

(enterprise networking). A key success factor to enterprise-wide computing is the architectural planning of telematic technology components as tools supporting a business strategy. Architectures of information and communications across multiple tiers of the enterprise are vital. These architectures should provide information and communication across the enterprise, much as a utility provides electricity.

*Online government* is the empowerment of citizens in participatory governing of public affairs. A strong internetworking among citizens and electronic public records is based on a graphic user interface (GUI), which supports a menu-driven, user-friendly interactive access. Government workers and officials have to learn and exercise power sharing in order to democratize equal access to power and seek service satisfaction by customers. Electronic town meetings can be one example of online government; this is an introduction of customer online scope-feedback into the governmental modus operandi. In this type of government, the citizens have easy, interactive, online access to governmental units and services. The supportive information systems are in electronic format. The electronic global citizen is a person who has telematic skills to work in/with virtual enterprise, online government, and virtual schools/universities. This person may telecommute to work or school and still be a productive worker or student. People are EGCs when as consumers they have mediated access to information about goods, services, and processes (e.g., working, learning, governing) from around the world.

All those organizations and systems are supported by information infrastructures.

## **INFORMATION INFRASTRUCTURE**

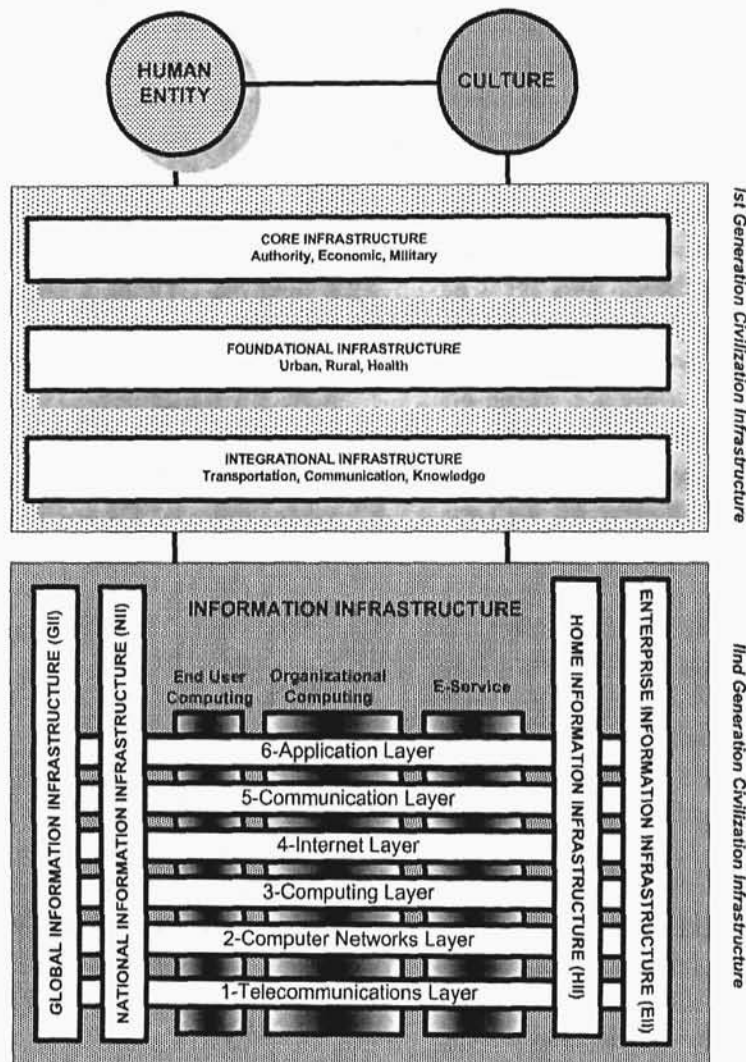
The information infrastructure is the second-generation civilization infrastructure. The first

generation of the civilization infrastructure is the set of core, foundational and integrational infrastructures as it is shown in Figure 13-4. As the latter deteriorates through the processes of the material civilization, the soft information infrastructure compensates for the losses of the urban, rural, and transportation infrastructures.

