lems are focused on information handling and processing.

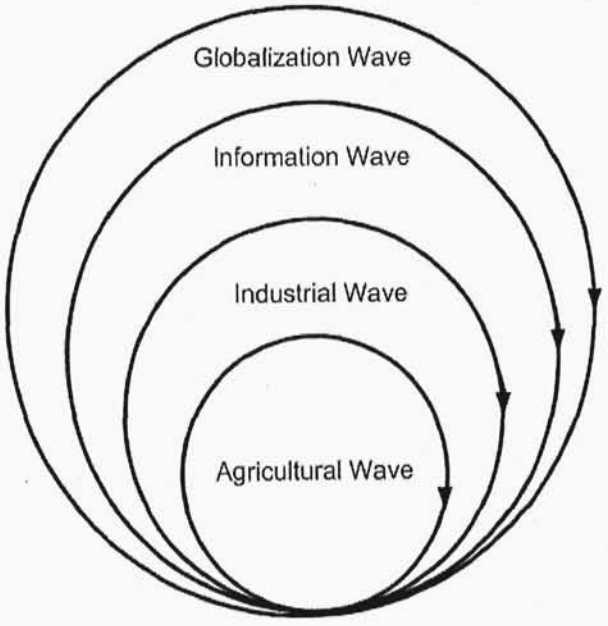
For example, the levels of ICT advancement in both the United States and Singapore are high. However, the proportion of information to material activities in the U.S. is much higher than in Singapore, although that city is still involved in manufacturing American goods. Does this mean that there is no information society in Singapore? Singapore is an automated state-city with some solutions that are not conceivable in the U.S. Are both states at the level of an information society? At this moment, we may say that the U.S. has entered the "informed" society level while Singapore is at the level of the "informative" society. (See below for elaboration of these and related technical terms.)

Alvin Toffler (1980) offered a very elegant concept of civilization development through three waves of agriculture, industry, and information. Later, Alvin and Heidi Toffler (1994) became advocates of the "new civilization," because they perceived the information wave as replacing the agricultural and industrial waves. Is bread being replaced by "Windows XP" or a car by the Internet? That will not happen. The next wave includes the previous ones as illustrated in Figure 14-3. The quality of any information society depends on the quality of the previous societies. In other words, the information society is not exclusive but inclusive. The relationships among these societies determine the quality of life in the information society.

TYPES OF THE INFORMATION SOCIETY

The term "the information society" was sufficiently descriptive in itself when it was first described 30 years ago. Nowadays, the information society is being developed in several mutations. Some types of the information society are:

Figure 14-3. The inclusiveness of civilization waves



The Data (Dossier) Society: A Big Brother Control

The industrial revolution made it possible to "process" materials, such as coal, metal, and cloth, at unprecedented volumes and speeds. Such acceleration of material processing increased the demand for "control" of industrial operations. For instance, the many problems of scheduling and coordinating in the early days of the railroads resulted in missed connections or accidents, leading initially to such coordinating mechanisms as the invention of standardized time zones. According to Beniger (1986), the control revolution is a watershed transformation in capacities of "information processing," as the industrial revolution was in material processing.

The control revolution created punch-card machines in the 19th century and computers in the 20th century. Almost the first 100 years of mediated information handling was involved in data processing for the purpose of accounting and management. As the industrial revolution marked the discontinuity of coupling energy, data processing played the same role by exploiting business data/information. The emergence of information processing equipment, whether punched cards or computers, led first to the development of transaction processing and later in the 1970s to online transaction processing applications (OLTP).

With computers quickly becoming the modus operandi of government and business, a number of questions have developed. How do they fit into the political landscape? How are they designed and implemented? How are ethical and policy judgments made? The Dossier society defined by Laudon (1986) places computers in the context of the Constitution.

The genius of American politics is its balance more in favor of individual freedom and diversity than of organizational demands for control and efficiency. Contemporary ICT can radically alter the organization of power in the United States and with it our traditional conceptions and experiences of individual freedom, security, and privacy. The other side of the data society is a "dossier society." According to Kenneth Laudon, from a technical point of view, the dossier society is the integration of distinct files serving unique programs and policies into a more or less permanent national database. It may lead to an aggregation of power in the federal, state and local governments without precedent in peacetime America. The dossier (data) society can expose the life of an individual to governmental screening and composite analysis that can be analytically "right," but is not reflective of the reality of the individual's life. Even if the analytical screening is right, may the government penetrate the privacy of the individual? Do we not have the right to shadow some of our citizens' lives? The Bush administration in 2000 had problems with the foreign intelligence surveillance act, which tried to give the Government too much power in this process, which was later watered by Congress.

Most Americans want a society where criminals are effectively brought to justice. Most Americans also want a society where government programs are effectively and efficiently administered using, where necessary, advanced ICT. Power is limited by segmental authority, segregation of information flows, creation of multiple checkpoints, and encouragement of lengthy and slow deliberation. These practical principles are at odds with the capabilities and premises of contemporary ICT applications.

In 1984, Congress signaled a virtual retreat from the Privacy Act by passing the Deficit Reduction Act of 1984, which contained provisions establishing a de facto national data center capability. Congress required all states to participate in file merging, matching, and linking programs to verify the eligibility of beneficiaries in food stamps, Medicare, aid to families with dependent children (AFDC), and a host of other "needs" and insurance-based programs. Involved here is the systematic merging and linking of social security, medical, and personal data with Internal Revenue

and private employer data. These "matching" and "linking" programs are "limited" to about 50 million Americans (Laudon, 1986). There are no technical barriers to extend them to corporations like Ford, CitiBank, Coca-Cola, Kellogg, or the American Medical Association and other professional interest groups. Then the dossier society will become a reality as it was in East Germany (Stasi-1950s-1991) and still is in Russia, where the top politicians, including the president come from the secret police (KGB).

