a continuous brooding over past mistakes, and finally requires new forms of innovation and adaptation. On the other hand, such a culture is not free from drawbacks. It reduces a social capital embedded in interpersonal bonds, disintegrates nations, weakens the mechanisms of social self-regulation and self-organization. It also does away with the community sanctions imposed on community members who breach the canon of community values, being a form of a social self-control.

9
K. Krzysztofek, Konsumpcja kultury czyli wdrażanie do ról przez rynek [Cultural consumption: training to take up the roles according to market demands]. Kultura Współczesna, 1998 [in Polish].

10
R. Shusterman, Sztuka życia a etyka postmodernistyczna [The art of life and the postmodernistic ethics]. Kultura Współczesna 3-4, 1996 [in Polish].

Education

7.1

Witold Abramowicz
in cooperation with: Włodzimierz Gogołek,
Janusz Stokłosa, Maciej M. Sysło

Citizens of the global information society

On the way to the global information society every citizen of Poland should work out his or her own model of using and benefiting from information and communications technologies and resources. The fact that most Poles still do not have such a model can be attributed to many social, economic and culture factors. Therefore, it becomes an important challenge for the state to come up with social, education and infrastructure mechanisms which will make all people aware of the necessity to work out such a model, and will provide a number of options to chose from.

- **Self-informing citizen** must be acquainted with information and communications tools to such an extent that he or she is able to acquire the information which:
  — he or she needs in a given time and place and only such,
  — is up-to-date,
  — is credible,
  — is absorbable – which means that it is received in such a form that it does not need to be further processed by a self-informing citizen.
  For instance, a self-informing citizen is able to efficiently handle Internet search engines.
- **Communicating citizen** is a self-informing citizen who, in addition, can communicate with other people in an electronic way. The aim of such communication may be either professional or personal The people with whom a citizen communicates may represent other cultures.
- **Citizen educating himself** is a communicating citizen who acquires knowledge that determines the quality of his professional and private life with the use of information and communications tools. For example, an educating citizen can determine his or her current as well as strategic information needs, which can be satisfied by means of electronic knowledge sources known to him/her.
- **Creative citizen** is an educating citizen, who can create digital products or provide digital services which meet the needs of self-informing, communicating and educating citizens.

The above models are not mutually exclusive. They are only ordered according to the increasing competence level. For example, a citizen educating herself possesses all the characteristics of a communicating citizen and some additional ones giving him an advantage.

The information society will be competitive provided that its economy is based on knowledge. The key to knowledge is education. That is why the level of the education of the society cannot be regarded only as an individual affair of the citizens. If the state wants its society to be competitive in relation to other societies then education must be treated as a strategic goal for the whole nation.

7.2   Witold Abramowicz

Self-informing citizens

To become a *self-informing citizen* it is necessary to know how to communicate with computerized devices like computers themselves, phones, TV-sets, or sophisticated home appliances. Obviously, not everyone will consider a microwave oven, central heating system or a car radio as a computerized device. However, all those appliances contain embedded microprocessors, so communication with them is governed by similar rules. The alphabet of communication languages with those devices comprises not only digits and letters but also graphical symbols – icons. Thus, these languages require both linguistic skills and an ability to use abstract notions. Teaching those languages seems to be an ambitious undertaking if one takes into account the difficulty in understanding just a lexical part of a television broadcast or interpretation of a simple chart by a significant part of the society, not only Polish society. The problem is even harder, because those languages are often dependant on a given device, so they do not use one standard alphabet of symbols and notions. Moreover, they quickly evolve. The experience of mobile telephone operators in Poland shows that Poles are more interested in telephones featuring simple and easy-to-use communication interface than citizens of other European countries. The disaster of WAP standard deployment shows that people do not want to be informed in an inconvenient way.

A keyboard is the main means of communication with a computer. Students being able to touch-type are in minority. How work efficiency could be improved in Poland if typing speed of 200 characters per minute was a common skill It is astonishing that so few countries include typing as an obligatory skill for a secondary school graduate.

To become a *self-informing citizen*, it is necessary not only to use information searching tools efficiently, but also to express information needs properly. To this end the use of foreign ontology systems is necessary, which are common for electronic sources of information. The educational system has to deal with this challenge. Understanding foreign ontology systems is a way of understanding other people; it is a key to tolerance and cooperation. It is necessary to train people in using complete ontology systems like classifications, taxonomies or thesauruses. They are often applied in query languages of simple syntax. Simple syntax does not necessarily mean "easy to learn" by an unqualified user. A lack of such skills may reduce the role of the Internet to yet another information source for weather forecasts or sport results. This phenomenon is already observed in countries where an access to the Internet in households is pretty common, however, the users repeatedly access only few web sites.

An ability to read and write in a mother tongue in a precise and unambiguous way is a necessary condition for becoming a *self-informing citizen*. Unfortunately, many people even with a university education do not meet this requirement. It is particularly dramatic when taken into account the small percentage of people having university education. What, in such circumstances, can be expected from people of a lower level of education?

For the majority of Poles, the access to information is determined by whether the information is in Polish. On the other hand, Polish culture, the achievements of Polish science, technology and industry will not be made known in the world if they are not presented in foreign languages, especially in English. The role of the state is to finance the research on automatic translation of selected global information sources into Polish, and Polish information sources into English and, at a smaller scale, into other popular languages. To a certain extent this process will accompany the integration of Poland with the European Union. Translation will require inventing linguistic equivalents in many areas.

An urgent need is creation of a national electronic library. Only the government can take on that responsibility. National cultural heritage, which will not be accessible via the net, will be used less frequently. Telecommunications provide the cheapest and the fastest access to information, so accessing information via the net will become dominant.

Gra˝yna
Staniszewska

Interkl@sa Program

The main objective of the Interkl@sa Program is to popularize computer and Internet skills in order to prepare a young generation of Poles for the information society.

The program was founded in 1998. For four years it has continued irrespective of political divisions under the auspices of the Parliamentary Commission for Education, Science and Youths. As a result, a total of PLN 283 million from the state budget has been spent since January 1998 up until the end of 2001 to purchase more than 7 thousand Internet laboratories equipped with approximately 75 000 computers with basic and educational software installed. In 2002 the last junior high schools will be equipped with Internet laboratories. Last year the program also reached secondary schools.

During the above period local governments have trained more than 20 000 teachers who work in the schools that received Internet laboratories. In 2000 Intel-Teach to the Future teachers training program (devised by Intel and co-financed by Microsoft) aimed at the use of computers in various disciplines was introduced in Poland as a part of the Interkl@sa Program. Within this program, until the first half of 2002, 80 000 teachers have been successively trained in a cascade system. There is a chance that the Intel-Teach program will be continued for another year. Noncommercial Polish Education Portal — www.interklasa.pl is being supported by Polish-American Freedom Fund.

The Interkl@sa Program is not limited to building hardware infrastructure and training teachers. The program also promotes the schools which prepare their students well to function in the information society according to the standards accepted in the European Union. If a school is awarded the Interkl@sa Quality Mark, it means that both the teachers and students use computers and the Internet to search, select and then use the information they need; the school library provides access to the Internet and other multimedia information sources; the staff room is equipped with computers at the disposal of teachers who can use them for instance to prepare a lesson; the students take part in inter-school contests, where computers or the Internet are a part of contest tasks or their solutions; finally, the students have designed and maintain the school web site.

Another aim of the Interkl@sa Program is to open school Internet laboratories to local communities, so that they can be used as centers of training, promoting local communities via the Internet, the implementation of ecology projects and programs for the disabled, as well as information centers during referenda and elections. Thus, Interkl@sa Program aims to transform school libraries into multimedia information centers.

A good example of the initiatives awaited by local communities are the European Information Centers, which use the infrastructure of the school computer laboratories to promote reliable information on the European Union at the local community level, particularly in rural areas. During just a few months of 2001 more than 200 European Information Centers were founded. The total of 2 500 such centers are expected by the end of 2002. The Interkl@sa Program in cooperation with the Union of Polish Poviats[1] has been funding the Local Computer Science Academies located in high schools. Those academies offer courses in the most demanded computer engineering professions. Their graduates receive certificates respected all over the world. By the end of 2001, a 100 such academies had started ope-

No one, except the Poles, is interested in the automatic processing of the Polish language. Without appropriate research, development and deployment, Poles will not be able to take advantages of modern software tools. It will be impossible to effectively integrate the national electronic library with the global information resources. Polish regions will be less involved in the information exchange in comparison to other regions of Europe.

The role of the state is to ensure that the Polish language is represented in the information resources of the global information society to the same extent as the languages of other countries of a similar significance. It is also a necessary condition for maintaining good contacts with Polish diaspora and descendants of Poles leaving abroad, who wish to preserve close relations with the Polish culture.

1
„Poviat" is a Polish administrative unit, bigger than „gmina", which is the smallest administrative unit, but smaller than province.

Jerzy
Wysokiƒski

Internet at
schools
— Project of the
President of
the Republic
of Poland

" he position of Poland in the fam-
ily of democratic countries and
its place in the global economy will
depend on our active participation in the
information society. This is the reason
why we have to put emphasis on educa-
tion, higher education and the develop-
ment of scientific research. Fast and
widespread informatization is vital now.
This is the only way we can improve the
efficiency and competitiveness of our
work. This is how we can make our lives
better in Poland". — said the President of
the Republic of Poland, Aleksander
KwaÊniewski.

President's initiative — INTERNET AT
SCHOOLS — PROJECT OF THE PRESIDENT OF RP is
a nationwide enterprise aimed at bro-
adly understood popularization of infor-
mation technology among school pupils
and university students. The program is
carried out together with
Polish Fund for Science Popularization
(Polska Fundacja Upowszechniania Na-
uki) founded by the Polish Academy of
Sciences. The program is financed from
non-budgetary sources.

Despite the state's budgetary
expenditures on computerization, many
schools still do not have computer lab-
oratories, today being a very important
means of equalization of chances in
educative processes. An access to
modern educational tools that enable
searching and selecting information as
well as an ability to use the latest tech-
nological achievements are necessary
conditions for the successful profes-

sional development of young people.

The main objective of the program is
to equip schools with complete, multi-
media computer laboratories. By the
end of 2001, within the INTERNET AT
SCHOOLS — PROJECT OF THE PRESIDENT OF RP
program 118 computer laboratories
were set up in schools throughout the
whole country attended by 61,000
pupils and students.

Another aim of the program is to
promote new technologies among
young people through nation-wide proj-
ects and contests. Their purpose is to
maximize the use of the existing com-
puter infrastructure and to arouse
interest in new possibilities of comput-
er applications. There are two contests
organized for high school pupils as a
part of the INTERNET AT SCHOOLS — PROJECT
OF THE PRESIDENT OF RP. The first one is
called Euro-Schools on the Internet. In
this contest, pupils design, maintain and
update a school web site. The second
contest also addressed to high school
pupils, organized in cooperation with
Warsaw Stock Exchange, involves simu-
lation of stock exchange investment. It
is aimed at increasing a general invest-
ment knowledge among high school
pupils as well as encouraging efficient
use of the Internet.

In January 2002 during an official
ceremony summing up program activi-
ties in 2001 the president of the Repu-
blic of Poland said — The ability to use
information technology in the economy
is of key importance. Information tech-

Poland has to give a chance to everybody to become a *self-informing citizen*. Otherwise, in the very near future, a significant part of the Polish society de facto will be unable to exercise their rights and observe their citizen obligations. It will be difficult for uninformed people to choose and use the best products and services. Therefore, their living costs will be higher than those of *self-informing citizens*.

Poland is a country of unequal repartition of possibilities for becoming *self-informing cit-izens*. To notice the disproportions, it is sufficient to compare the chances of people com-ing from the lower classes versus the elite classes, or rural areas versus urban areas. There is a high correlation between children's educational aspirations and the level of education and the income of their parents. The Polish "minimum program" should be a fight against such correlations by providing everyone with an equal opportunity to become a *self-inform-ing citizen*. Otherwise, poverty enclaves in Poland will continue in rural areas and in the areas of post-communist blocks of flats. Also the effect of the inheritance of poverty and unemployment will intensify.

Finding a solution to the aforementioned problems is just a necessary condition for becoming a *self-informing citizen*. A much harder problem consists in motivating people to become *self-informing citizens*. This motivation combined with self-motivation, followed by the real ability to self-informing, divides societies into the "informed " and "uninformed ". Schools should be responsible for arousing the curiosity of the world and teaching how to nourish it in order to create a habit of permanent acquisition of new knowledge.