The basic components of civilization information infrastructure are being developed in the following layers (Figure 13-4):

1. Telecommunication Layer – provides services in the scope of:
  - Access and transmission technology via telephony, cable TV, satellites, and wireless
  - Switching and networking technology via local (LATA) and long-distance transmissions (IXC, e.g., ATT, Sprint, WorldCom) as narrow or broad-band service sending information through packet- or circuit-switching networks
2. Computer Networks Layer – contains end-users and organizational networks such as HAN (Home Area Network), LAN (Local Area Network), MAN (Metropolitan Area Network), RAN (Rural Area Network), WAN (Wide Area Network), GAN (Global Area Network), which are implemented on the telecommunication networks, with the exceptions of HAN and LAN
3. Internet Layer – provides global services of information-communication systems
4. Computing Layer – contains computer servers, computer terminals, operating systems, utility software, database management software, programming languages, computer-aided software engineering (CASE), and so forth
5. Communication Layer – secures such services as e-mail, EDI (electronic data interchange) e-conferencing, teleconferencing, telecommuting, groupware for team

Figure 13-4. Civilization information infrastructure architecture



- collaboration, and so forth
6. Application Layer – provides software for such applications as Office Automation (word processing, spreadsheet, micro-database, presentation, Web-navigation, automated calendaring, etc.), enterprise information systems, e-business.

The civilization information infrastructure can be divided into the following major categories:

- Enterprise Information Infrastructure (EII), (Targowski, 2001) shown in Figure 13-5
- National Information Infrastructure (NII), (Huth & Gould, 1993; Targowski, 1996) shown in Figure 13-6
- Local Information Infrastructure (LII), (Targowski, 1996) shown in Figure 13-7
- Global Information Infrastructure (GII), (Targowski, 1996) shown in Figure 13-8
- Home Information Infrastructure (HII), (Targowski, 1990) shown in Figure 13-9

Figure 13-5. Enterprise information infrastructure architecture (MIS-Management Information System, CRM-Customer Relations Manager, SCM-Supply Chain Management, EPM-Enterprise Performance Management, CAD-Computer-aided Design, CAM-Computer-aided Manufacturing, EIP-Enterprise Information Portal)

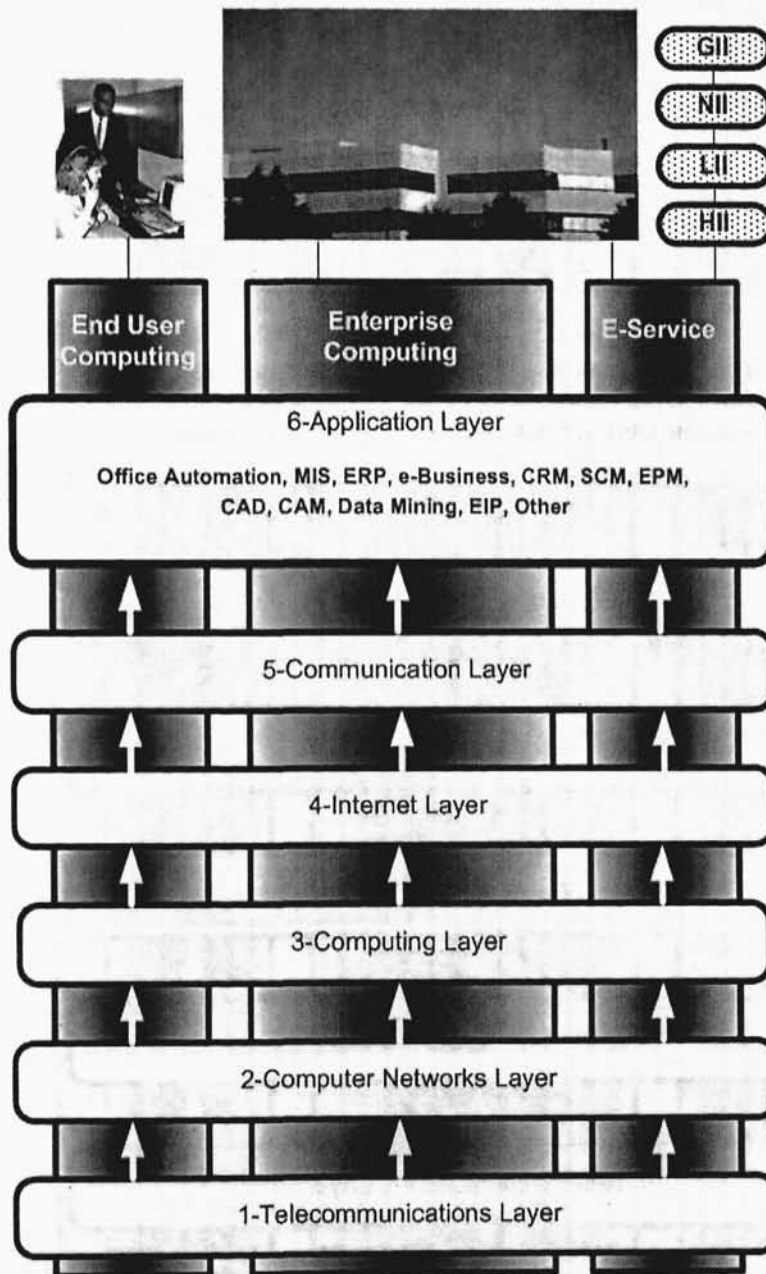


Figure 13-6. National information infrastructure architecture (MIS-Management Information System, OIP-Organization Information Portal)