The Computer Society: A New Social Tool

In the 1960s, the evolution of computer applications progressed from mathematical computation to information processing and even to real-time control. Computers increasingly catalyze the growth of scientific information and human control through computer-aided system development. By the end of the 1960s, with the development of online terminals, computer access had been broadening along with the idea of the computer-serviced society. The emergence of the computer society was a result of social information systems. The trend of these applications may be charted through three stages: human information systems (libraries), industrialized man-machine systems (factories), and man-machine digital systems (online banking). The first stage corresponds to primitive and underdeveloped societies, the second to the advent of machines operated through controlled power, prominent through the first industrial revolution, and the third to the progressive computerization of advanced industrialized societies since World War II. The computer society was then projected as a possible new utopia, destined for oblivion or success in proportion to man's capability to chart and control his own evolution (Sackman, 1967).

From today's point of view, the computer society is mostly preoccupied with the issue of how to apply computers. This issue became particularly popular in the United States in the 1980s with the advent of personal computers. The issue is still popular in developing and less developed nations which are at an early stage of computer literacy.

The Informative Society: A Way of Processing Information

A combination of features from the data-dossier society, industrial society, and computer society creates the informative society. The informative society transforms the way business, government, and citizens work. It is helping organizations get leaner, smarter, and closer to the customer. Those who seize the opportunities inherent in this revolution are capturing important competitive advantages. Those who lag behind are forced to scramble breathlessly to catch up, or to go out of business.

The informative society is the result of the merged data and computer societies based upon advanced software such as online analytical processing (OLAP). OLAP software, such as data warehousing and mining, transforms OLTP into value-added information. In the mid 1990s, data warehousing became one of the buzzwords of the ICT industry. However, it was invented by real companies to make use of vast volumes of databases. During 1965-1999, almost every aspect of data processing was automated in the name of efficiency. With the increased power of ICT, more complex systems could be implemented. For example, from simple bookkeeping applications, the banking industry moved to ubiquitous automated teller machines (ATM), which can provide a good base for customer behavior analysis and further the development of customer-based relation banking.

In the 1990s, IBM evaluated how to move from a computer- (hardware in mind) based business to managing a business based on information (software in mind). This led to the concept of data mining in order to extract a new value of informa-

tion in the business context. The solution to this quest is data-warehousing software, in which a single, complete, and consistent store of data from internal and external sources is delivered to end users who can process data into information in the business context (Devlin, 1997).

"Informative systems" were defined in the U.S. by Zuboff (1988) in her popular book *In the Age of the Smart Machine*. "The Smart Machine" is applied to transform the nature of work and can provide negative (alienation) and positive (empowerment) results. However, that same technology may "informate," empowering ordinary working people with a broad knowledge of the production/service process, making them capable of critical judgment about production/service. The author argues that systems should be informated rather than automated.

The informative society is a community of developers and users who understand which data/information to process in order to achieve added value in decision making both at the personal and the organizational level. This elite community, which is no longer in the computer society, struggles with the issue of how to apply "Windows XP or a scanner." Members of the informative society are better informed than members of the previous societies, since they use meaningful information in a given context instead of merely applying data to decision-making.

The Networked Society: A New Social Super-Connectivity

In the networked society, home computers are as common as the telephone. These electronic appliances link people to people, shrinking time and distance barriers among them, and nearly eliminating barriers between people and information. In its simplest form the networked society is a place where thoughts are exchanged easily and democratically and intellect affords more personal power than a pleasing appearance does. In *The Network Nation,* Hiltz and Turoff (1993) write:

'The Network Nation or Society' is a collection of communities with overlapping networks for actual and potential communication and exchange. We will become the Network Nation, exchanging vast amounts of both information and social communications with colleagues, friends, and 'strangers' who are spread out all over the nation and share similar interests. ... Ultimately, as communication satellites and international packet-switching networks reach out to other cities and villages around the world, these social networks, facilitated by computer-mediated communications, will become international; we will become a 'global village' whose boundaries are demarcated only by the political decisions of those governments that choose not to become part of an international communication.

The networked infrastructure can be utilized to substitute for the use of limited physical resources. In the 21st century, we will probably see:

- Increased scale and distinction of community-oriented networks for academia, government, business, politics, social aspects and other purposes
- A variety of virtual educational institutions
- "Networked" organizations, with flatter, more consolidated and better connected structures of firms, and changes in the nature of work ("End of Job")
- The integration of ICT resulting in "super-connectivity" for all those users with an access to networks

The networked society applies ICT to produce a culture and systems supporting the service-material base. Analyzing the potential for conflict among new information and communications opportunities, one can identify five major areas in which public policy issues are likely to arise[1]:

1. Equitable access to information and communications opportunities

2. Security and the survivability of the network infrastructure
3. Interoperability of the network infrastructure
4. Modernization and technological development of the network infrastructure
5. Jurisdiction in formulating and implementing national information policy

The network society operates in cyberspace, which is a new social space that shapes networks into "networlds," the global matrix of minds, stimulated by interconnected computer networks. Komito (1998) perceives the following categories of the networked society: moral, normative, and proximate communities. These communities are generated by the networked society, which becomes a foraging (constantly searching for "something") society of flexible communities.