7.3   Witold Abramowicz
Communicating citizens

In the global information society the English language is a new *lingua latina.* Until recently the passive knowledge of the English language seemed to be sufficient. Today, a self-informing citizen must be able to write in English – formulate queries to information systems, and maintain correspondence with partners operating all over the world. In the very near future voice communication with information systems will become common. The first such systems, as well as the most advanced ones, communicate in English only. They have a very limited tolerance for pronunciation and syntax errors. Poles are aware of the importance of speaking English. Unfortunately, the level of English language education is not too high.

The better the command of English, the greater the chances that a *communicating citizen* will fully benefit from his or her global status. It does not change the fact that the mother tongue will be the dominating language of the information exchange in each country. This is why learning any new language will increase the participation of *communicating citizens* in the global information society. For Poles, the languages of our seven neighbors will play a particularly significant role. *Communicating citizens* who know rare languages will be able to increase their competitiveness in the job market, provided that it is not their only qualification.

Communicating citizens must not only be able to find sought-after information using software tools, but also to store it in the information system so that it can be found and used later. Modern information systems facilitate recording the actions of the users through *personalization* or *profiling.* A *communicating citizen* should be aware of personalization and profiling processes. It is easy to understand personalization based on surname recognition. It is more difficult to predict the consequences of personalization based on the analysis of answers when filling in a questionnaire. Using personalization based on rules, segmentation, and preferences requires a broad knowledge of economy, psychology and sociology. Thus, there is a need for education with respect to the information freedom that should be provided to individuals, as well as to different social groups.

A *communicating citizen* must not only be aware of the linguistic aspect of communication but also of its cultural context. This mainly refers to international communication. Common awareness of a large number of cultural codes contributes to the liberalization of their use.

Significant problems may result from Poles' insufficient knowledge of their own code used in electronic communication, even when corresponding with people of the same culture. Today's electronic communication mainly consists of the written form deprived of body language, voice intonation and other features characteristic for direct and synchronous communication, which significantly improve mutual understanding of communicating parties. Unless multimedia communication similar to direct communication becomes cheaper and more popular, different kinds of textual communication will dominate. Today, the most popular is e-mail communication that is an asynchronous dialogue. A sender sends a message that is received almost instantly by the receiver. The receiver reads and processes the message at a later time convenient to him or her, so the response reaches the sender with a shorter or longer delay. Such form of communication requires a high precision of expression. This is why the educational system should put emphasize on teaching clarity and precision of expression, and focus on dialogue forms.

Learning how to use new software and hardware tools will not be the biggest problem for *communicating citizen*s, because proper training will be provided by their producers. Moreover, modern software and devices become more and more user-friendly. Designing a workplace comprising many tools will be a more difficult task for any *communicating citizen*. Development of individual work procedures, when technology is changing so rapidly, will be a great challenge for *communicating citizen*s. Poles who will fully earn their title of *communicating citizens* will need to reject the stereotype of poor work organization as being a Polish national characteristics. *Communicating citizens* must be able to manage

their time observing the priority of tasks they have to perform. For that purpose, they need to control communication processes to acquire only useful information.

Communication is expected to become a dominating form of work. It will be particularly important in a society where there will be no clear cut distinction between working hours and leisure time. More often one employee will provide services to several employers for short periods of time. Becoming a *communicating citizen* will be a necessary condition for being competitive in the job market. If Poland wants to avoid a situation where *fewer and fewer people have more and more work to do*, **the educational system has to teach cooperative work skills to the highest possible number of people**. This includes: the definition of common goals, negotiating techniques to achieve the goals, responsibility for the quality and timekeeping of the work performed by each member of the team, and finally – loyalty to the team. Poland needs as many *communicating citizens* as possible. Only a society of *communicating citizens* will be aware, efficient, and cheap to organize.

The vital processes   for becoming self-informing and *communicating citizens* must include all people regardless of their age, sex, education or profession.

7.4   Witold Abramowicz
Citizens educating themselves

Poland should be a country of as many *citizens educating themselves* as possible, moreover, educating over their lifetime. Naturally, the life-long learning of adults must be preceded by school education of children and young people youths, thus providing an appropriate basis of knowledge and skills.

All people with university education must be *citizens educating themselves*. Outlays on education are too high to break the continuous educational process and waste past expenditures. In today's model of education one can complete university education in his or her twenties. In the case of many professional groups university education has to be supplemented with a formally achieved practical education confirmed by diplomas often related with specific products, certificates issued by professional associations, etc. (for instance: medical doctors, lawyers, computer engineers). The acquired knowledge becomes obsolete in a shorter and shorter period of time. To use an analogy taken from nuclear physics, one can say that for a number of professions, the period of "knowledge half-life" only takes a few years and is gradually becoming even shorter. The period of a professional activity has also gradually fallen (for instance a forty-year-old software engineer has rather low chances of finding a job).

Not only people with university education should be *citizens educating themselves*. It would be the best for Poland if all working people become such citizens, because they will better predict the consequences of their actions, they will be more aware of their participatory role in the overall share of work, and they will participate consciously in the social life.

It is important to be a *citizen educating himself* independent of the formal education level, because of the educational products accompanying even the simplest products and services. For instance, a producer of wall paints attaches information on how to best use them. The Internet is the cheapest and the most efficient way to propagate the best practices of materials, tools and technology applications.

Only *citizens educating themselves* will be able to recognize the deficiencies of their knowledge, determine their needs for future competences that will provide them with a competitive advantage in the job market and personal satisfaction, as well as choose the proper ways to achieve life goals. The global information society and electronic economy will require employees' creativity, interdisciplinarity, self-reliance and cooperation. These skills are, however, not what the present educational system focuses on. Schools and universities require students to master a given part of knowledge rather than practically deploy knowledge or create new knowledge. It is not the aim of this report to resolve the dispute

Jerzy
Da∏ek

Computers at schools — statistics

D ata presented in the figures come from the poll conducted in Polish schools by the Ministry of National Education in 2001. The poll covered:

- 11 931 out of 16 766 elementary schools that is 71%
- 4 536 out of 6 295 junior high schools that is 72%
- 1 333 out of 2 292 high schools that is 58%
- 2 014 out of   5 909 vocational high schools that is 34%.

	No. of schols	No. of schools equiped with computers	No. of schools with the access to the Internet
Elementary school	11 931	8 512 (71.3%)	4 747 (39.8%)
Junior high school	4 536	3 562 (78.5%)	3 195 (70.4%)
High school	1 333	1 132 (84.9%)	972 (72.9%)
Vocational school	2 014	1 736 (86.2%)	1 498 (74.4%)
Total	19 814	14 942 (75.4%)	10 412 (52.6%)

	No. of computers	No. of computers in laboratories	No. of computers in classrooms	No. of computers in school libraries	No. of computers in administration	No. of computers in staff rooms
Elementary school	68 127	52 603	3 529	1 799	9 499	697
Junior high school	43 626	37 165	1 059	859	4 275	268
High school	21 330	15 950	1 182	885	3 073	240
Vocational school	41 723	29 350	4 142	1 358	6 509	364

	Total No. of computers	No. of computers sponsored by local depart. of education	No. of computers purchased from school own resources	No. of computers sponsored by local governments	Other sources
Elementary school	68 127	16 276	22 614	11 413	16 190
Junior high school	43 626	30 457	6 294	3 616	2 843
High school	21 330	3 100	10 185	2 147	4 539
Vocational school	41 723	4 188	22 037	2 421	10 794
Total	174 806	54 021	61 130	19 597	34 366

	Analog connection	ISDN	Fast modem access	Fixed connection
Elementary school	3 684	565	382	229
Junior high school	1 986	678	471	195
High school	407	113	305	222
Vocational school	760	172	413	268
Total	6 837	1 528	1 571	914

between essentialists and encyclopedists over the way children and young people should be taught. The fact is that schools and universities teach narrow specialities instead of the interdisciplinary knowledge expected by the global information society. Today, by "self-reliance", independent problem solving is understood, whereas **the global information society will need more people able to define problems independently, and then participate in their solution**. Today's educational system does not develop the abilities of students to cooperate with other people, even specialists of the same profession, not to mention those of other professions. It is worth noting that at present really valuable results are achieved only by teams of collaborators. Nevertheless, we should be aware that there will be certain social groups uninterested in creative professional attitudes. These groups cannot be marginalized. However they will have to accept that their chances in the job market will be much reduced.

Witold
Abramowicz

Computers
at schools

he number of computers and software tools in Polish schools has risen significantly over the last few years, due mainly to the Interkl@sa Program, supported by local governments, teachers, school administration bodies, and parents. Particular role is being played by teachers. Without their engagement and determination, the number of computer laboratories at schools would be much lower. Other countries, however, particularly the wealthy ones, have set forth even more ambitious plans that Poland could follow.

According to the research conducted in 2001 by the Ministry of National Education, a statistical elementary school in Poland is equipped with less than six computers. They are bought in most cases by the resourcefulness of school headmasters — from the money coming from the schools' own funds, or funds coming from the sponsoring companies and local governments. In most cases one of these computer is used for the purposes of school administration. The access to computers in staff rooms is incidental.

Bearing in mind teachers' low salaries it is highly probable that teachers do not use computers at all (because they simply cannot afford them). Less than a half of computers in elementary schools are connected to the Internet. In most cases the access to the network is provided by modems. It remains a mystery how the headmasters of elementary schools are able to finance access to the Internet. Support provided in this matter by Polish Telecom (TPSA) is based on sponsoring a given connection time. It is of course important, yet, it is rather aimed at stimulating a potentially huge market than a free way of providing access to Internet resources.

The number of computers is higher in junior high schools and even higher in high schools. Yet, it does not mean that the situation is satisfactory. A number of 10 computers per school (that is for a few hundred pupils) means that an average access time to a computer per pupil equals only a few minutes a week! Only in junior high schools the state appeared the most significant founder of computers. One may conclude that the Polish government does not

Being aware of the above phenomena and finding one's own way of life is very significant for *citizens educating themselves* as their constantly updated knowledge will secure and influence their place in the job market. This is particularly important when an employee becomes an entrepreneur and starts working not for one employer but for many customers who need his or her services. Entrepreneur-customer relationships are definitely less permanent than employer-employee ones. Each time, before a new entrepreneur-customer relationship will be established, entrepreneur skills and competences will be evaluated. This may lead to a situation where a person will be forced to change his or her occupation several times during a lifetime. Of course, a farmer will probably remain a farmer, a writer will remain a writer, etc., but the methods used by them in their professional work will radically change, moreover – will change several times. This is a reason why *citizens educating themselves* will need life-long learning. Their position in the job market will be determined by their actual skills and competences instead of the name of their profession.

The employer's attitude to the employee's continuous education is an open question. There are at least a few options here:

- education is a private matter for an employee,
- education is an integral part of the job – *training on the job*,
- education is based on training carried out in isolation from the employee's occupation, in special centers.

The role of the state is to provide possibilities of efficient training and education to its citizens. The efficiency measure is the ability to perform a job which contributes to the creation of competitive products and services that may be sold on the global market. The competitiveness factor must be considered both in the short and long term. Therefore, an appropriate model for the financing of the educational system is needed. It must involve all interested parties: employers, employees, local governments and the state. Without their involvement, they will be not properly motivated. The financing model of the educational system must cover a period of at least 10 years. This is a long enough period to develop both professional strategies by the employees and far-reaching business plans by the

employers. Such a system has to be addressed to ordinary people who must understand and accept it. In fact, this group of people determines the success of the whole state. The top 10% of society understands the educational problems well and is prepared to survive under all circumstances.

In 1992 the ratio of the employed to the working age people was higher in Poland than in Ireland. Today, this ratio in Ireland is 50% higher than in Poland. This is partly a result of the national education program which has been recently introduced in Ireland. The most efficient way to achieve such success is to create a similar national education program in Poland and to promote a general attitude of *citizens educating themselves*. Otherwise, many Poles will still try to survive on social benefits or disability pensions.

Due to the increase in life span one can expect that the part of life after the period of professional activity will become longer and more significant. The weakening emotional bonds in families will contribute to the reduction of the importance of grandmother's role as a babysitter. Also more and more men will live long enough to face the problem of what to do in their free time apart from focusing strictly on survival issues. *Citizens educating themselves* are more likely to achieve a high life status at such age, and as a consequence, they will be able to extend their lives even more. Such citizens will be able to expand their knowledge in disciplines that have nothing in common with their profession, but which belong to the scope of their interests. They may also use their professional knowledge for the benefit of social, nongovernmental organizations. Finally, instead of ceasing their professional activity completely, having reached their retirement age, they may gradually reduce it. The experience of many countries shows that such people are particularly valuable employees who identify themselves with their jobs, pay great attention to the quality, and do not consider economic profit as the priority. Taking into account a disadvantageous demographic situation, this social group may play a particularly important economic role in Poland.