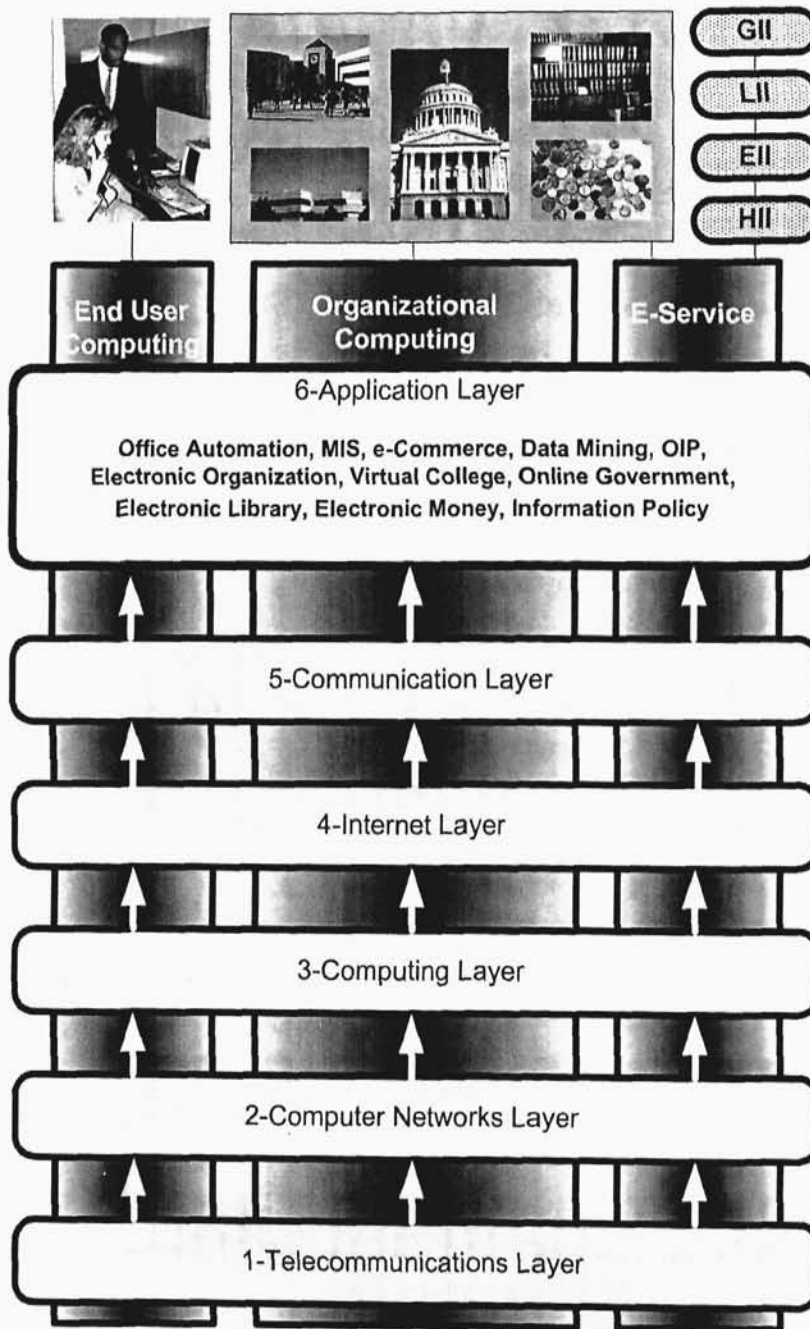


Figure 13-7. Local information infrastructure architecture (MIS-Management Information System, OIP-Organization Information Portal)