Network diffusion modifies the operation and outcomes of trade (*e-commerce*), production (*computer-integrated manufacturing*), experience (*end-user computing*), power (e-republic), and culture (*icons*). Castells (1996) argues that the presence or absence in the networked society and the dynamics of each network vis-a-vis others are critical sources of domination and change in our society; a society that is characterized by the preeminence of social structure over social action. In other words, the power of flows (constant searching and switching scopes of interest) takes precedence over the flows of power.

The Mass Media Society: Provided Consciousness

The term "mass media" means communication by such media as television, radio, newspapers, and books. The most distinguishing characteristic of mass media communication is that it is mostly one-way. To attract as large an audience as possible, the media are addressed to the largest number of people, very often at the lowest common denominator.

Since the advent of television, mass media have created the mass media society, which is stimulated by the media as informers, interpreters, persuaders, entertainers. The mass media democratic society is strongly influenced by the media that become the fourth estate ("a quasi-fourth branch of government"), after the executive, legislative, and judicial branches.

Today, in developed nations, electronic voting and opinion-registering technologies make a two-way flow of what was once a one-way pipeline, with information no longer going just from the top down, from lawmakers to people, but now also from the bottom up, from the people back to the lawmakers. A new political system is emerging, as the mass media society is entering the status of electronic republic (Grossman, 1995).

America is turning into an electronic republic, a democratic system that is vastly increasing the people's day-to-day influence on the decisions of state. This transformation is triggered by the remarkable convergence of television, telephone, satellites, cable, and personal computers. The electronic mass society is heading from representative democracy toward direct democracy, a form that originated in the first millennium B.C. in small, self-contained Greece. At the beginning of the 21st century, in democratic nations, the electronic mass media society is transforming the isolated citizen into an electronic citizen, who feels that his/her vote may have some meaning in pursuing the common good.

The Virtual Society: Anyone, Anywhere, Anytime

The virtual society is a community which operates in cyberspace, generated by computer networks, software, e-files, and interactive dialogues among the participants. The virtual society's members interact among themselves without physical presence and interact with organizations that are digital. Virtual corporations, communities (e.g., WELL in San Francisco), shops, schools,

and agencies broaden and intensify the social and business interactions of the virtual society. Agres, Edberg, and Igbaria (1998) argue that the "virtual" empowers individuals who can easily interact within the digital environment. The individual can be electronically present in more digital places than he/she could manage to be in the same range of physical localities. The virtual society's members are better communicated and informed. Virtual cyberspace may enhance job performance and training, improve product design, assist surgeons, and create interactive forms of entertainment. But it will be years before that becomes a reality, if it ever happens at all.

The Communicated Society: Familiarity of Events and Facts

The application and dissemination of omnipotent ICT may transform the United States, Western Europe, and Japan into a "technopoly," which has sovereignty over social institutions and national life, and becomes self-justifying, self-perpetuating, and omnipresent. Postmen (1992) traces the historical movement of technology from being a support system for a culture's traditions into being an agency competing with them, and finally, to creating a totalitarian order with no use for tradition at all. However, if it includes a strong insistence on the value of free speech, ICT may make citizens better informed. Of course, to do so, the communicated society should pass the stages of mass media, networks, and virtual societies.

The Informed Society: Awarded Members

The informed society is created when the informative and communicated societies achieve the status of mature entities. The informed society's members are characterized by a good level of awareness and sense of what is going on in the society and the economy. The members of such society can make wise decisions based on their own judgment, which is supported by data-mining technologies, as well as networked and enterprise-wide systems and services. This society is a computerized society at the level of social sophistication and finesse.

The Robotized Society: Automated Judgment

The robotized society is composed of robots, even thinking robots. These robots' behavior is based on the rules of artificial intelligence. Robots may not be the best of musicians, but they can be used for testing instruments as if they were manufacturers. If we are to use robots on a large scale, and if technological advances toward the "thinking" computer continue, it will become necessary to lay down guidelines governing where and how they are used. Isaac Asimov (1950; 1985) proposed Three Laws of Robotics:

1. A robot may not injure a human being, or through inaction, allow a human being to come to harm.
2. A robot must obey the orders given to it by human beings except where such orders would conflict with the first law.
3. A robot must protect its own existence as long as such protection does not conflict with the first or second law.

Robots in the real world do not look a bit like most examples we have grown used to in films and stories. But they are still extraordinary devices and far more clever than machines of earlier times (Asimov, 1985). Their ability to accomplish simple, repetitive tasks in a broad range of applications may cause unemployment and a demand for highly skillful workers. On the other hand, if they are applied in very complex systems and prove to be highly reliable, then their applications can be useful and recommended.

The Knowledge Society: Understanding Members

In *Post-Capitalistic Society,* Peter Drucker (1993) describes how every few hundred years a sharp transformation has taken place and greatly affected society—its world view, its basic values, its business and economics, and its social and political structure. According to Drucker, we are right in the middle of another time of radical change, from the Age of Capitalism and the nation-state to a knowledge society and a society of organizations. The primary resource in the post-capitalistic society will be knowledge, and the leading social groups will be "knowledge workers." The industries that moved into the center of the economy in 1958-1998 have as their business the production and distribution of knowledge and information rather than the production and distribution of things. Microsoft's market value exceeds the market value of three big car makers, General Motors, Ford, and Chrysler. Why? Microsoft employs only 50,000 workers but they produce $400,000 per capita per year. Their knowledge is costly.