7.5   Wojciech Cellary
Creative citizens

Educating *creative citizens* is a real challenge for the educational system in Poland. The notion of *creative citizens* includes not only artists and scientists, but also all inventors, constructors, designers and entrepreneurs. Constructors and designers create new products and services, both tangible and intangible; while entrepreneurs create new business models and new methods of achieving business goals.

The need for educating *creative citizens* stems from the demands of the electronic economy. As mentioned in the chapters on the economy and the job market, there will be a growing demand in the market for intangible services of a strongly individualized and per-

In Poland, one disabled person in ten starts but does not complete education at the elementary school level. Approximately 57% have completed education on the elementary school level and only 3.7% have completed university education. There are many reasons why the above statistics look so pessimistic: architectural and financial barriers, difficult access to teaching materials and information, and most important — psychological barriers created by the society. Distance learning through the Internet provides the disabled with a great opportunity of educating themselves. Learning can be achieved by accessing special web sites which include multimedia teaching materials and CDs with recorded lectures in a textual and multimedia form. Students are examined at special meetings, or via videoconferences, or at the disable student home personally visited by an examiner. Distance learning provides the disabled with an opportunity to acquire the desired knowledge and skills, which is a fundamental aspect of both social and professional rehabilitation. It also pre-

Konrad
Frankowski

Education
of the disabled

sonalized character. A person providing such services cannot act in a routine way, therefore he or she must be creative. We do not necessarily mean a "great creation" – scientific or artistic – such a creation will be always reserved for the elite. We speak here of "everyday creation", required in work done for an individual client.

In the industrial society the general aim of the national educational system was to "educate the society". In Poland great progress has been achieved in this respect over the last decade. Both public and private educational institutions contributed to this progress. However, if we take a closer look at the educational system in the industrial society, then we notice that its goal is to teach society *how to use knowledge.* In the information society its main task will be to teach the society not only how to use knowledge, but *how to create knowledge.* Conventional knowledge, available to everyone, will be a necessary condition for being considered in the job market. This is unconventional knowledge that will be vital for being competitive in the job market. Let us note that the most unconventional knowledge is that of its creator.

Therefore, the utmost goal of the educational system is to teach pupils and students how to become innovative and original. Pupils and students should be praised for manifested originality. This goal requires new methods of teaching and a completely new approach to training teachers starting from those involved with the youngest children in education. At present, only Ph.D. studies represent a type of education which is aimed at stimulating creativity. However, the number of Ph.D. students constitute a very small percentage of all educated people. Moreover, methods of education applied to Ph.D. students, which mainly consist of individual contacts with the supervisor, cannot be broadly applied. This is why significantly new education methods need to be devised. They should stimulate creativity by team work and cooperation through the Internet due to its low costs and wide-spread reach.

7.6   Witold Abramowicz

Education tools for the global information society

Gutenberg's invention of the printing press enabled a large scale , thus, cheap means of distributing information. Each printed matter requires, however, a tangible information carrier. Electronic media release us from the above requirement, because they allow for multiple information recording on the same carrier and remote access to information. The Internet, and in future the information highway, may become the new, cheap and efficient education media. The future Internet will probably be much more developed than the one we know today. The development goes towards understanding information by a machine. An information system will be able – among other things – to understand the needs of a citizen educating himself. There already exist systems – for instance *web mediated* – where a user may select and negotiate a personalized information package related with a given lesson topic. Such an approach requires, however, further thorough research aimed at the development of new pedagogical methods. Naïve, direct application of the Internet to current pedagogical methods, which have been worked out centuries ago, and which assume a central role of a teacher, are bound to be unsuccessful.

The needs of citizens educating themselves require a radical transformation of educational models, including for instance, the education of not only children and young people (which is the case now), but also of adults. Without thorough institutional changes within the education system the possibilities provided by digital technologies will not be fully exploited. Simply, the information society will not include Poland, so Poland will again experience a civilization setback.

Today, digital contents including CDs and the information stored on the Internet are commonly used in the same way as traditional audio-visual techniques within traditional

Universities of today	Universities of tomorrow, i.e. universities of today plus:
Students = young people	Students = adults
Students with no professional experience	Students with professional experience (often an extensive one)
Teacher knows what a student is supposed to learn	Student knows what a teacher is supposed to teach him
Teaching fundamentals	Teaching problem solving
Intramural studies – a student attends	Distance learning – a student studies

forms and methods of conveying knowledge. Such qualities as: independent research , independent problem setting and solving, and collaborative work are not being taught, though information and communication technologies provide opportunities for that. A school today, as an institution, teaches skills and develops pupil attitudes which are contradictory to the expectations of the information society. Elementary and high school teachers draw up methods of incorporating digital contents into traditional educational programs, based on traditional assumptions. This is easy to check by having a look at the Internet discussion lists, where teachers share their professional experience. However, no one stresses the following:

- exceptional flexibility of digital information that enables an arbitrary choice of the teaching program contents, composing it of different modules, and easily associate external information sources,
- interactivity which enables learning through activity,
- broad access to the world-wide information resources which makes it possible to extend the teaching program with extraordinary contents,
- Internet communications providing time flexibility and adjusting the pace of study.

One of the barriers to free development is the fact that teachers are obliged to stick to rigid program directives and to follow the so called minimum educational program.

Internet sites devoted to education, which are financed by public resources, prove that official education programs like e-school are implemented in a technocratic way.

In the information society university education is most likely to divert from the Humboldt model of a university being a common place of research and education, financed by a sovereign and lacking competition. Educational tools of the global information society will provide democratization of the access to knowledge. Students will no longer be attached to one place of study. They will probably control their education processes by combining modules offered by different universities. Similar to companies, universities will focus on activities providing competitive advantages. Using the same analogy with companies, a number of classes will be *outsourced* by a university to other universities as well as enterprises selling knowledge as an added value to their products and services. It all involves technology which is already at hand. This is why such a model of education should be legalized as soon as possible in Poland. It will enable Polish students to take advantage of the education offered by renowned institutions at a reasonable price.

It is necessary to maintain the good reputation of Polish universities, both as the organizers of educational processes and as the providers of educational products. Good educational products cannot be created without scientific research. The concept of egalitarianism applied to financing research in Poland is a waste of money, because of its excessive dispersion. The brand of a university has the same value as the brand of any other service provider or producer. Small universities located in economically and culturally insignificant regions are important only for these regions, while the leading Polish universities play an important role for the whole country. Only the latter ones will secure Poland's competitive position in the information society. The role of small universities will be a stimulation to education in their regions, and mediation in using the teaching materials available electronically that have been prepared by the leading universities.

Maciej
M. Sys∏o

Teaching
process plan-
ning

lmost every teaching process, especially an innovative one, can be divided into three stages, presented below in respect of information and communication technologies:

1. Planning how information and communication technologies can be applied to teaching and the individual work of learners;
3. Determining how computer hardware and software, and the Internet will be used in the educational processes;
4. Evaluating how information and communication technologies increase the efficiency of the teaching and learning processes.

The above stages should be followed by all the people involved in the educational processes, that is by learners, teachers, instructors, school administration (including headmasters), schools as institutions, and finally by institutions which are in charge of running schools.

To achieve a full success, no stage can be omitted by any of the above mentioned people. Unfortunately, at present only some stages are taken into account and moreover, not by all participants of the educational processes. For example, while training teachers, only the first stage is taken into account. Teachers are trained how to use information and communication technologies during their classes. However, such training is not followed by the second stage, that is by organizational changes to the teachers' everyday work and the functioning of the school, while those changes are necessary to deploy information and communication technologies during classes. Another example concerns equipping schools with computer hardware and software. New computer laboratories are mainly devoted to teach pupils how to operate a computer. The needs of teachers of other disciplines, who work in specialized laboratories, are, however, not taken into account. In particular, school computers are not equipped with the proper software. Yet another negative example concerns the educational package editions (class books, workbooks and manuals) — no junior high school class book, except one, refers to computers or information technology. This does not comply with the teaching directives, yet all those class books have been accredited by the ministry of education. There is no evaluation of educational advantages provided by different actions and initiatives.

Taking into account the three stages mentioned above, the following are the most important aspects of school education that serve the purpose of the information society:

1. Training teachers at universities and post graduate courses in information and communication technologies. Here certain teaching standards must be accepted which will provide a common basis both for teachers and educational institutions. These standards should also be respected by employers. There are currently many teachers just starting their work, who are not properly trained in information technologies. Almost all universities offer post-graduate courses which however, are not tailored to the needs of individual groups of teachers. These courses focus mainly on the first stage mentioned above.
2. New teaching methods require thorough changes in the way schools operate and the manner classes are conducted, particularly with respect to subjects other than IT. There is an urgent need for a position of an IT coordinator at each school, who would be in charge of: elaboration of a program of information and communication technology classes, training other teachers in IT, helping other teachers in conducting classes which incorporate IT, and maintaining hardware and software.
3. Continuous education should not be treated as a separate stage of education following school education. Preparation for life-long learning should be incorporated in school programs, as well as vocational and individual education.
4. Computer educational environments, which in its simplest form are multimedia packages, are today one of the main partners of a learner. They will play an increasing role in almost all aspects of education. Current multimedia packages meet the real needs of learners and educational processes to a small extend only. Their authors often focus on technical aspects that are easy to fulfill, while they forgot about pedagogical aspects that are hard. Therefore,

If Poland does not take the necessary steps to adjust the universities to the demands of the global information society, then ambitious young people will look for education at foreign universities. We are probably close to the time when Bill Gates' prediction that people all over the world will be able to follow lectures conducted by the best teachers[2] becomes a reality. Unfortunately, a risk arises that a majority of students who study abroad will remain in the country where they studied. It may happen even if students study through the net, physically staying in Poland, because their education will be certified abroad.

A number of foreign universities promote their teaching products all over the world. It is worth noting the American Open Knowledge Initiative. Also Andrew W. Mellon's Fund finances the work on the open source applications and the university teaching content that will be commonly accessible through the Internet. There are many examples showing that a number of developing countries are particularly interested in the above work. Maybe those countries indeed have a chance to escape a period of industrialization.

A new player on the global university education market are highly specialized, rich, corporate universities operating world wide. Polish universities cannot compete with them without significant financial aid from the state.

A growing awareness of the importance of the continuous education will probably lead to a rapid growth of the number of students whose motivations are very pragmatic. This will be followed by a far-reaching diversification of teaching products to provide teaching individualization. As an example consider an intensive foreign language course tailored to the needs of an expert in a given field, who commands this language at a general level, and who has a well defined business trip target. He is well motivated to an intensive, individual language course just before his business trip. Using an analogy with the management systems, one may speak here about a *just-in-time* model of education.

Spending free time will involve learning. That is why a big market emerges of educational software devoted to meet individuals educational needs. Time spent that does not involve interaction, such as free TV channels offering shows, tele-novels, sitcoms and soap operas, will be of interest only to those people who are excluded from the society of citizens educating themselves.

Educational products will be more of commodity than a manifestation of the social role of the state. It may have a good influence on an efficiency-oriented attitude towards teaching processes. This approach is, however, still foreign to the state.

Doing is the best method of learning. It is better than speaking. Speaking in turn is better than watching. Watching is more efficient than listening, and listening more efficient than reading. The capabilities of information systems to support learners in interpreting, diagnosing, controlling, designing and planning will improve the efficiency of learning through increased interaction providing citizens educating themselves with many opportunities to act.

Information and communication technologies enable distance learning. Distance learning will bring new problems of the social communication of distant learners. Due to the growing possibilities of self-organization of studies by an individual, a distinction between the studying time and the professional activity time will not be as clear cut, as it is now. Popularization of teleworking will create even greater possibilities in this respect.

A survey of Polish web sites devoted to education reveals their shortage and confirms the fact that in most cases they are restricted to just a simple imitation of a school or a set of ready-to-use solutions or answers (no questions!) for pupils and teachers.

The situation of high culture products is slightly better. It is not due to the fact that digital resources are systematically expanded and catalogued, but due to young culture creators, especially alternative culture creators, who very actively support Internet with their designs (cf. www.humanista.pl or www.wywrota.pl).

Broad application of digital information in the economy, widespread education, and dissemination of national culture requires a special market. The following separate roles of such market are expected to emerge in the global information society:

1. Information content **creators**,
3. **Producers** of individualized teaching materials,
4. **Brokers** and integrators of teaching materials meeting the individual needs of citizens educating themselves,

2
B. Gates, The road ahead. Viking, New York.
http://www.roadhead.com

5. **Discussion partners** to be contacted while interactively using educational products;
6. **People certifying** and **accrediting** educational qualifications;
7. **People evaluating** the qualifications gained by individual citizens educating themselves.