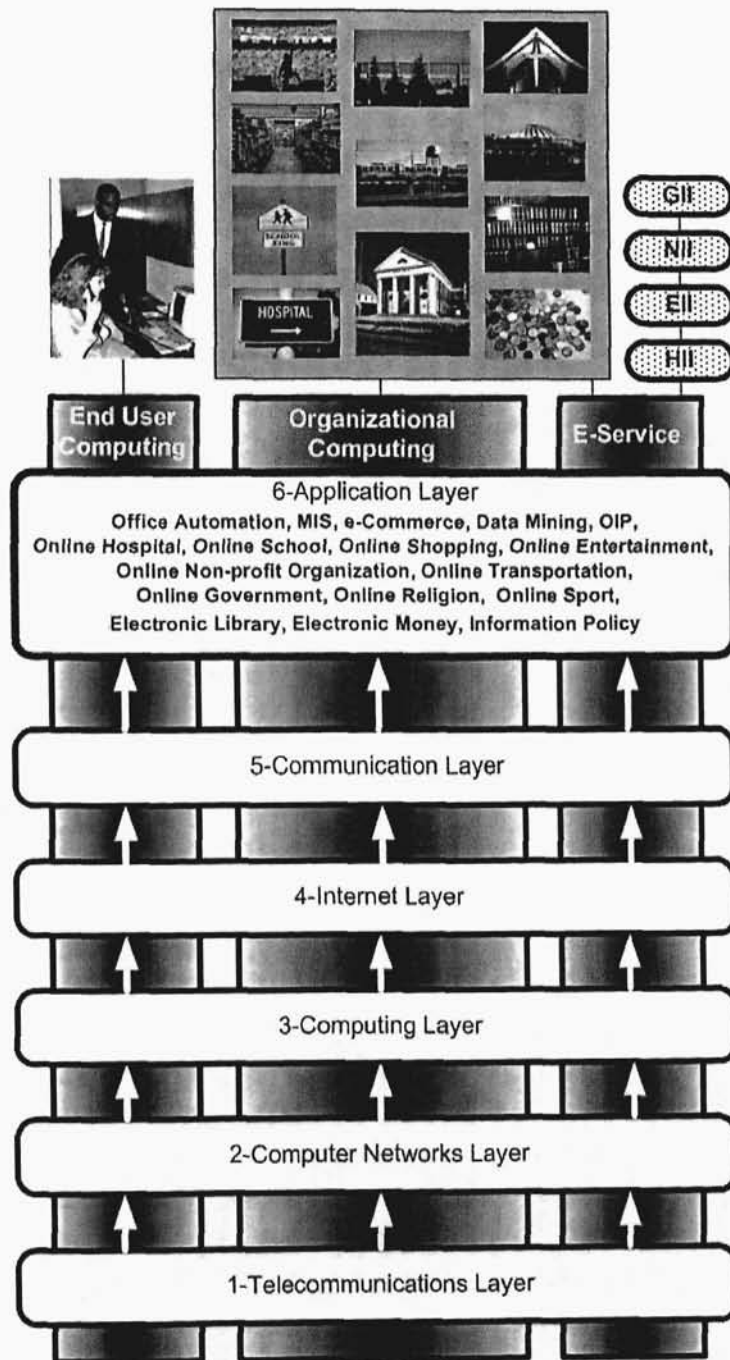


Figure 13-8. Global information infrastructure architecture (MIS-Management Information System, EIP-Enterprise Information Portal)