The super-rich of the old capitalism were the 19th-century steel barons like Andrew Carnegie, robber barons like Jay Gould, oil barons like John Rockefeller, and transportation barons like Cornelius Vanderbilt. The super-rich of the knowledge society are computer makers (Steve Wozniak, Steve Jobs), software makers (Bill Gates), and systems developers (Ross Perot). Knowledge becomes an economic resource and a tool of genuine innovations that provide a competitive advantage in business. Knowledge is a set of rules, laws and their systems that communicate by information handling and processing. The major drivers of the development of a knowledge society are the demand for innovations in the marketplace and a lifelong learning process which requires permanently improving work conditions and creates higher productivity and effectiveness.

The knowledge society applies tools needed for problem solving. Among these tools one can mention high-speed computers, information retrieval services, and networks of talent groups.

The Learning Society: Developing Members

The development of the knowledge society requires constant discovery, assimilation, and organization of knowledge. These processes constitute learning activities, which at the beginning of the 21st century require skillfully swimming in the ocean of information, artfully using information-rich sources, and using a supporting learning environment to self-pace and self-structure the user's own programs of learning. The learning society gets its major input from higher education and provides its output to employers (MacFarlane, 1998).

The learning society is created not only by higher education institutions but also by "learning organizations" in business, industry, government, and non-profit units. "Learning organizations" overcome learning disabilities to understand threats clearly and recognize new opportunities. Not only is the learning organization a new source of competitive advantage, it also offers a marvelously empowering approach to work, one which promises that as Archimedes put it, "with a lever long enough...single-handed I can move the world" (Senge, 1990).

The paradigm of the learning society is understanding and its purpose is to strengthen human planning and behavior in complex environments, such as the modern global economy.

The e-Global-Universal Society: Justice and Peace for a Whole Planet

As a result of learning, people and their governments who promote a global economy may try to create a formal, global, universal society. The

global economy is based on free movement of goods, services, capital, and ideas. The globalization of financial markets means that the movement of exchange rates, interest rates, and stock prices in various countries are intimately interconnected. Global integration has brought the benefits of the international division of labor, economies of scale, and the rapid spread of innovations from one country to another. However, the global economy is the global capitalistic system, which is not without problems, as Soros (1998) writes in his quest for the global open society.

The organization of the global-universal society is needed because such a society must regulate deficiencies in the global capitalistic system. Among these deficiencies, Soros lists the uneven distribution of benefits, the instability of the financial system, the threat of global monopolies and oligopolies, the ambiguous role of the state, and the question of values and social cohesion. Since global markets reduce everything to commodities, we can have a market economy but we cannot have a market society. Globalization increases the demands on the state to provide social nets while reducing its ability to do so. This creates the seeds of social conflict. This may lead to a new wave of protectionism and the breakdown of the capitalistic system, as happened in the 1930s.

To prevent the next breakdown of the capitalistic system, one must organize the global open society, which is governed by the rule of law: respect for human rights, respect for diversity, respect for minorities and minority opinions, division of power; and a market economy in the electronic environment. Of course, the e-global-universal society is organized around information and by networks and around common-complementary values of universal-complementary civilization[1]. This society requires many alliances (including virtual) that will establish a code for international patterns of expected behavior. Such alliances will apply information, computerized networks to disseminate and enforce these standards. Some such alliances are The World Trade Organization, NATO, and the World Tribunal. Unfortunately, the United Nations is an organization designed only for peacekeeping, not for other concerns. This global society should be open and communicated, which means that it will be effective if it works as an e-global-universal society. This means that it should be based on democratic principles and global justice for all inhabitants and their natural surroundings.

The Self-Sustainable Society: Surviving Members

The death triangle of mankind, composed of the expected bombs in population (2050), ecology (2050), and resource depletion (2300), is two generations away from the generation of 2000 *anno domini*. The next 42 years (2000-2050) are crucial for the survival of mankind. If we look back at the last 50 years, we see that this period passed so quickly and produced positive results never before known in world history. It also created the threat "to be or not to be" for humans on Earth. The next 50 years are just a period of two generations. If we miss these generations, we also will miss the opportunity to educate them and we will be overwhelmed by the complexity of the coming crisis and probable failure of human civilization. Although people, cultures, and nations have done this for centuries, the death triangle of mankind has never before been so close.

A new society with new politics should be defined in the first part of the 21st century and implemented in 2025-2050. Otherwise mankind may disappear from the Earth. The targets for the 21st century can be defined as follows:

1. To achieve sustainable and diversified culture
2. To achieve mass consumption of green products from regenerative food and fiber systems through biodiversity (Dahlhberg, 1993)

To achieve these targets, the way goes through the development of the non-material society (value-driven) and self-sustainable society (survival-oriented).

The modern scourges of Western civilization, such as youth suicide, drug abuse, and crime are usually explained in personal, social, and economic terms: unemployment, poverty, child abuse, family breakdown, and so on. However, the author suggests that these trends are to a certain degree independent of such factors. These curses are rather caused by a failure to provide a sense of meaning, belonging, and purpose in our lives, as well as a framework of values. A person needs to have something to believe in and live for, to feel he is a part of a community, a valued member of society, and to have a sense of spiritual fulfillment—that is, a sense of relatedness and connectedness to the world and the universe in which people exist.