Clear cut divisions between the separate roles are obviously difficult. Referring to classical principles of the rhetoric, we may state that the first group is responsible for *inventio* – that is the creation of the contents being a network of interrelated information units. *Dispositio* consists of the creation of individualized teaching materials, in other words, on designing the structure of the network of individual information units. *Elocutio* concerns the work of brokers and integrators composing educational products needed by the citizens educating themselves. The members of group number 4 and other users of teaching materials may also contribute to *inventio.*

In view of the above observations it seems highly improbable that the present institutional structure which constitutes the system of education and culture dissemination in Poland will be able to fulfill its role in the information society. It is improbable that this system will be able to generate a new standard of general education or become an institution certifying educational products. It is not ready to stimulate the demand for general education, either. Even if today institutions decide to order the development elaboration of new educational solutions, they will not serve the purpose of the transformation towards the information society. As a consequence, the real market of inventors of educational solutions, providers and customers will not emerge, and a common demand on educational services will not appear. This is why a general transformation of the educational system in Poland is so urgently needed.

Conclusions and recommendations

Wojciech Cellary

One of the fundamental truths, applicable to all kinds of societies, is that educated, well-informed people who understand the world around them are better off than the uneducated and the uninformed. They have better jobs, better wages, better access to culture, better health care and can provide a better future for their children. Potentially, information and communication technologies can provide common and cheap access to information in comparison to traditional technologies, thus giving the entire society a chance for a better education and more knowledge in all the crucial aspects of private and social life. This, in turn, may result in a steady development of individuals, as much as entire societies.

The major threat looming over the process of transformation towards an information society is the problem of social exclusion. It is believed that this exclusion is caused by the so-called *digital divide* that is a dissection of the society into those having an access to digital technologies and those who do not. This is a justified opinion, although the notion of "a digital divide" focuses on the technical aspect of the problem. In fact, the key issue behind social exclusion is the inability to keep pace with development. This problem concerns individuals, small communities (e.g. certain professional groups), as well as entire countries. The mechanism of exclusion is as follows: a community that fails to keep pace with development, is no longer able to understand the rules governing the contemporary world (i.e., requirements that must be faced by the community's members, especially with respect to the labor market, economic phenomena, functioning of the state – tasks and obligations of state administration, internal and foreign policies, as well as its own rights and opportunities). Because of this non-understanding, the community in question begins to isolate itself, to see itself as inferior, give up its ambitions, and live by its own rules. Such isolation is tantamount to an exclusion from the more active, developing part of the society, who run ahead at a fast pace, thus increasing the distance between the two. To make things worse, such exclusion can be passed from one generation onto another, thus depriving children of their chance for development and a higher living standard from the very start.

Obviously, the above phenomena takes place in the current Polish society too – cf. UNDP's 2000 Report devoted to the development of rural areas in Poland[1]. This report proves that the differences in living standards between rural and municipal areas are indeed large, and that the inhabitants of the former hardly ever benefit from the economic system transition that has been taking place in Poland for over 10 years now. In the information society, however, a new qualitative phenomenon will be the dynamics of potential social exclusion correlated with fast-paced development. Entire social groups (e.g. certain professions) who have been well-off for a longer period of time, may one day face the threat of exclusion resulting from new technologies, new business solutions, or new competition. This will be especially difficult for middle-aged people, who on the one hand are responsible for their families, and on the other hand have naturally less will and fewer capabilities to adapt themselves to new conditions, to learn new things, to accept profound changes (e.g. their professions) and – generally speaking – to develop themselves. Simultaneously, the role of the middle-aged people in the society will grow due to the foreseen decline of population growth in developed countries.

It would be naïve to believe that the problems of social exclusion can be solved by constraining the pace of development. Whether we like it or not, we will have to face rapid and constant scientific and technological progress. New inventions will very quickly come into practice. New products and services offered on the market accompanied by new busi-

[1]
Raport o Rozwoju Społecznym Polska 2000. Rozwój obszarów wiejskich [Human Development Report. Poland 2000. Development of rural areas]. UNDP, Warsaw, 2000 [in Polish].

ness practices will require new qualifications from employees who will be expected to improve and expand their skills all the time, and sometimes even change their profession completely. High qualifications, and as a consequence the ability to take full advantage of opportunities provided by new equipment and services, will influence the style and quality of life, both in individual and social terms. Therefore, whether the problem of social exclusion will be solved, depends on access to life-long education, that will provide people with an opportunity to keep pace with development.

There are several barriers of various kinds that need to be overcome to achieve this goal:

First, every individual should have access to computers, telephones, digital television, and other networked electronic devices, used as the basic tools for accessing information.

Second, information resources have to be available through the net; developed in a way that makes people development possible (i.e. national language, comprehensibility, validity, etc.).

Third, the costs of accessing communication infrastructure as well as the information itself must be low enough not to constitute a barrier to development. This applies primarily to people threatened by social exclusion.

The final and probably the most difficult obstacle is the need to overcome barriers in human mentality, especially their mistrust in their own development potential and reluctance towards making the necessary effort.

Overcoming the above barriers calls for a well-thought-out social policy. Although deeply interested, business will not solve these problems on its own. Business is always focusing on the well-educated, dynamic, and thus productive people. The socially excluded are not useful for business, either as employees or as consumers. However, business does not wish anybody to be socially excluded, in other words – business wishes everybody to be well-educated and dynamic, because it makes business development and expansion possible. This problem is well-illustrated by the current struggle for IT specialists on the international job market. Therefore, business will very probably support the campaign against social exclusion, but the brunt of this campaign must be taken by individuals themselves, assisted by the state acting directly, as well as through non governmental organizations.

Probably the most important challenge of the transformation towards the global information society that has to be faced by the state is the restructuring of the education system. The information society will be much more demanding of people – it **will require people to develop continuously during their whole life**, not just when they are young and to always have up-to-date knowledge, which will change rapidly.

The educational system developed in the nineteenth century to serve the needs of the industrial society, which is focused mainly on educating children and young people, will fail to prepare contemporary people to face the challenges of the information society. Instead of simple, incremental improvements of this system, it is necessary to identify new objectives and win the support of the teachers of all age groups to meet these objectives. One should recall the important role of teachers, who worked with a sense of social mission, in transforming the agrarian society into the industrial one.

The reason why the educational system is so important for the transformation towards the global information society is that the education of Poles will determine the ability of adaptation of Polish economy to the requirements of the electronic economy and the global market. Poland that has just, and yet not fully abandoned the perception of economy as being a heavy industrial one, must now face the challenge of understanding the economy in terms of intangible products and services instead of material production. Responsible authorities have to redefine the approach to the economic policy: no longer raw materials and the import of supplies, but science and culture should become their fundamental concern. **Science and culture will be the factors determining the competitiveness of the Polish economy in the future** when Poland will belong to the most developed part of the world.

It is indeed difficult to overestimate the importance of the educational system to adapt people to the new requirements of the job market. A major share of the society was recently shocked to realize that in the market-driven economy the employer's approach to the employees is not that of a good and lenient parent. The problem is that the two extreme effects of such a shock are either passivity and frustration, or entrepreneurship, inventiveness, and dynamism. A modern educational system must cultivate the latter qual-

ities. It must prepare people to find their place in the global job market available through the net, to understand people of different cultures they will cooperate with, and to be innovative: to identify opportunities and evaluate risks pertaining to new activities.

Transformation towards the global information society also requires functional changes of social institutions. In an information society, even such basic notions as "democracy" must be reconsidered, because of the new ways of social communication.

This report emphasizes an urgent need of permanent research on the inevitable transformation of the Polish society towards the global information society, because Poland aspires to be a member of it. The reason why such research has to be continuous is well evidenced by the fact that the Manhattan tragedy of September 11, 2001, which has significantly influenced the geopolitical situation of the world, had not been predicted, nor even considered in documents devoted to the global information society and electronic economy. As a result of research, a transformation strategy should be developed taking into account the current status and capabilities of Poland. It should be coupled with the continuous monitoring of the transformation advances and the situation world-wide. The results of the research should be taken into consideration in the adaptation processes aimed at the integration of Poland with the European Union, even after the accession, as well as in the development of economic development strategies, social policies, annual budgets, etc.

A detailed strategy and agenda of actions to undertake in the areas covered by this report can be worked out only as a result of inter-ministerial cooperation. Only interdisciplinary teams of researchers and experts can face the problems that are large, complex and interrelated. Attempts at developing new solutions by narrow groups, e.g. organized within a single ministry, are almost always reduced to improving the current system, instead of providing truly new approaches.

Conscious investigation, monitoring and management of transformation processes, which are inherently very complex and affect almost all aspects of life, requires a suitable organization structure. It is not the role of this report to define the shape of such a structure, but it seems reasonable to expect an institution that could influence – at least in an advisory capacity – all ministries and parliamentary commissions, as well as local governments. The primary task of such an institution should be the preparation of a coherent, coordinated and harmonized state policy of transformation (compare Section 2.3 *Social and Economic Development Factors* and box *Strategic Pact in Poland*). This overall, harmonized strategy would include detailed policies on education, economy, labor, society, culture, science, administration, etc. that have been sketched out in the successive chapters of this report. Such a strategy will need legal changes – this is why the coordinating institution needs to stay in touch with parliamentary commissions. Implementation of the strategy will need financing – this is why the coordinating institution needs to stay in touch with executive authorities: ministers, province governors and local governments. Moreover, such a strategy has to be coordinated on an international level, especially with the policies of the European Commission and WTO. It should benefit from the resources of UN, UNDP, UNESCO, UNIDO, the World Bank, OECD, and others.

In order not to repeat the detailed recommendations included in almost all sections of this report, let us recall just the main directions of such a harmonized strategy.

It is necessary to develop **a new economic policy** aimed at adapting the Polish economy to the needs of a knowledge-based, electronic economy, and make it a part of the global market.

A new approach is necessary to information technology, telecommunications, and media (both electronic and traditional), because of their convergence and their importance for development.

A new labor policy is required that takes into consideration new forms of work, including teleworking, and the new organization of work.

A new scientific policy is needed. Science and research should contribute to the transformation of the Polish society towards the global information society. To achieve this goal, science and research should be closely related with the Polish economy.

A new cultural policy should aim at providing the global market with digitized Polish culture products on the one hand, and ensuring Polish culture durability and development in the Polish society, on the other.

Conclusions and recommendations

Public administration at all levels needs to rise to the challenge of the global information society and not become a braking force in social and economic development.

Far-fetched changes to the law are required enabling it to adapt to the challenges and threats of the global information society and the electronic economy. There is also a need for prior research, including international research, on new legal solutions.

Profound changes are required in the education policy. Let us stress again that this policy is of utmost importance for the success of the transformation towards the global information society. It would be really bad, if the Ministry of Education, preoccupied with the current reform of primary and secondary schools, fails to notice its own responsibility for preparing people to the challenges of the global information society. An important role is to be played by the Ministry of Labor and Social Affairs that should define the requirements for the educational system, since the ministry's efficiency in fighting unemployment largely depends on the quality of education of the working population. The education policy has to comprise a multi-faceted system of life-long education, so as to give adults an opportunity to stay educated and competent, thus being competitive in the volatile labor market.

This report also points out a need for public debate on the transformation towards the global information society. Such a debate should not be a one-off event – it should be a continuous process. The forthcoming challenges must not surprise the Polish society, which should be given an opportunity to prepare itself for the changes and to make conscious choices between the directions of development according to democratic rules. It is impossible to overestimate the role the media can play in preparing and carrying out such a public debate.

This report also implies the need to develop new research methods that would allow for the description of developmental processes observed during the transformation towards the global information society. Recognizing the overall value of the HDI index, it would be useful to find new indexes that could characterize such phenomena as for example social exclusion caused by the digital divide. Comparing the values of such an index calculated for different countries and analyzing the policies enforced there, one could draw conclusions regarding the efficiency of such policies. On the other hand, calculating such an index for one country over several years, one could infer whether the long-term policies against social exclusion had been effective or not.

Similarly, it would be useful to develop a collective index characterizing the influence of globalization on a given society. In other words, such an index should show whether and to what extent a given country takes advantage of globalization and uses it for expanding its culture. Or, if a given country fails to take advantage of globalization, to what extent globalization eliminates the local culture of such a country.

9.1   Lucyna Nowak

The Human Development Index (HDI) calculation methodology

Human Development Index (HDI) was introduced for the purpose of drawing comparisons between different countries. It is a synthetic measure developed on the base of a uniform methodology recommended by the UNDP. It describes the results of human development achieved in different countries. More precisely, HDI describes the level of human development of a given country in comparison to others. It is used to rank countries with respect to their general development level at a given time. By comparing the value of the index between different countries, it is possible to determine the gap in human development between the poorest and the richest countries, or between the developing and the developed ones.