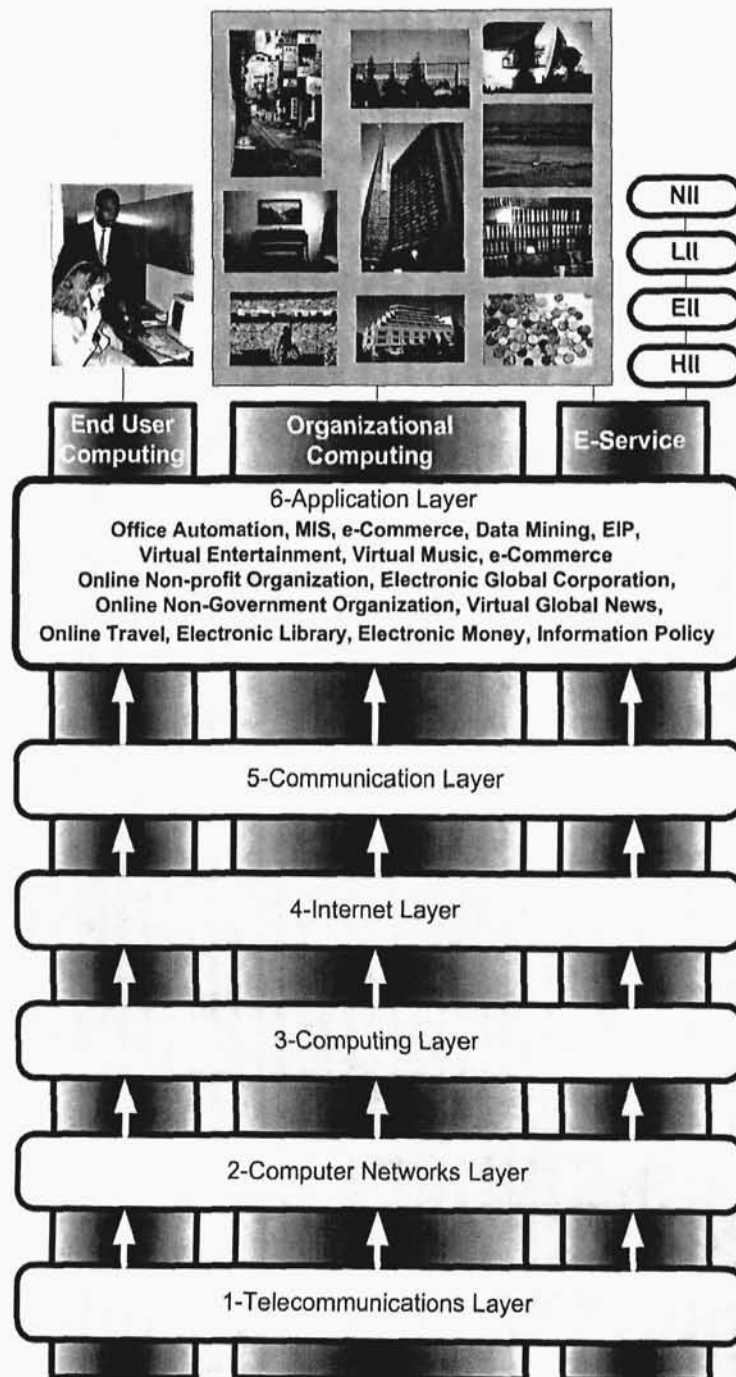
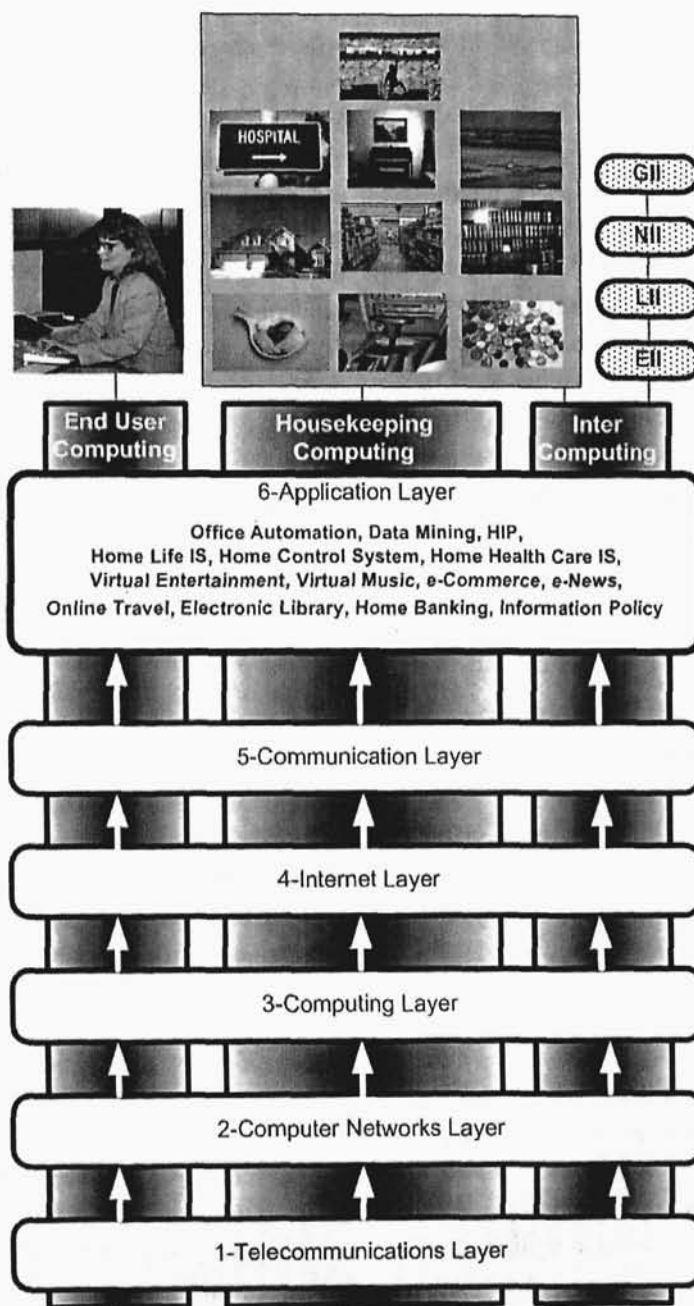


Figure 13-9. Home information infrastructure architecture (IS-Information System, HIP-Home Information Portal)





Each of these infrastructures comprise components that are specific for them and are differentiated in the application layer of each category.

Also, each infrastructure is engaged in the three types of interactive computing:

- End-user computing either at home or at work – applying mostly office automation software
- Enterprise (organizational or housekeeping) computing – applying mostly enterprise information systems such as management information system, data mining, and so forth
- Inter-Computing in cases of inter-organizational information-communication systems such as e-commerce (B2B, B2C), SCM-supply chain management, and so forth that cross borders of different information infrastructures.