The self-sustainable society should be the next step in social development. It should provide an orientation on values (e.g., family), norms and attitudes and the spiritual life. In other words, we have to reinvent culture in such a way that it will be sustainable. Moller (1993) argues for the need to emphasize inputs from different cultures in order to amalgamate a single concept for all of us. This transformation can be achieved if the learning and global open societies are to form a mature mankind.

The Monitoring Society: Limited Communication

If we do not secure feeding and caring for the 10 billion people who are likely to be alive within a couple of generations, then we have to secure the minimal means of social communication. It can be organized through the application of satellites or by primitive monitoring by the sound of African tum-tum drums. Such an environment will be managed by the monitoring society, which will be very limited in technology and other resources. It may be the beginning of the end of mankind.

THE PARADIGMS AND MEASUREMENTS

The issue of how to measure the information society preoccupies the research of several authors. Measurements of the information economy were offered by the previously mentioned authors, Machlup (1962) and Porat (1979). Hudson and Leung (1988) applied Porat's method to measure the information society of Texas. The Jahoda Index (Ito, 1981, p. 674), applied by Japan's Research Institute of Telecommunications and Economics (RITE), has ten components and does not even include such words as "computers," "software," or "networks." This index is almost 20 years old and does not reflect the ICT and IM solutions that are fruits of the Information Age and Telecommunications Age. About five years later, the Japanese Information Processing and Development Center offered the JIPIDEC Index. This index includes such categories as "hardware," "software," and "transmission."

Do these measurements define the information society (Dordick & Wang, 1993). To answer this question, a new set of measuring indexes has been offered in Table 14-2. These measurements are from the citizen's (user's) point of view, and explore how ICT penetrates the population and what type of paradigm, purpose, and main solutions are provided by each type of information society.

Of course, the information society can be perceived at different levels of the population. The most popular level is the nation; however, one can analyze the information society at the level of a region or city as well as at the level of an organization. In other words, in the same nation, as well as in the same large organization,

Table 14-2. The paradigms and measurements of information societies

IS Type	Paradigm	Purpose	Main Information Solution	Measures Per 1,000 population
Data (Dossier)	Measurement	Reduction	Mechanization and Automation, Off-line systems	Number of data entry personnel
Computer	Measurement	Reduction	Automation and How to compute? Off-line systems	Number of computers
Mass Media	News	Dissemination	Printing	Number of newspapers, and Number of TV sets
Networked	Connection	Exchange	Internet, Intranet, Networked enterprise	Number of Internet Users, Number of Intranet servers
Virtual	Electronic presence	Exchange and Opinion	Internet, Intranet Virtual enterprise systems	Number of bulletin board systems (national and organizational)
Informative	Optimization	Decision-making	What to process? Data mining, Online systems, Application Portfolio	Number of OLAP software per organization, % of GDP spent on IM, % of I-workers in the labor force
Communicated	Familiarity	Planning	Networking, Online systems, Networked enterprise	Number of Internet users, Number of telephones, Number of TV sets and Number of newspapers, % of GDP spent on telecomm.
Knowledge	Rules	Understan-ding	Research, education Information retrieval	Number of scientists, Number of professors, Number of students
Robotized	Rules	Decision-making	Automation of judgment	Number of expert systems
Informed	Awareness	Decision-making	Data mining, Networking, Enterprise-wide systems	Number of OLAP software, and Mass Media and Network Indexes, Free press
Learning	Understan-ding	Planning and acting	Computer-aided instruction, Information retrieval, Digital library	Number of published books, Number of digital books and scientific documents
e-Global	Justice	Operations	Virtual government e-Global systems	Number of applied virtual global agencies
Self-sustainable	Optimization	Survival	Green economy Ecological systems	Amount of energy from renewable sources
Monitoring	Warning	Survival	Satellites or tom-tom drums	Number of served people

there can operate different types of information societies.

THE DEVELOPMENTAL PATHS OF INFORMATION SOCIETIES: FUTURE TRENDS

The developmental paths of information societies are presented in Figure 14-4. The model is self-explanatory with the exception of the expert society. The main idea of the model is based on the prerequisites required in order to move to the next developmental stage. For example, the informed society can launch its operations if its members pass through the stage of the informative and communicated societies. The application of artificial intelligence may help in many areas of civilization; however, it requires advanced knowledge among developers and only limited skills among operators of expert systems. Therefore, too many applications of robot systems may lead backwards to the computer society, where the main challenge is how to apply the system. On the other hand, some limited applications of expert systems in technological environments that are too complex may help the informative and learning societies in their operations and developments.

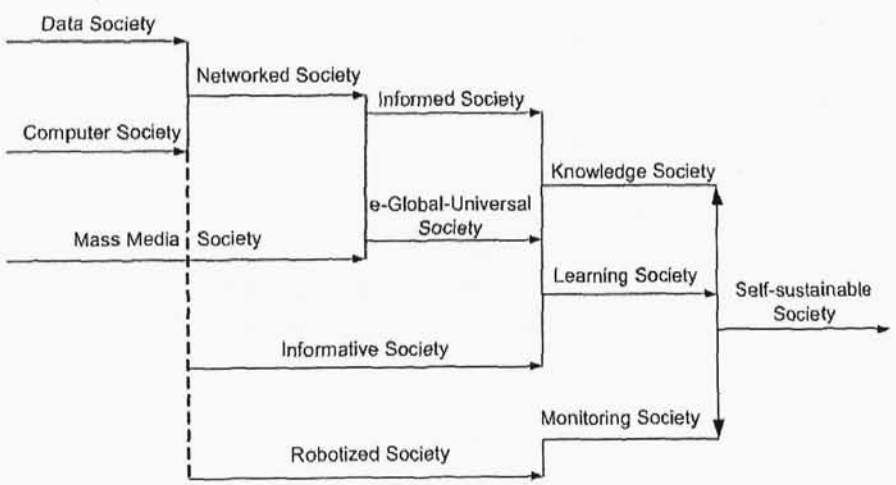
A CASE OF THE POLISH INFORMATION SOCIETY (2008-2013)

Poland, since the fall of communism in 1989, continues to approach a comprehensive strategy of developing ICT, particularly in respect to the Polish information society (PIS). The first time this kind of approach was attempted occurred in 1971-74 when the concept of the National Information System, driven by INFOSTRADA, had been tried and some its elements had been implemented (Targowski, 1980; 1991, Figure 10-14).