Human Development Index is calculated on the base of the components characterizing the following areas: [UNDP, HDR 2000]:

1. Income sharing.
2. Life span extension.
3. Level of educational achievements.

According to the methodology recommended by the UNDP, when calculating synthetic HDI the following four measures are used:

- life expectancy at birth;
- combined first-, second- and third level gross enrolment ratio — first used for HDI calculation in 1992, it replaced the average adults over 25 years of age enrolment in schools;
- literacy index, which is combined with the above index into one measure characterizing the level of educational achievements of a given society;
- Gross Domestic Product per capita in USD calculated based on the Purchasing Power Parity (PPP USD).

The calculation procedure was first presented in the 1990 Human Development Report, and later in compliance to the changed methodology subsequently in the 1995 Human Development Report and 1999 HDR[1].

The HDI formula for a given country at a given time is the following:

$$H_j = \frac{1}{3} \sum_i^3 H_{ij}$$

$$H_{ij} = \frac{X_{ij} - \min_k \{X_{ik}\}}{\max_k \{X_{ik}\} - \min_k \{X_{ik}\}}$$

where: j — denotes a country,

      i = 1, 2, 3, denotes the current number of a variable used for calculating HDI,

      k — variable maximum or minimum values.

1
Human Development Report:
1990, 1995, 1999.
UNDP, Oxford University Press,
Oxford.

Considerable changes with respect to the HDI calculation methodology have resulted mainly from the modification of the indices used for evaluation of the dispersion of the given variables. In general, the method of dispersion evaluation based on the extreme values of a given index observed at a given time in a group of countries included in the ranking, was abandoned. Since 1992 the values of individual indices in a given period are taken into account instead of the extreme values (currently from the years 1960 - 2020).

The following extreme values are assumed:
- life expectancy at birth — average 25–85 years, 22.5–82.5 years for men, and 27.5–87.5 years for women;
- general enrolment index regardless of sex — 0%–100%;
- literacy index, also regardless of sex 0%–100%;
- Gross Domestic Product per capita according to the Purchasing Power Parity (PPP USD) per capita: USD 100–USD 40 000.

To standardize the national income until 1998, i.e. with respect to the data for 1996 and the previous years, an average income was assumed. For 1996, an average Gross Domestic Product per capita in the world in 1995, equal to USD 5 990, was assumed, as well as an adjusted maximum income of PPP USD 6 311.

Also until 1998, when calculating the GNP per capita diversification index, a logarithmic function was used to adjusted income above USD 5 990 (y^*), being the average world income in 1996. This approach followed mostly from the calculation technique. The Atkinson's formula which was used is as follows:

$$W(y) = y^* \text{ for } 0 < y < y^*$$
$$W(y) = y^* + 2[(y - y^*)^{1/2}] \text{ for } y^* < y < 2y^*$$
$$W(y) = y^* + 2(y^*)^{1/2} + 3(y - 2y^*)^{1/3}] \text{ for } 2y^* < y < 3y^*$$
$$W(y) = y^* + 2(y^*)^{1/2} + 3(y - 2y^*)^{1/3}] + n\{[1 - (n - 1)y^*]\}^{1/n} \text{ for } (n - 1)y^* < y < ny^*$$

The general formula for a maximum income per capita equal to PPP USD 40 000 is as follows:

$$W(y) = y^* + 2(y^*)^{1/2} + 3(y^*)^{1/3} + 4(y^*)^{1/4} + 5(y^*)^{1/5} + 6(y^*)^{1/6} + 7[(40\ 000 - 6y^*)^{1/7}]$$

In 1999 the income standardization formula was changed. The following logarithmic formula was used:

$$W(y) = \frac{\log(y) - \log(y_{min})}{\log(y_{max}) - \log(y_{min})}$$

This change enables to maintain a greater dispersion for the countries which showed a very high level of GDP per capita. Standardization of the value of the income logarithmic function concerns all income levels, not only income exceeding the average world income. Applying the logarithmic procedure to all GDP per capita levels for individual countries, lowers the values of the HDI. Currently, the HDI for 1999 did not exceed the value of 0.939 , whereas in 1996 it topped 0.960 (according to the previous method).

However, the same criteria has been maintained to distinguish industrialized countries from the poorly developed ones. The value of the HDI ranges from of 0 — 1:
- 0–0.5 — a poorly developed country,
- 0.501–0.8 — a middle-developed country,
- 0.801–1.0 — a highly developed country.

The HDI may indicate a level of human development of a given country in relation to other countries, both at a given time as well as over a longer time span.

9.2   Lucyna Nowak
The Human Development Index (HDI)
for Poland for the years 1995-1999

Polish experience in evaluating the Human Development Index (HDI)

Evaluation of basic indices used for the calculation of the Human Development Index (HDI), their applicability as well as the accessibility of information used for their calculation were considered in the first Human Development Report for Poland in 1995, which included the data for 1992[2]. This report presented — for the first time — the HDI indices in a provincial context. A new methodology for calculating the HDI was used in the report in 1996, where data for 1993 were presented[3]. It was the first time that a combined first-, second- and third level gross enrolment ratio was used in calculating the HDI. It allowed for the observation of the "flow" of students through different levels of education instead of the number of people at fixed level of education. Enrolment ratios are better statistical measures than the average adult duration of education (used in calculations until 1992), which was stressed in previous Polish reports.

A regional approach to human development was again presented in the 1997 national report[4]. The report featured data for 1995, which presented educational achievements and the level of national income in a provincial context. Due to a restricted number of information sources, part of the data was an approximation. Out of necessity, a number of assumptions were made to perform basic calculations including the GDP measured in Purchasing Power Parity USD, as well as combined first-, second and third- level gross enrolment ratios — of course for the separate provinces as of 1995 (before the territorial reform).

Subsequent modifications to the methodology in the national report — including mainly the extension of the presentation of the scope of synthetic measures — were introduced in 1999. These modifications incorporated a new synthetic Human Poverty Index (HPI). The results of the calculations were presented in the 1999 report which referred to the data for 1996 and the previous years[5].

One should remember that the level of human development determines the economic development not only at the time when it occurrs but also in the following years. One can say that human development should not only be measured by the quantitative economic development but also by a relatively full participation of the society in the development process. The richer the country, the more money it can spend on financing social affaires, developing social infrastructure and such investments, whose effects will be observed after a period of time. Similarly, the level of human development in a given year is a result of proper investments in human resources in the previous years.

The current National Human Development Report is devoted to the impact of new information and communication technologies on social development. Deployment of such technologies and their applications contribute to the development of the information society. It is very difficult to distinguish such indices which show when the transition from the industrial society to the information society occurs. (By an information society we mean here the one, where information is the most important factor of development). There are many challenges that statisticians have to face, first of all, they have to work out definitions of new indices and new survey methods[6].

The current report contains the general HDI for 1998 calculated according to the new methodology with respect to the whole country. The general HDI for 1999 was also approximately calculated by extrapolating GDP per capita at PPP USD 8 500.

Polish reports on human development include an annex with tables presenting various human and economic indices, both on a micro and macro economic level. The scope of presented indices for Poland corresponds to the scope of similar global reports. However, all information presented in the Polish reports comes from Polish public statistics surveys.

2
Human Development Report Poland '95.

3
Human Development Report Poland '96.

4
L. Nowak, Zmiany wskaźnika (indeksu) rozwoju społecznego oraz wskaźników podstawowych [Fluctuations on the human development index and basic indices]. In: National Report on Human Development. The changing role of the state. Poland '97. UNDP, Warsaw 1997 [in Polish].

5
Human Development Report Poland '99. Towards the dignified active old age. UNDP, Warsaw 1999

6
T. Walczak, Społeczeństwo informacyjne a zadania statystyki [The Information Society and the role of statistic]. Wiadomości Statystyczne 6, GUS and PTS, Warsaw 2001 [in Polish].

We decided not to quote foreign sources — with a few exceptions, where referring to foreign statistics was necessary. In some areas of the Polish public statistics there are still information gaps, which are mainly a result of the process of adaptation of Polish statistics to the international requirements.

The HDI for Poland for the years 1998–1999

To calculate the synthetic HDI for Poland the following measures were used:
- life expectancy at birth,
- combined first-, second- and third level gross enrolment ratio,
- literacy rate,
- Gross Domestic Product (according to the Purchasing Power Parity in USD), per capita.

The first basic index being life expectancy at birth is a parameter of yearly life expectancy tables for people according to sex, age, urban or rural place of residence. Average life expectancy in Poland in 1999 was equal to 68.8 years for men and 77.5 for women, which gives an average of 73.0 for both sexes. It is still growing[7]. Life expectancy parameters are commonly applied in Poland as a measure used for assessing demographic development and for evaluating the health condition of the society.

Educational achievements of Polish society can be evaluated based on current surveys concerning the enrolment of children and youth in education, surveys conducted in households, and estimates. For the calculations presented in the annex both the data taken from current surveys of the Central Statistics Office (GUS) on education[8], and demographic data were used. In 1999, a combined first-, second- and third level gross enrolment ratio was equal to 78.5%, 81.1% for women and 76.0% for men. In the 1990s the value of the ratio was growing each year due to an increasing interest by young people in continuing their education, both at high school and university. The literacy index has remained fixed for years at a level of 99%, being slightly higher for men — 99.5% as compared to 98.5% for women.

Another issue is calculating the GDP according to Purchasing Power Parity in USD per capita. The GDP according to PPP in USD is evaluated for the whole country, for each year starting from 1990. In 1998, the GDP was equal to PPP USD 8,167 per capita. Collecting data concerning the GDP with respect to separate provinces is a more difficult task.

Poland possesses valid and up-to-date statistical data that can be directly or after recalculation used for calculating the HDI for each year — but only at a national level. In most cases it is necessary to estimate the data for the HDI with respect to a given province or selected rural or urban areas.

The HDI for Poland in 1998 was equal to 0.818 and in 1999 — to 0.821 (according to the new calculation methodology), which means that Poland still belongs to a group of highly developed countries when social and economic growth considered. Let us remember that the countries with an HDI higher than 0.8 belong to this group. It is important to note that the value of the index is growing, for example, it was equal to 0.796 in 1995 and 0.801 in 1996.

Basic indices used for calculating the HDI on the national level and the results of these calculations for the years 1995-1998 are presented in Table 9.1.

The HDI plays two main roles. On the one hand, it enables one to evaluate how far Poland is from the level of full human development. The full human development state is characterized by: an average life expectancy equal to 85 (for both sexes) —currently 73 in Poland; the index of educational achievements equal to 100% — currently a combined first, second and third- level gross enrolment ratio equals 78.5%, while literacy ratio — 99%; the maximum level of global GDP per capita equal to 40 000 USD — in 1998 an analogous national income value in Poland was equal to 8 167 PPP USD. The distance between 0.821 and 1.0 shows how far Poland is from reaching the full human development state. The HDI has been calculated for Poland since 1992 and has been presented in the national reports (cf. annex).

7
Trwanie życia w 1999 r.
[Life duration in 1999].
GUS, Warsaw 1999 [in Polish].

8
Oświata i wychowanie w roku
szkolnym 1999/2000
[Education and upbringing
in the school year
of 1999/2000].
GUS, Warsaw 2000 [in Polish].

Specification	1995	1996	1997	1995	1996	1997	1998	1999
	Previous metod			New calculation method				
Basic measures used for calculating HDI								
1. Life expectancy at birth (in years)	72.1	72.5	72.8	72.1	72.5	72.8	73.0	73.0
2. Literacy index (%)	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
3. General enrolment index (%)	74.7	75.2	76.5	74.7	75.2	76.5	77.6	78.5
4. GDP per capita (PPP in USD)	6 350	6 663	7 320	6 350	6 663	7 320	8 167	8 500*
Partial indices								
1. Life expectancy index	0.785	0.792	0.797	0.785	0.792	0.797	0.800	0.802
2. Literacy rate	0.99	0,99	0.99	0.99	0.99	0.99	0.99	0.99
3. General enrolment index	0.747	0.752	0.765	0.747	0.752	0.765	0.776	0.785
4. Educational achievements index	0.909	0.911	0.915	0.909	0.911	0.915	0.919	0.922
5. GDP index (acc. to the new method)	0.955	0.957	0.960	0.693	0.701	0.717	0.735	0.741
General HDI	0.883	0.886	0.891	0.796	0.801	0.809	0.818	0.821

Table 9.1.
Human Development Index (HDI)
for Poland for the years
1995-1999

Source: Author's calculation (L. Nowak) on the basis of the methodology presented in Human Development Report 2000. UNDP, Oxford University Press 2000, New York Oxford the data published by GUS.