## GLOBAL ECONOMY

In the 1990s, the economies of the triad of the United States, Europe, and the Pacific-rim countries became so powerful that they have swallowed most consumers and corporations. They made national borders almost disappear and pushed bureaucrats, politicians, and the military toward the status of declining industries (Ohmae, 1990). The global economy is based on the rapid dispersion of technology, the explosive growth of foreign exchanges, and the cumulative and relentless flow of mediated information and communications. The global economy can function well since it is supported by rapid logistic transportation and powerful information systems and communications networks. These latter telematic technologies make “distance” an obsolete term. The global economy accelerates the progress of technology, and technology advances the proficiency of the global economy<sup>1</sup>.

## GLOBAL SOCIETY

The global economy leads towards the gradual rise of the *global society*, whose mission will be the regulation of global economic transactions (the global market) as the national society regulates the national economy. At present, the *global society* remains mainly a subject of academic and political discussions and anti-globalism activities. Perhaps the *global society* will be a community of *electronic global citizens*.

## GLOBAL CULTURE

Global culture spreads out through cross-culture communication<sup>2</sup>, which helps in understanding a message passing the invisible borders of the EGV. The purpose of cross-cultural communication is to develop rules, strategies, objectives, and techniques for the better understanding of communications among members of the Western, Eastern, Hindu, Islamic, Buddhist, Chinese, Japanese, and African civilizations. These members are either consumers or product/services providers in the global economy. The global economy creates new challenges for cross-culture communications and vice versa. The development of EGV leads to the emergence of global culture. The global culture is a patterned way of behaving under global conditions and processes, sustaining the exchange and flow of goods, people, information, knowledge, and images. These exchanges and flows of people, logistics, and minds give rise to communication processes that gain some autonomy on the global level. Hence, there may be emerging sets of a “third culture” which themselves are conduits for all sorts of diverse cultural flows that cannot be merely understood as the product of bilateral exchanges between nation-states (Featherstone, 1990). Trade, travel, and television lay the groundwork for the global culture. In 1990, 1 billion passengers flew the world’s airways. By the year



2010, it will be 2+ billion passengers. In food, fashion, and fun, one can afford to be open to all sorts of foreign influences. In Times Square, on the Ginza, and on the Champs-Elysees sushi bars, croissant shops, and McDonald's compete for the same customers and expensive real estate (Nashbitt & Aburdene, 1990).

## **ELECTRONIC CULTURE**

The term "electronic culture" means the *electronization* of the "information culture" which has been rapidly developing since the invention of print in 1454. In the last 500 years, information culture was developed by such media as print, telegraph, telephone, telecommunications, recorded sound (wire, tapes, records and CDs), movies, radio, television, and so forth. In the last 50 years, new media such as computers (software) and the Internet have electronized information culture.

In general, information culture has been under development ever since people could communicate symbols, but this accelerated when books could be printed in the 15<sup>th</sup> century and information could be communicated over "wires" in the 19<sup>th</sup> century. The 21<sup>st</sup> century is the century of information machines, which increased our desire for better control and cognition. This, however, differs among particular civilizations and also among different levels of people's income. A more open flow of information and its better use lead toward more open and democratic societies, as is indicated by the fall of the Soviet Union in 1991, after a policy of "openness" was introduced by M. Gorbachev. The readership of underground publications exceeded the readership of official news in Poland in the 1980s, which led to the rise of the free union solidarity and fall of the Berlin Wall in 1989.

Electronic information culture is not only about electric transmission of words and images or pushing down messages via mass media ("mass

communication"); it also invites "to enlarge the human conversation by comprehending what others are saying" (Carey, 1992). Carey noticed also that "citizens now suffer in many areas from overloads of communication and overdoses of participation." Therefore, in the new electronic world, we should be able to focus on meaningful communication and important issues. Otherwise, the newly created information chaos will make us deaf, blind, and insensitive.

The electronic information process triggered new values such as: connected-expected feedback, rhythm, productivity, velocity, impatience, techno-ism, cyber-ethics, informed optimization, big picture versus small picture, global awareness, self-consciousness, and so forth. The physical world is being affected by new ways of computer-aided development and creation/implementation of such technologies as e-communication, distance learning, e-office, telecommuting, e-knowledge, artificial intelligence, e-capital, e-commerce, precision farming, mass customization, precision targeting, information warfare, net entertainment, e-art, cyber-dating, and cyber-crime. Of course, such a huge infusion of new e-technologies also generates among people (net-citizens) new "electronic behavior" identified by such attributes as a net-centric anytime, anywhere approach, the "death of distance," direct (no middleman) contacts, more intense curiosity and discovery, cyber-elitism, the digital divide, information wealth, poverty of attention, and so forth. These attributes create so-called *digital capital*, which according to Tapscott, Ticoll, and Lowy (2000) is a set of new rules of engagement in the new economy.