The following is a sketch, developed by the Author, of the strategy of the development of PIS for 2008-2013. This strategy, submitted on behalf of Ernst & Young, won an international competition hosted by the Polish government in May 2008.

The Polish information society is composed of the following members:

Figure 14-4. The paths of the informative society's development

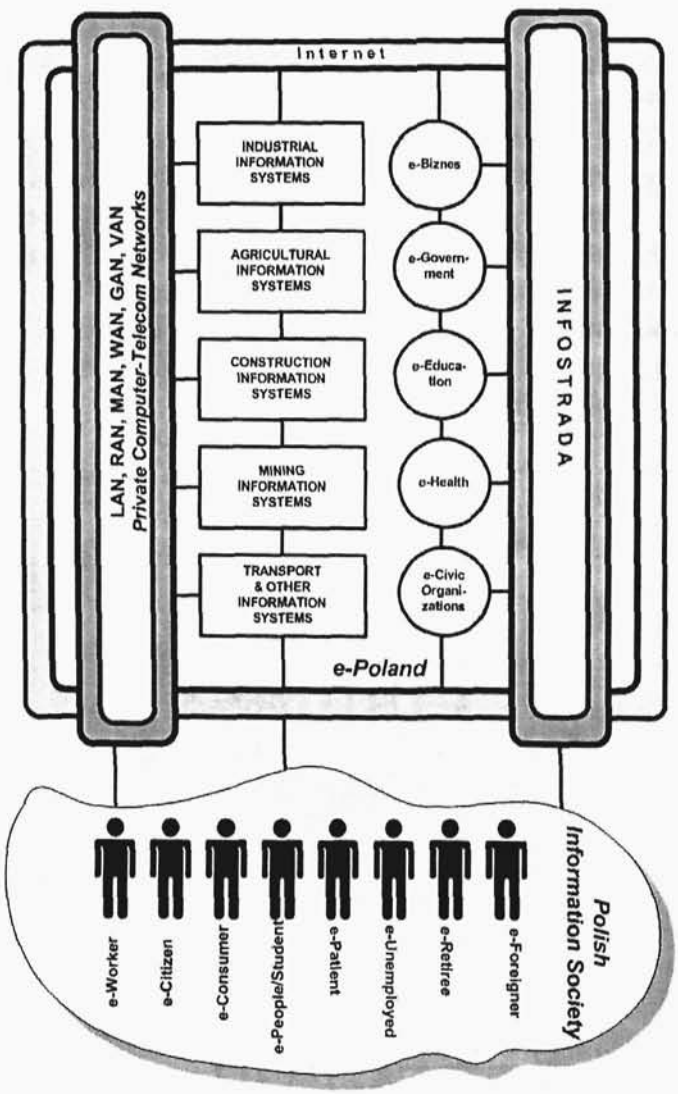


- e-Citizen
- e-Worker
- e-Consumer
- e-Pupil/Student
- e-Patient
- e-Unemployed
- e-Retiree
- e-Foreigner

- Business private networks LAN, RAN, MAN, WAN, GAN, VAN
- Government private network INFOSTRADA
- Public network – the Internet
- Information systems for sectors of the economy
- E-systems for business, government, education, health, civic organizations

A model of the PIS is depicted in Figure 14-5 and is composed of:

Figure 14-5. The architecture of the Polish Information Society (The Targowski Model 2008)



All these networks and systems are components of PIS and are being developed with the following aims:

- **Credo**: Polish information society is a key to knowledge and prosperity
- **Mission**: To wisely steer agricultural, industrial, information, global, knowledge, nano-tech, and bio-tech societies in order to make Poland a modern, prosperous and citizen-friendly state where decisions are made on advanced information and knowledge.
- **Goal**: To optimize the development and operations of all stages of society in such a way to minimize the use of strategic resources and increase the options for more life choices for people and their quality of life, based on full employment.
- **Strategy 1**: To develop 12 main e-services for people and eight e-services for businesses (defined by the European Union and e-Voting) as well as e-HELP (monitoring crises & catastrophes) and CYBERSHIELD (to defend the Polish cyberspace) functioning through the INFOSTRADA, a government network (Figure 14-6)
- **Strategy 2**: To develop tele-cities as a local information infrastructure, provided an access to global, national, and local systems from home, work, and public points of Internet access (PPIA) via business private networks (MAN/RAN), governmental INFOSTRADA, and wireless fidelity municipal area network (Wi Fi MAN) (Figure 14-7).
- **Strategy 3**: The development, implementation, and operations of PIS require a wise and flexible coordination at all governmental levels by appropriate CIO and PIS operators, as it is explained in a model in Figure 14-19.

The e-government's services should be developed according the stages defined in Table 14-3.