* Note: Estimated HDI has been presented in italics provided that, GDP in 1999 according to PPP in USD per capita, equaled USD 8 500.

The analysis of the Human Development Index (HDI) changes

In the 1990s, Poland moved down in the global ranking of 174 countries — according to the HDI — from 49th position in 1992 to 58th position in 1994 (after the calculation method modification). This was the lowest place to be held by Poland in the global country ranking according to the human development level. In the next years Poland continuously moved up (see Table 1 of the annex). In 1998 Poland was 44th among the 46 most developed countries in the world. In 1999 it moved up to 38th position in the ranking of 162 countries worldwide (12 countries were excepted as their indices were not reliable).

The distance between twenty of the most developed countries and Poland is relatively high (approx. 0.15 HDI). In 1999, similar to the previous years, twenty most developed countries included: nearly all countries of the European Union (except Greece, Portugal and Spain) and above that: Norway, Switzerland and Iceland, as well as 5 non-European countries, where 4 of them — Australia, Canada, the USA and Japan belonged to the first 10 most developed countries, with New Zealand outside the first 10. Within European countries the highest positions in the 1999 ranking were held by: Norway, Sweden, Belgium, Iceland and Holland.

Country rankings according to the HDI are published yearly in the global human development report developed on the base of international estimations. This is why the indices presented there are different from the indices calculated on the base of Polish statistical data. For example, according to the UNDP experts the value of the HDI for Poland in 1998 was equal to 0.818 (according to the new calculation methodology) and 0.795 in 1995.

If human development in 1999 in other countries remained unchanged in comparison to 1998, then Poland might move up in the global ranking of countries from 44th to 38th position. Such forecasts are based on the estimated HDI for Poland in 1999 that equals 0.821.

Interesting conclusions may be drawn when comparing two country rankings — that of the HDI, and that of the Gross Domestic Product (GDP) per capita. In the second ranking Poland's position is 10 positions lower in 1998 — Poland holds 54th position in the ranking of 174 countries, and 11 positions lower in 1999 — Poland holds 47th position in the ranking of 162 countries. This means that the national income per capita in Poland is much lower when compared to other highly developed countries, despite the fact that in the first half of 1990s Poland went through a period of a dynamic economic growth. Within the twenty most developed countries only Norway showed a higher GDP increase (in fixed prices) per capita than Poland in the first years of 1990s. This results from a high human development level already recorded by Poland in the previous years, due to increased acces to national health care and a high level of access to education. An abrupt slump of the

economic development and the decrease of the GDP slowed down human development, particularly in the areas that are affected by the GDP.

Among the countries which went through the period of social and economic transformation, the highest ranking is held by Slovenia (29th position), then the Czech Republic (33–34) and Slovakia (35–40). The remaining economic transformation countries hold noticeably lower positions: Hungary (36–43 place), Estonia (44–46), Lithuania (47–52), Russia (55–62) and Latvia (47–52). The changes with respect to ranking positions held by the above countries indicate an ongoing process of regional development diversification. The majority of economic and social transformation countries are far behind other European countries. The average Human Development Index for highly developed countries equals 0.914 and is almost 0.1 higher than the HDI for Poland. Also the OECD countries show a higher level of human development.

Analyzing the positions held by different countries within the ranking it is important to mention the countries where a high level of human development achieved is mainly a result of the level of education and health care. These include Scandinavian countries which ranked the highest.

The estimated Human Development Index based on the data with respect to men and women was equal to 0.88 in 1999, which indicated an imbalance in human development of the main social groups: women and men, although the index showed some growth trend. A similar imbalance also concerns other social groups, like the rich and the poor (living on or under subsistence level), the employed and the unemployed, the urban and rural areas dwellers, etc.

The level of human development is most balanced in Norway, Belgium, Switzerland and Holland (in Europe) and in Canada, the USA and Japan (outside Europe).

9.3
The Human Poverty Index (HPI) calculation methodology

The human poverty index is a synthetic measure representing the level of social poverty in relation to the populations development rate. This measure is an illustration of the degree of "pauperization" in such areas of social activity as health, life expectancy, level of educational achievements of the society as well as income share and standard of living.

The HPI formula, initially uniform for all countries, was presented for the first time in the 1997 global Human Development Report and later — in a modified version — separately for the developing countries (HPI-1) and the industrialized countries (HPI-2) in the 1998 Human Development Report.

According to the HPI calculation methodology recommended by the UNDP (for individual countries) the following measures should be applied:

1. In health conditions and life expectancy:
   - percentage of the people dying under the age of 60 (P_1)
2. In education achievements:
   - percentage of illiterate persons (understood as functional illiteracy — defined by the OECD as the lack of ability to read and communicate) — P_2
3. In living standards deprivation and marginalization:
   - percentage of the people living on income under the poverty line, set at the level of 50% of the median of individual income at one's disposal (P_3)
4. In deprivation of inclusion/exclusion from social development:
   - long-term unemployment rate (12 months or more) as the percentage of the unemployed of the total of labor force resources (P_4)

The HPI for a particular country at a specific time t has the following form:

$$HPI = [1/4 \, (P_1^3 + P_2^3 + P_3^3 + P_4^3)]^{1/3}$$

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The HPI values range from 0 and 100. The higher the index value, the greater the degree of pauperization of the population.

9.4

The Human Poverty Index for Poland for the years 1995-1999

The results of the HPI calculation for Poland were published for the first time in the 1999 national report. The HDR global reports for the years 1996 - 1997 do not mention the HPI value for Poland, mainly due to the lack of proper data. The methodology recommended by the UNDP experts was slightly modified out of necessity, which enabled a proper calculation for Poland. The modification involved replacing the recommended P_3 component with the percentage of the people living under the relative poverty line, set at a level of 50% of average monthly household expenditures (including food costs), in concordance with the OECD equivalence scale[9] — cf. Table 9.2.

The HPI for Poland in the years 1995–1999 did not vary much: from 27.8 in 1995 to 27.9 in 1999. The methodological modification described above enables comparing the HPI value for Poland with the indices for other countries. Nonetheless, one should bear in mind that the modification resulted in "overrating" the P_3 component and as a consequence the synthetic HPI for Poland.

Table 9.2.
HPI for Poland
in the years 1995-1999

Specification	1995	1997	1998	1999
Percentage of the people dying under the age of 60 (P_1)	18.6	17.6	17.1	17.1
Percentage of illiterate people (understood as functional illiteracy defined by the OECD as the lack of ability to read and communicate) — P_2	42.6	42.6	42.6	42.6
Percentage of the people living under the relative poverty line, defined as 50% of the average monthly household expenditures (P_3)	12.8	15.3	15.8	16.5
Long-term unemployment rate (over 12 months) as the percentage of unemployed people out of the total labor force (P_4)	5.3	3.5	3.8	4.8
HPI	27.81	27.85	27.84	27.90

Source: Author's calculations (L. Nowak) based upon the methodology recommended by the UNDP experts [UNDP, Human Development…, 2000] with the application of data published by Central Statistics Office (GUS 2000 and 2001).

The HPI value for Poland is two and even three times higher than for European countries among the top 20 countries in the UNDP ranking.

The lowest HPI in the years 1995 - 1998 was achieved in Sweden (6.8-7.6%), Norway (7.3%) and the Netherlands (8.2%). An HPI of almost twice these levels was observed in 1998 in Ireland and Great Britain (15.0% and 14% respectively), and among non-European countries — USA (15.8%).

One should also mention a noticeable stabilization of the HPI in Poland between 1995 and 1999 despite some major changes with respect to individual components. The situation in the job market has undoubtedly worsened over the past few years furthering the living standard deprivation. However, these disadvantageous changes have been counterbalanced by the improvement in the health condition of the population.

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Sfera ubóstwa w Polsce
(w świetle badań gospodarstw
domowych 1997)
[State of poverty in Poland
(based on the research on
households 1997)]. GUS, Warsaw
1998; Warunki życia ludności
w 1999 r. [Life conditions of
the population in 1999].GUS,
Warsaw 2000 [in Polish].

10
Education at a glance.
OECD Indicators,
Paris 1998.

The results of the calculations for some indices require some comment, especially due to the fact that the degree of deprivation in particular areas of social life varies.

Also the functional illiteracy index for the Polish population between the age of 16 and 65 (42.6%) is very disadvantageous in comparison to other economically developed countries. This index is a result of a special study on functional illiteracy (International Adult Literacy Survey — IALS) carried out in Poland between 1994 and 1995 in compliance with the methodology recommended by the OECD[10]. The study was carried out according to the same standards used in several European countries.

9.5 Lucyna Nowak

GDI and GEM social diversification indices for Poland for the years 1998-1999

In compliance with the calculation methodology recommended by the authors of the global Human Development Reports [HDR 1998, 1999 and 2000], two indices were recommended for assessing women's participation in social development: the Gender-related Development Index — GDI, and the Gender Empowerment Measure — GEM. The first of the two is based on the same calculation method as the general HDI, which means that it is a combination of indexes calculated for men and women, while keeping the right proportion between the genders. On the other hand, the GEM index describes women's chances for active participation in public social life (politics, economic development, professional activity) and the share of the two groups in decision making processes.

Gender is one of the aspects that significantly influence the value of the human development index in all countries. The greatest advantage of using the gender criterion is its universality. Most social indices are calculated separately for men and women.

In Poland, just like in other countries, there is no difficulty in collecting data on life expectancy or education of both men and women. Women in Poland live on average 8,5 years longer than men. This is a major difference when compared to Western Europe and Scandinavian countries, still it is much smaller than in many of the Central and Eastern Europe countries. During the period of social and economic transition in Poland the life expectancy increased by 2 years for women and by 2.7 years for men. It is a very substantial growth, all the more remarkable in that Poland was one of a few countries in the region where this positive trend occurred.

The level of enrolment in education in Poland is much higher for women than for men. In 1998 and in 1999 a combined first-, second- and third- level gross enrolment ratio for women between 6-24 years of age was: 79.8% and 81.1%, respectively and it was almost 5% higher than the value for men. In recent years this difference has increased significantly in favor of women. This means that women take part in the educational process more frequently. This growth is most noticeable at the level of post-secondary and university education. In comparison to other European countries, in particular those which were ranked at the top of the list as highly developed countries, education of Polish women still does not equal the level of education in Scandinavian or Western European countries.

It is much more difficult to assess the share of Polish women in generating the national product, or like in our case, the Gross Domestic Product according to Purchasing Power Parity (PPP USD). In order to make a correct evaluation, one has to apply different economic categories on a micro and macro economic scale, depending on the information that is available in a given country at a given time. The categories which are most frequently used for the purpose of international comparisons are: earnings of men and women employed outside agriculture and the share of men and women in the job market.

The results of Polish statistical surveys and estimates for 1998–1999 indicate that the ratio of women's gross earnings outside agriculture to men's earnings in public and private sectors was equal to 80% and has increased by 5% since the beginning of 1990s. Also the

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share of women's gross earnings in gross total earnings has increased to approximately 91%. At the same time, the share of women in the job market, or more specifically, in the number of economically active people amounted to 45.9% in 1999, and has practically not changed in comparison to the previous years. The estimated share in total occupational earnings for the years 1998 and 1999, and at the same time, their share in generating the GDP is approximately 40.6% for women and 59.4% for men, respectively (see Table 9.3). In the 1990s women's share in the generation of Poland's GDP was on the increase, although this process was fairly slow. For comparison, it amounted to less than 40% at the beginning of the transformation period in Poland.

Throughout the 1990s the participation of Polish women in political and professional life remained relatively unchanged. In 1999 the percentage of women in the Polish parliament (approximately 13%) which was lower than in the European Union countries, e.g. the Netherlands — 32% or Spain — 40%. The number of women in parliaments is highest in the Scandinavian countries.

Comparing the GDI and GEM indices for Poland with those of other countries a very positive trend can be noticed — in 1999 Poland moved a few positions up in the ranking of the highly developed countries. As far as GDI index was concerned, Poland was in 36th position, after the Czech Republic, Slovakia and Hungary. As far as GEM index was concerned, Poland was 32nd, after the Czech Republic and Slovakia, but before Hungary. The available data from other countries suggests that the situation in Poland is improving as compared to many European countries. To a large extent, it is a result of the high level of education and professional position of Polish women.