Electronic culture defines an e-mindsphere, e-global consciousness, and eventually the global-universal society, which acts in its e-borderless world, mostly in a cyberspace but by the nature of "*click and brick*" in the physical world, too. Figure 13-10 illustrates components and relationships of electronic culture.

Figure 13-10. Electronic culture architecture

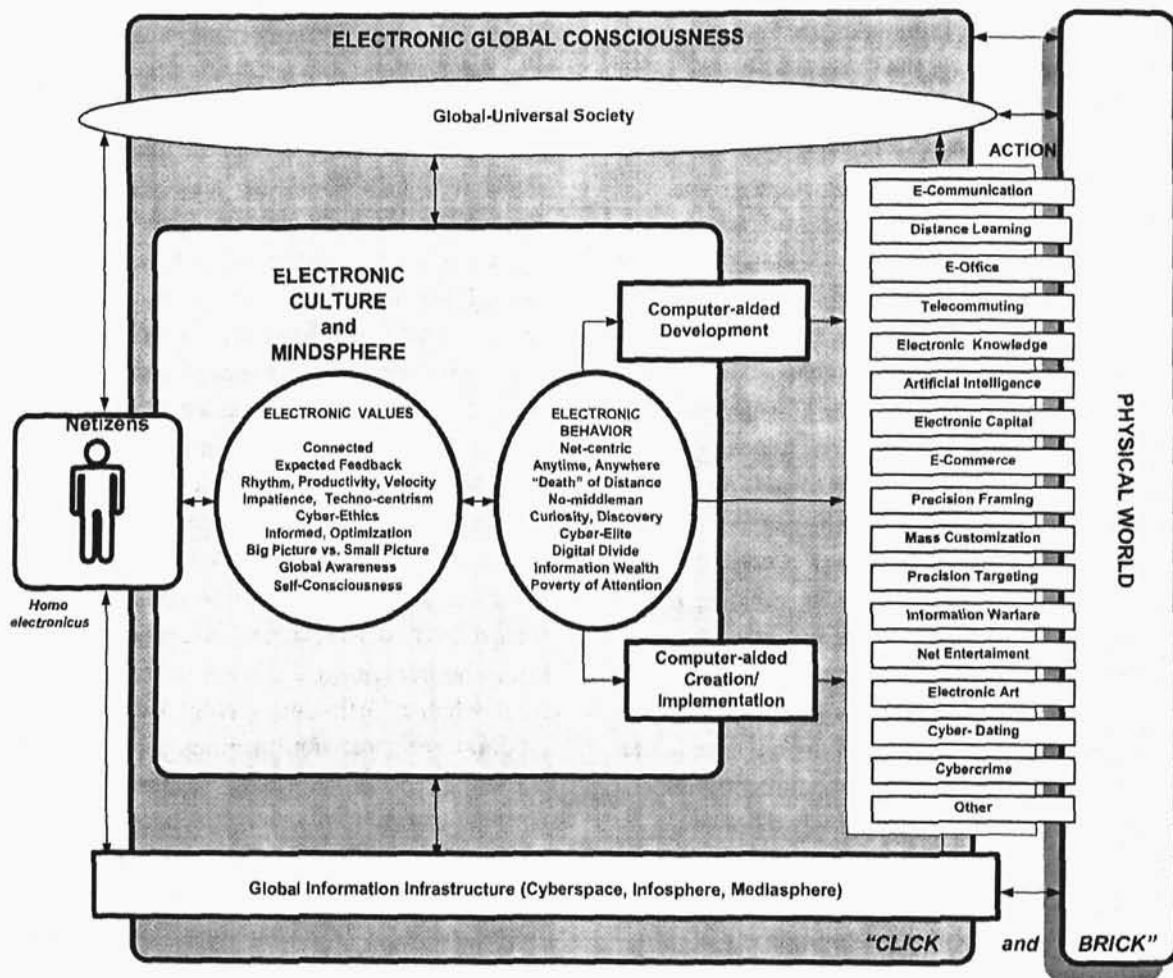
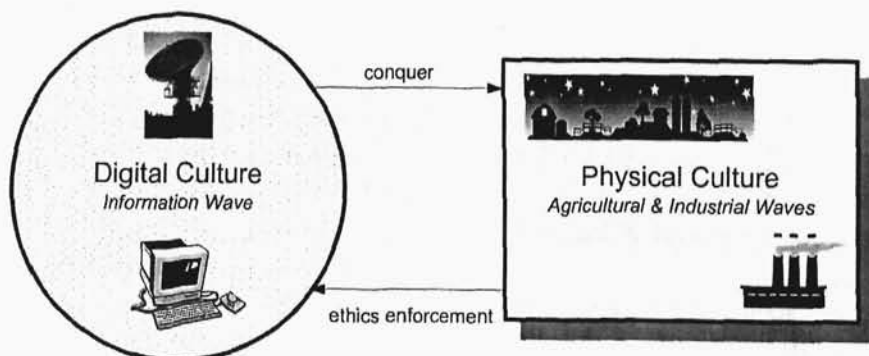