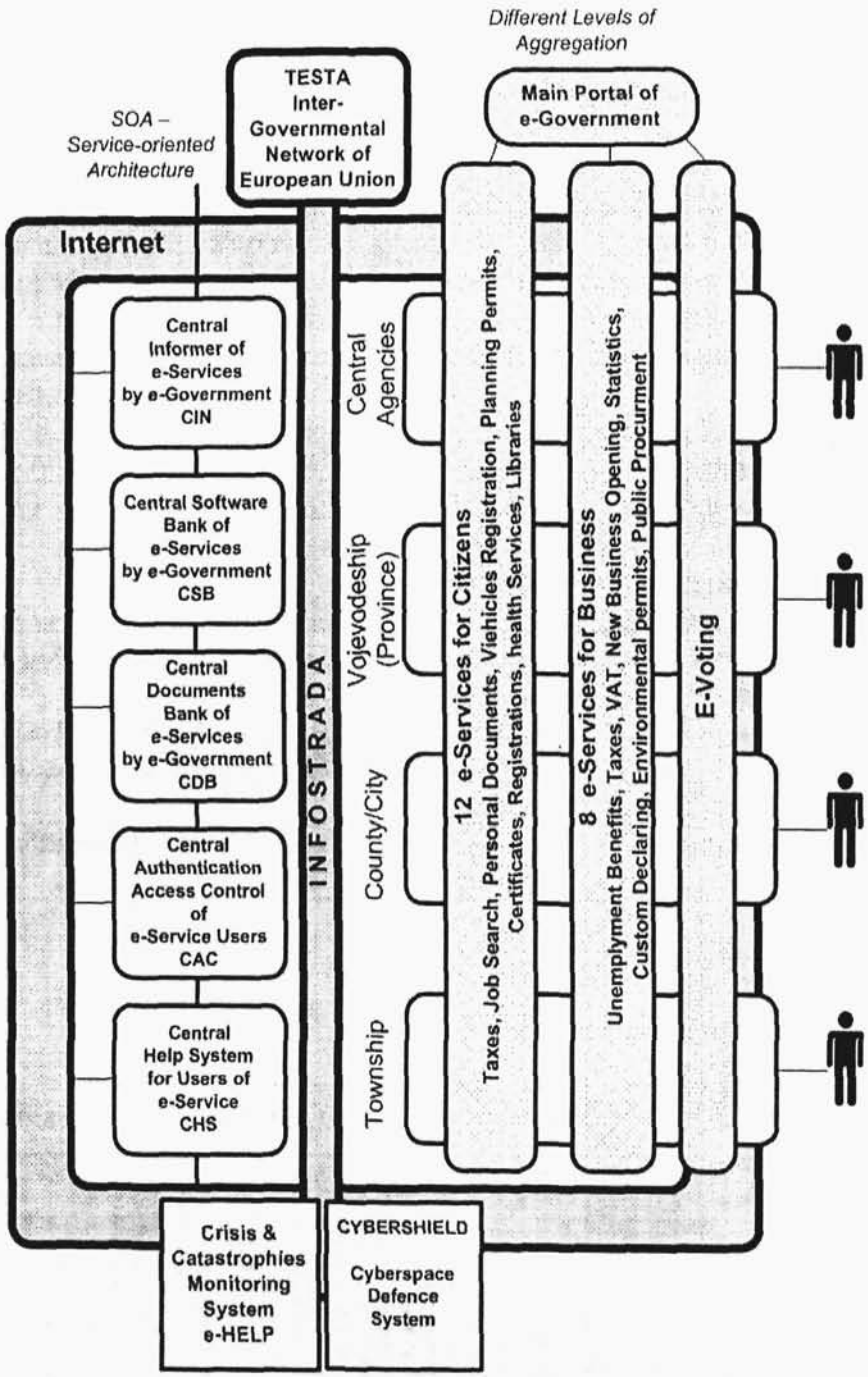
The transformation of a Polish local citizen into a global citizen's purposes are as follows:

1. To develop a positive role for a Pole in global employment or business

Table 14-3. Stages of e-government's services

STAGE	RESULT OF e-SERVICE	A WAY OF DELIVERING e-SERVICE
0	Off-line	There is no service in the Internet
I	INFORMATION	e-Access to information of how to handle e-Service
II	DOCUMENT	e-Printing a document
III	INTERACTION	e-Printing, filling out and legally signing an e-Document
IV	SINGLE TRANSACTION	Complete handling of the whole transaction, including e-Payment
V	MULTIPLE TRANSACTIONS	Complete handling of multiple transactions, including e-Payment from a single access point
VI	CLIENT'S INTENTION	Application of the CRM approach towards a citizen as a welcomed client who, if satisfied, should return to the agency

Figure 14-6. The architecure of Polish e-government (The Targowski Model 2008)



2. To make a Pole more active in participation in the emerging global civil society, which should have some regulatory role in operations of the global economy

The number of international NGOs (non-governmental organizations) has grown from 1,000 in the 1950s to 20,000 in 1999. In the scope of transnational social movement organizations (TSMO), the growth in the same period is tenfold, from 100 to 1,000. For example, the French citizens are the most active; they belong to 553 TSMO and 3,551 INGOs. At the second end, the scale there are such countries as Afghanistan, Northern Korea, and Oman (Yearbook of International Associations [Union of International Associations]; 2004).

Poland is among 25 nations most active in INGOs and TSMOs, which include the most developed nations.

If globalization is unstoppable, then the global civil society should regulate globalization soon by the increased activism and awareness of issues and their solutions.