Table 9.3.
Data for calculating GDI and GEM for 1998-1999

Specification	1998			1999		
	Total	Men	Women	Total	Men	Women
Basic values for calculating GDI						
Average life expectancy (years)		68.9	77.3		68.8	77.5
Literacy index (%)		99.5	98.5		99.5	98.5
Combined first-, second- and third- level gross enrolment ratio (%)		75.5	79.8		76.0	81.1
Occupational earnings share (%)		59.4	40.6		59.4	40.6
Partial Indexes						
Life expectancy		0.773	0.831		0.772	0.833
Literacy		0.995	0.985		0.995	0.985
Education enrolment ratio		0.755	0.798		0.760	0.811
Educational achievements		0.915	0.923		0.917	0.927
Basic values for calculating GEM	0.879			0.880		
Share in the total number of seats in the Polish Parliament (%)		87.0	13.0		87.0	13.0
Administrators and managers (%)		64.6	35.4		64.6	35.4
Professional and technical workers (%)		38.1	61.9		38.1	61.9
Share of population (%)		48.6	51.4		48.6	51.4
Share in GDP generation (%)		59.4	40.6		59.4	40.6
Index of parliamentary representation	0.443			0.443		
Index of position in administration and management	0.929			0.929		
Index of "balanced" share in GDP generation	0.193			0.200		
GEM index describing women's						

participation in public life and decision		
making processes	0.522	0.524

Source: Author's calculation (L. Nowak) on the basis of the methodology presented in Human Development Report 2000. UNDP, Oxford University Press 2000, Oxford, and the data published by GUS.

Similarly positive trend can be observed in other Central European countries and the former Soviet Union (comparison of the GDI indices). However, in most European countries, in particular in Scandinavia the differences in social status of men and women are much smaller than in Poland. The following criteria were considered here: life expectancy, educational achievements, as well as men's and women's share in public life.

Introducing gender as an additional criterion of human development differentiation is very relevant for Poland, due to substantially different basic index levels of social development in different countries, the 'adjusted' HDI indicates unequal social development of various social groups, in this case, men and women.

9.6 Lucyna Nowak

Statistics

1
Human development index
HDI

A	B	C	D	E	F	G	H	I	J	K
1992	71.2	99.0	73.1	4 137	4 137	0.770	0.873	0.759	0.801	49
1993	71.8	99.0	73.5	5 114	5 114	0.780	0.905	0.940	0.875[b]	56
1994	71.9	99.0	74.1	5 459	5 459	0.782	0.907	0.902	0.864	58
1995	72.1	99.0	74.7	6 350	5 880	0.785	0.909	0.955	0.883	52
1996	72.5	99.0	75.2	6 663	6 042	0.792	0.911	0.957	0.886	.
1997	72.8	99.0	76.5	7 320	X	0.797	0.915	0.717[d]	0.809[d]	44[d]
1998	73.0	99.0	77.6	8 167	X	0.800	0.919	0.735[d]	0.818[d]	44
1999	73.0	99.0	78.5	8 500[c]	X	0.802	0.922	0.741[d]	0.821[e]	38

A) Years, B) Life expectancy at birth (in years), C) Adult literacy rate (%), D) Combined first-, second- and third- level gross enrolment ratio[a] (%), E) Real GDP per capita (PPP$ US), F) Adjusted real GDP per capita (PPP$ US), G) Life expectancy index, H) Educational attainment index, I) GDP Adjusted index, J) Human develop-ment index value (HDI), K) HDI rank for Poland for specific years[c]

a) on primary and secondary level without schools for adults; calculated for children and teenagers at age 6–24,
b) since 1993 the change of calculation method HDI,
c) according to the global report Human Development Report 2000 (UNDP). Oxford University Press, New

2
Gender-related development index
GDI

A	B	C	D	E	F	G	H	I	J	K
1993	76.0	67.4	98.5	99.5	74.3	72.7	39.6	60.4	0.825	37
1994	76.1	67.5	98.5	99.5	75.3	73.0	40.0	60.0	0.845	37
1995	76.4	67.6	98.5	99.5	76.3	73.1	40.2	59.8	0.866	35
1996	76.6	68.1	98.5	99.5	77.1	73.4	40.2	59.8	0.870	44
1997	77.0	68.5	98.5	99.5	78.6	74.5	40.0	60.0	0.874	40
1998	77.3	68.9	98.5	99.5	79.8	75.5	40.6	59.4	0.879	40
1999	77.5	68.8	98.5	99.5	81.1	76.0	40.6	59.4	0.880	36

A) Years, B) Life expectancy at birth (years) — female, C) Life expectancy at birth (years) — male, D) Adult literacy rate (%) — female, E) Adult literacy rate (%) — male, F) Combined primary, secondary and tertiary gross enrolment ratio (%) — female, G) Combined primary, secondary and tertiary gross enrolment ratio (%) — male, H) Earned income share (%) — female, I) Earned income share (%) — male, J) GDI value, K) GDI rank for Poland for specific years[a]

A	B	C	D	E	F	G
1993	9.0	38.2	56.5	39.6	0.466	41
1994	13.0	34.3	62.4	40.0	0.497	42
1995	13.0	34.5	63.2	40.2	0.503	29
1996	13.0	35.4	61.9	40.2	0.510	

A) Years, B) Seats held in parliament (% women), C) Administrators and managers (% women), D) Professional and technical workers (% women), E) Earned income share (% women), F) GEM value, G) GEM rank for Poland for specific years[a]

A	B	C	D	E	F	G	H	I	J	K	L
1992	71.2	10	429	1.6	73.1	15	16	16	30	4 697	.
1993	71.8	12	423	1.6	73.5	18	19	17	30	5 114	.
1994	71.9	11	414	1.6	74.1	20	22	14	31	5 459	.
1995	72.1	10	404	1.7	74.7	22	25	13	32	6 350	3 221
1996	72.5	10	400	1.7	75.2	25	29	11	32	6 663	3 457
1997	72.8	10	399	2.1	76.5	29	34	11	38	7 320	3

A) Years, B) Life expectancy at birth (in years), C) Maternal mortality rate (per 100 000 live births), D) Population per doctor, E) R & D scientists and technicians (per 1 000 people), F) Combined first-, second- and third-level gross enrolment ratio[a] at age 6-24 — (%), G) Tertiary full-time equivalent gross enrolment ratio — total, H) Tertiary full-time equivalent gross enrolment ratio — female, I) Daily newspapers (copies per 100 people), J) Televisions (per 100 people), K) Real GDP per capita (PPP$ US), L) GNP per capita (US$)

A	B	C	D	E	F	G	H	I
1992	13.7	27.2	31.1	59.2	.	142.4	243.6	177
1993	14.9	29.4	34.2	58.3	4.0	134.6	327.9	169
1994	13.9	29.3	34.8	57.4	.	130.7	428.6	185
1995	13.1	28.7	33.7	56.2	.	126.8	543.5	200

A) Years, B) Unemployment rate[a] (%), C) Youth unemployment rate (%) (at age 15-24) — male, D) Youth unemployment rate (%) (at age 15-24) — female, E) Adults with less than uppersecondary education (as % of population at age 18-59/64)[b], F) Ratio of income of highest 20% of households to lowest 20%[c], G) Average annual rate of inflation (%) — previous period = 100, H) Average annual rate of inflation (%) — 1990 = 100, I) Injuries and deaths from road accidents (per 100 000 people)

Statistical indices

6 Violence and crime

A	B	C	D	E	F	G
1992	122.5	2.6	2.6	1.9	25.3	
5.0						
1993	122.3	2.9	5.8	2.0	24.8	
5.0						
1994	121.1	3.0	4.8	2.0	24.7	
4.5						
1995	116.0	2.9	4.8	2.3	24.3	
4.7						

A) Years, B) Prisoners (per 100 000 people), C) Homicides (per 100 000 people), D) Drug crimes (per 100 000 people), E) Total number of rapes reported by adults (thous.), F) Suicides (per 100 000 people) — male, G) Suicides (per 100 000 people) — female

Source: Statistical yearbooks of Poland: 1996, 1997, 1998, 1999 and 2000. GUS, Warsaw.

7 Health profile

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1992	.	.	8.7	91	46	145	73	0.1	9.9	.	14.4	.	
5.1[d]													
1993	.	.	9.4	91	48	151	76	0.2	9.9	.	13.5	.	
4.7[d]													
1994	.	.	9.4	84	45	150	75	0.2	9.9	.	13.8	.	
4.7[d]													
1995	.	.	8.8	83	44	154	76	0.3	9.9	.	10.1	.	4.6
1996	47.3[c]	24.5[c]	7.3	81	43	149	75	0.3	14.3[c]	.	10.9	.	4.9

A) Years, B) Adults who smoke (% of people at 15 years and more) — male, C) Adults who smoke (% of people at 15 years and more) — female, D) Alcohol consumption per capita[a] (in litres), E) Likelihood of dying after age 65 of (per 10 000 people) heart diseases — male, F) Likelihood of dying after age 65 of (per 10 000 people) heart diseases — female, G) Likelihood of dying after age 65 of (per 10 000 people) malignant neoplasms — male, H) Likelihood of dying after age 65 of (per 10 000 people) malignant neoplasms — female, I) AIDS cases (per 100 000 people), J) People with disabilities (as % of total population), K) Health bills paid by public insurance (%), L) Public expenditure on health (as % of total public expenditures), M) Private expenditure on health (as% of total health expenditures), N) Total expenditures on health (as % of GDP)[b]

a) 40% vol. alcohol, b) only the public expenditures, c) results of the sample questionnaire survey of popu-

8 Urbanization

A	B	C	D	E	F	G
1980	58.7	1.8	6.8	11.6	1 596	
1.2						
1990	61.8	0.9	6.6	10.6	1 656	
0.1						
1993	61.8	0.5	6.4	10.4	1 643	–
0.1						
1994	61.8	0.3	6.4	10.3	1 641	–
0.1						
1995	61.8	0.0	6.4	10.3	1 635	–
0.4						

A) Years, B) Urban population (% of total population), C) Urban population annual growth rate (%), D) Population in cities with more than 750 000 inhabitants as % of total population, E) Population in cities with more than 750 000 inhabitants as % of urban population, F) Largest city — Warsaw — population (thous.), G) Largest city — Warsaw — growth rate (%)

A	B	C	D	E	F	G
1980	35 735	0.90	2.28	.	69	10.0
1990	38 183	0.38	2.04	.	74	10.2
1993	38 505	0.23	1.85	.	72	10.7
1994	38 581	0.20	1.80	.	71	10.9
1995	38 609	0.07	1.61	.	70	11.2

A) Years, B) Estimated population in millions (31 Dec.), C) Annual population growth rate (%),
D) Total fertility rate, E) Contraceptive prevalence rate (any method) (%), F) Dependency ratio
of population at working age (%), G) Population aged 65 or over (as % of total population)

A	B	C	D	E	F	G	H	I	J
1992	60.2	76.6	45.4	51.8	12.3	0.88	1 518	14.6	5.4d)
1993	60.7	77.9	48.2	51.5	14.0	0.82	1 214	14.7	5.4d)
1994	62.5	79.1	50.7	51.1	15.6	0.78	1 063	14.6	5.3d)
1995	63.2	80.1	52.9	51.0	17.2	0.71	1 144	11.5	5.2
1996	62.0	80.8	54.9	50.8	19.3	0.78	1 218	12.3	5.5

A) Years, B) Full-time students per 100 people (at age 6-29), C) Secondary full-time net enrol-
ment ratioa) at age 15-18 (%), D) Secondary full-time net enrolment ratioa) (without basic
vocational) at age 15-18 (in%), E) Upper-secondary technical enrolmenta) (as % of total upper
secondary), F) Tertiary net enrolment ratiob) (as % of age 19-24), G) Public expenditures on
higher education (as % of GDP), H) Public expenditures per tertiary studentb) (US$), I) Public
expenditures on education (as % of total public expend.), J) Total expenditures on education
(as % of GDP)

a) without schools for adults, b) tertiary students (incl. all schools and institutions of tertiary education), c)
public expenditures only, d) estimates prepared by S. Golinowska on the basis of the data of : GUS, MPiPS, ZUS
and KRUS; for other years consolidated expenditures calculated by GUS on the basis of the data of the Finance

A	B	C	D	E	F	G	H	I	J
1992	435	295	37	6 613	24	7.1	8.1	.	.
1993	439	298	41	6 671	25	6.1	9.2	.	.
1994	441	308	43	6 893	25	6.3	10.6	.	0.1
1995	470	311	44	7 023	27	7.5	12.2	.	0.2
1996	455	337	45	7 176	37	6.8	14.0	.	0.6
1997	395	337	46	7 222	36	6.8	16.1	.	2.1
1998	209	313	48	7 314	38	6.1	19.1	.	5.0
1999	202	318	41	7 332	45	7.8	26.1	.	10.2

A) Years, B) Radios (per 1 000 people), C) Televisions (per 1 000 people), D) Annual museum
visits (per 100 people), E) Registered public library users (thous.), F) Book titles published (per
100 000 people), G) Printing and writing paper consumed (metric tons per 1 000 people), H)
Wire telephone subscribers (per 100 people), I) Fax machines (per 100 people), J) Mobile tele-
phone subscribers (per 100 people)

12 Employment

A	B	C	D	E	F	G	H	I	J
1992	45.6	27	32	41	119	-2.7	.	.	2.1[d]
1993	45.1	27	31	42	117	-2.9	.	.	2.0[d]
1994	44.4	27	31	42	113	0.5	.	42.3	2.1[d]
1995	44.0	27	30	43	109	3.0	.	43.2	2.1
1996	44.2	28	30	42	106	5.7	.	44.2	1.9

A) Years, B) Labor force[a] (as % of total population), C) Percentage of labor force in sectors[a] (%)— agriculture, D) Percentage of labor force in sectors[a] (%)— industry and constr., E) Percentage of labor force in sectors[a] (%)— services, F) Future labor force replacement ratio[b], G) Real earnings per employee annual growth rate[c] (%), H) Labor force unionized (%), I) Weekly hours of work (per person in manufacturing), J) Expenditures on labor market programmes[d] (as% of GDP)

a) according to the ILO definition of labor force; b) number of population aged 0-14 to one-third of population aged 15-59 ratio; c) monthly net earnings; d) estimates prepared by S. Golinowska for 1992-1994 on the basis of the data of: GUS, MPiPS, ZUS and KRUS; for other years consolidated expenditures calculated by

13 Unemployment

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1992	2394	13.7	12.4	15.2	27.2	31.1	62	68	38	42	0.9	0.8	3.9
1993	2595	14.9	13.6	16.5	29.4	34.2	58	63	33	40	1.0	1.2	3.6
1994	2375	13.9	12.3	15.7	29.3	34.8	60	68	37	47	1.2	1.8	3.7
1995	2233	13.1	12.1	14.4	28.7	33.7	59	64	37	45	1.6	1.8	4.0
1996	1961	11.5	9.9	13.4	23.4	29.5	58	64	37	43	1.6	1.4	4.0
1997	1737	10.2	8.7	12.0	20.5	26.5	53	62	30	38	0.8	1.9	2.6
1998	1827	10.6	9.3	12.2	21.3	25.6	51	62	30	41	1.5	1.4	1.7
1999	2641	15.3	13.0	18.1	28.5	37.0	55	59	29	33	.	1.1	.

A) Years, B) Unemployed people[a] (thous.), C) Total unemployment rate[a] (%), D) Unemployment rate by gender (%) — male, E) Unemployment rate by gender (%) — female, F) Youth unemployment rate (at age 15-24) (%) — male, G) Youth unemployment rate (at age 15-24) (%) — female, H) Incidence of long-term unemployment (%) more than 6 months — male, I) Incidence of long-term unemployment (%) more than 6 months — female, J) Incidence of long-term unemployment (%) more than 12 months — male, K) Incidence of long-term unemployment (%) more than 12 months — female, L) Discouraged workers (as % of total labor force), M) Involuntary part-time workers (as % of total labor force), N) Unemployment benefits expenditures (as % of total government expenditures)

14 Women and their participation in social development

A	B	C	D	E	F	G	H	I	J	K	L
1992	96.8	97.4	80.1	73.3	17	17	75.7	101	1.93	83	10
1993	96.9	97.5	81.6	74.2	20	19	76.0	102	1.85	79	12
1994	96.9	97.3	82.6	75.8	24	21	76.1	102	1.80	77	11
1995	97.0	97.3	84.2	76.2	28	24	76.4	102	1.61	69	6.0
1996	97.3	97.5	84.7	76.8	33	27	76.6	102	1.58	68	3.7
1997	97.9	98.1	83.3	79.9	39	32	77.0	103	1.51	65	

A) Years, B) Net enrolment ratio on level of education (%) primary[a] — female, C) Net enrolment ratio on level of education (%) primary[a] — male, D) Net enrolment ratio on level of education (%) secondary[a] — female, E) Net enrolment ratio on level of education (%) secondary[a] — male, F) Tertiary students[b] per 1 000 people at age 15+ — female, G) Tertiary students[b] per 1000 people at age 15+ — male, H) Female life expectancy at birth years, I) Female life expectancy at birth 1985 = 100, J) Total fertility rate value, K) Total fertility rate 1985=100, L) Maternal mortality[c] (per 100 000 of live births)

A	B	C	D	E	F	G	H	I	J	K	L
1992	38	62	65	183	82	446	71	242	.	.	.
1993	38	62	64	178	81	411	71	240	.	.	.
1994	34	52	62	176	76	317	66	198	.	.	.
1995	35	53	63	187	75	301	67	199	8.0	6.0	9.0
1996	35	55	61	170	75	300	68	207	8.0	6.0	9.0
1997	34	51	61	154	76	318	66	198	19.0	13.0	

A) Years, B) Members of Parliament, administrators and managers — female (%), C) Members of Parliament, administrators and managers — female as % of male, D) Professional and technical workers — female (%), E) Professional and technical workers — female as % of male, F) Office workers — female (%), G) Office workers — female as % of male, H) Service workers (including sales workers) — female (%), I) Service workers (including sales workers) — female as % of male, J) Women in Government — total (%), K) Women in Government at ministerial level (%), L) Women in Government — other levels (%)

A	B	C	D	E	F	G	H	I
1992	4 697	.	34	.	.	17,0	5.4	5.1
1993	5 114	.	33	.	4.0	16.9	5.4	4.7
1994	5 459	.	28	.	.	17.5	5.3	4.7
1995	6 350	3 221	29	.	.	15.6	5.2	4.6

A) Years, B) Real GDP per capita (PPP$), C) GNP per capita (US$), D) Share of total industry (as % of GDP), E) Income share[b] lowest 40% of households (%), F) UIncome share[b] — ratio of highest 20% of household to lowest 20%, G) Social security benefits expenditures[a] (as % of GDP), H) Public expenditures on education[a] (as% of GDP), I) Public expenditures on health[a] (as % of GDP)

a) for years 1992-1994 estimates prepared by S. Golinowska on the basis of the data of: GUS, MPiPS, ZUS and KRUS; for other years consolidated expenditures calculated by GUS on the basis of data of the Finance Ministry, b) employees` households

A	B	C	D	E	F	G	H	I	J
1992	1 861	2.2	49	21.0	.	.	.	225	86.2
1993	1 824	2.1	47	21.0	.	.	.	227	87.0
1994	1 817	2.0	47	20.0	.	.	.	230	88.2
1995	2 166	1.8	56	18.2	.	.	.	224	85.7
1996	2 226	1.6	58	15.0	.	.	.	207	

A) Years, B) Defense expenditures (current prices) US$ millions, C) Defense expenditures (current prices) as % of GDP, D) Defense expenditures (current prices) per capita (US$), E) Military expenditures (as % of educationand health expenditures), F) ODA disbursed (as % of defense expenditures), G) Exports of conventional weapons to developing countries (current prices) US$, H) Exports of conventional weapons to developing countries (current prices) (% of exports), I) Total armed forces[a] thous. of persons, J) Total armed forces[a] index 1990 = 100

**18
Resources
flow
imbalances**

A	B	C	D	E	F	G	H
1992	82	85.5	35	109.5	.	3.2	856
1993	76	83.5	38	107.8	.	2.7	-1 924
1994	82	104.3	42	101.3	.	3.4	-779
1995	79	96.8	41	101.7	35	6.5	-1 677
1996	66	85.7	43	97.3	.	6.5	-8 363
1997	61	93.2	48	99.4	.	5.9	-10 323
1998	61	95.5	48	104.3	.	6.8	-14

A) Years, B) Export-import ratio (exports as % of imports), C) Export growth rate (as % of import growth rate), D) Trade dependency (exports plus imports as % of GDP), E) Terms of trade (previous year = 100), F) Net workers' remittances from abroad (US$ millions), G) Gross national reserves (months of import coverage), H) Current account balance before official

**19
National
income
accounts**

A	B	C	D	E	F	G	H	I	J	K	L	M
1992	84.3	6.7	34.0	55.2	61.7	21.6	16.8	20.1	21.4	33.2	23.7	22.2
1993	85.9	6.6	32.9	52.7	63.0	20.5	15.9	19.2	23.7	32.3	22.9	22.0
1994	92.6	6.3	28.3	54.2	64.3	18.8	16.2	20.4	24.5	32.7	24.0	23.0
1995	126.3	6.4	29.2	50.6	61.2	16.6	18.7	20.7	22.5	29.8	25.6	23.2
1996	134.6	6.0	27.1	52.8	63.1	16.5	20.8	22.8	21.8	28.2	24.5	26.0
1997	143.1	4.8	25.8	56.7	63.5	16.1	23.6	25.4	21.0	26.8	25.7	30.0
1998	157.3	4.1	24.2	59.3	63.3	15.6	25.3	.	20.7	25.4	17.8	29.4
1999	155.2	3.4	23.6	60.0	64.6	15.4	25.5	.	18.3	22.5	17.7	29.6

A) Years, B) (US$ billions), C) Agriculture (as % of GDP), D) Industry (as % of GDP), E) Services (as % of GDP), F) Consumption private (as % of GDP), G) Consumption public (as% of GDP), H) Gross domestic investment[a] (as % of GDP), I) Gross domestic savings (as % of GDP), J) Tax revenue (as % of GDP), K) Central government expenditures as % of GDP, L) Exports (as % of GDP), M) Imports (as % of GDP)

**20
Natural
resources
balance
sheet**

A	B	C	D	E	F	G	H
1992	31 269	28.5	45.9	0.44	1.0	32.8	328
1993	31 269	28.5	45.7	0.44	1.1	29.0	319
1994	31 269	28.6	45.7	0.43	1.5	20.7	311
1995	31 269	28.6	45.7	0.42	1.6	19.6	313
1996	31 269	28.8	45.1	0.42	1.4	22.2	311
1997	31 269	28.9	45.0	0.41	1.7	17.9	305
1998	31 269	29.0	45.1	0.40	1.9	15.4	293
1999	31 269	29.1	45.2	0.40	2.1	14.0	292

A) Years, B) Land area (in 1 000 ha), C) Forest and woodland (as % of land area), D) Arable land (as % of land area), E) Irrigated land (as % of arable land area), F) Internal renewable water resources per capita (in 1 000 m^3 per year), G) Annual fresh water withdrawals as % of water resources, H) Annual fresh water withdrawals per capita (m^3)

A	B	C	D	E	F	G	H	I
1992	0.6	3.6	1.9	– 1.4	0.2	2 432	0.9	20.6
1993	0.6	4.2	2.1	3.4	7.9	2 512	0.9	16.6
1994	0.6	3.8	2.4	0.0	– 0.6	2 382	1.0	13.1
1995	0.6	3.8	2.2	1.8	2.2	2 456	1.3	11.6
1996	0.6	4.0	2.4	2.6	3.3	2 674	1.4	13.9
1997	0.6	4.0	2.1	– 6.7	– 3.7	2 553	1.5	14.6
1998	0.6	4.0	2.6	– 7.9	– 6.1	2 396	1.7	10.5
1999	0.6	1.7	3.1	– 0.5	– 1.1	2 222	1.8	12.0

A) Years, B) Production of energy as % of national energy reserves[a] — coal, C) Production of energy as % of national energy reserves[a], natural gas, D) Production of energy as % of national energy reserves[a] — crude oil, E) Commercial energy production average — annual growth rate (%), F) Commercial energy consumption — average annual growth rate (%), G) Commercial energy use (in oil equivalent)[b] – kilograms per capita, H) Commercial energy use (in oil equivalent)[b] – GDP output (US$) per kilogram, I) Commercial energy imports (as % of merchandise exports)

A	B	C	D	E	F	G	H	I	J
1992	363 000	.	.	.	3 444	.	.	.	.
1993	372 000	1.7	9.8	.	.	.	37.3[a]	.	.
1994	348 000	.	.	.	3 188	.	38.5[a]	.	.
1995	330 000	.	.	.	3 866	1.1	41.5	.	.
1996	373 200	.	9.3	.	5 164	1.2	42.7	.	.
1997	362 300	.	9.3	.	.	1.2	46.6	.	.
1998	338 095	.	9.3	.	.	1.2	49.2	.	.
1999	.	.	9.3	.	.	1.3	51.5	.	.

A) Years, B) Greenhouse gas emissions (CO_2) — thous. of tons, C) Greenhouse gas emissions (CO_2) — share in world total, D) Major protected areas (as % of national territory), E) Spent fuel produced (metric tons of heavy metal), F) Hazardous waste production (in thous. tons), G) Municipal waste generated (in m³ per person), H) Population served by municipal waste services (%), I) Waste recycling (as% apparent consumption) — paper and paper-board, J) Waste recycling (as% apparent consumption) — glass

a) urban population

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