A model of a Polish inhabitant functioning concurrently in the three civilizational spaces is shown in Figure 14-7. A Pole does not have to leave his/her local space to be active in national and global spaces. The Polish information society should allow him/her to do so. His two "virtual spaces" are tested in his/her physical local space according to the rule "act locally, think globally."

The presented architectures of the Polish information society do not explain issues triggered by it, such as *digital divide, surveillance* and *democracy's improvements*. However, e-voting helps in solving the last issue since the Poles do not participate in votes in large percentage. At this moment in time, the Polish information society should help Poland in all of its transformations.

Figure 4-7. A citizen as an inhabitant of three civilizational spaces concurently (The Targowski Model 2008)

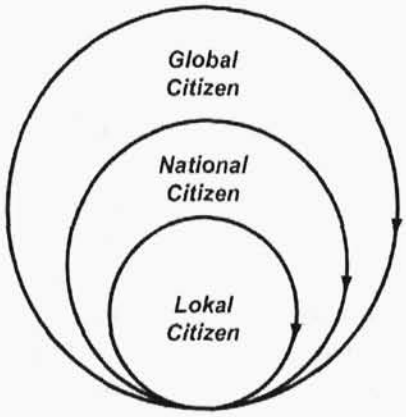
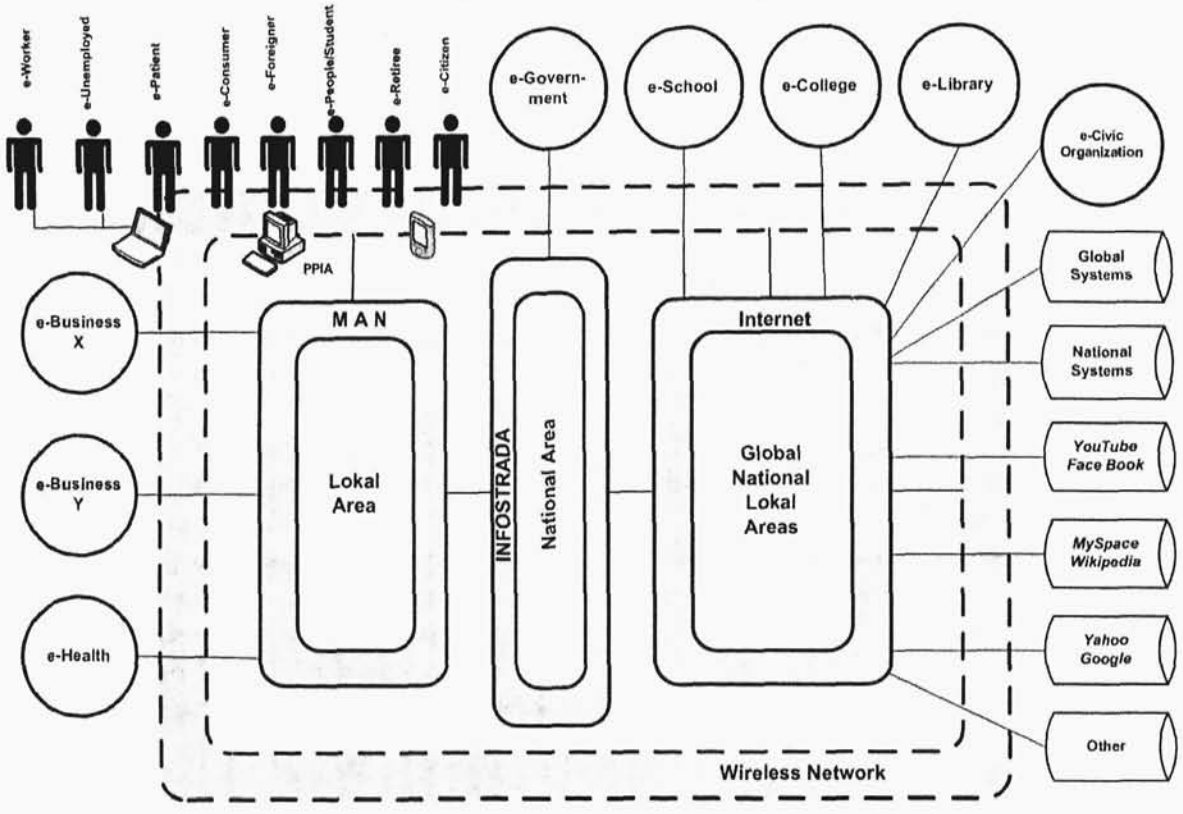


Figure 14-8. The architecture of a teleCITY (PPIA-Public Points of Interest Access, MAN-Metropolitan Area Network



CONCLUSION

1. The study of types of the information society should influence the methodology of application systems design, since each type will have its own requirements that are appropriate for a given level of the society's information maturity.
2. As nations build their presence in the global economy, they need a national information policy to allocate and coordinate organizational responsibilities. This policy should include direct governmental involvement in developing an information infrastructure similar to urban and rural infrastructures. Some indirect incentives for the development and modernization of the information infrastructure should be provided too. A regulatory environment should be established to provide more conducive decisions on the modernization of the information infrastructure. A case of Poland can help in solving this issue.
3. The information societies should emerge as a neutral tool of social development. They should not support any politics either liberal or conservative. They should close the loop of man-to-information and information-to-man. Their mission is the present and future of humankind equipped with the ability and tools of information and communication processing and handling. This may lead to more aware social decisions and actions.