Figure 13-11. The relationship between digital and physical cultures



Electronic culture shapes or rather conquers the development and operations of information culture, which in consequence shapes the Agricultural and Industrial Waves of civilization, as is depicted in Figure 13-11.

These latter waves defend themselves by enforcing e-culture to comply with old-fashioned social ethics tested through centuries in society. Electronic culture is a culture which likes velocity, accessibility, and non-stop novelty. It is a culture which likes control and cognition and promotes democracy through free speech and net-driven equality.

### **ELECTRONIC GLOBAL CITIZEN (EGC)**

At the beginning of the 21<sup>st</sup> century, e-culture remains a culture of white-middle class males with corporate backgrounds who can navigate electronically or physically around the globe in a search for better opportunities and solutions for an increasingly frictionless capitalism. However, the high school kids, the twenties or in general, the younger generation is also net-centered. This kind of person is a net-citizen with e-global consciousness who can skillfully apply tools of the global information infrastructure. In effect, the *electronic global citizen* is a citizen of the *Electronic Global Village*, who is certainly an enlightened person, ready for dialogue and to share his vision and opportunities with others, respecting their diversity, seeing the planet from above as one world, one civilization and wanting to learn about it to protect it as long as possible. Perhaps the *EGC* is ready to accept the universal values within a framework of diversity. As a result of it, perhaps the *EGC* will minimize the *digital divide* and make e-globe accessible for all who want to be on it.

Of course this "rosy" picture is full of unexpected negative motives and actions triggered

by computer hackers, criminals, and anti-social agents. The new e-world has the same or even more intensified crimes as the physical world; therefore, it is not yet a paradise or utopia. Rather, it is some hope for a better, hopefully wiser control and cognition, applied by humans in their quest for the survival in the present settings of the universe.

### **CONCLUSION**

The development of the *EGV* can help unleash a social revolution that will change forever the way people live, work, and interact with each other.

- People could live almost anywhere they wish, without foregoing opportunities for useful and fulfilling employment, by "telecommuting" to their offices through an information highway.
- The best schools, teachers, and courses would be available to all students, without regard to geography, distance, resources, or disability.
- Services that improve a nation's healthcare system and respond to other important social needs could be available online, without waiting in line, when and where you need them.
- Freedom and better quality of life will be more popular in the world.
- Application of control and cognition will be wiser and eventually leading to longer lasting civilization.

Also, the *EGV* creates information highways that require rules of the road. These rules are being created along with these practical applications. The *EGV* supports globalism and at the same time it supports regionalism, which organizes local resources to survive and flourish in global cooperation and competition.



#### A. Further Research Directions

- Investigate the relationships among the *global universal society*, *global digital consciousness*, and global economy in the 21<sup>st</sup> century and in the future.
- Investigate the relationships within the *global digital consciousness* among such components as cyberspace, infosphere, mindsphere, and mediasphere.
- Investigate the development of the enterprise information infrastructure in the scope of relationships among end user, enterprise, and service computing, particularly these last two pillars of enterprise infrastructure, which will define the emerging trend of the 21<sup>st</sup> century.

#### B. Research Opportunities

- The research opportunity is in investigating emerging electronic culture, which leads towards the emergence of electronic global citizenships.

#### C. Additional Ideas

- The emergence of electronic culture and citizenships will perhaps lead to a new bifurcation of human race.

#### D. Rationale

- Global village is a term coined by Wyndham Lewis in his book *America and Cosmic Man* (1948). However, Herbert Marshall McLuhan also wrote about this term in his book *The Gutenberg Galaxy: The Making of Typographic Man* (1962). His book describes how electronic mass media collapse space and time barriers in human communication, enabling people to interact and live on a global scale. In this sense, the globe has been turned into a village by the electronic

mass media. Today, the term *Electronic Global Village* is mostly used as a metaphor to describe the Internet and World Wide Web. This new reality has implications for forming new sociological structures within the context of civilization. The Gutenberg Galaxy phase of Western civilization is being replaced by computer networks and electronic information-communication, leading to "electronic interdependence." In this phase, electronic media replace the visual culture of the Gutenberg phase, producing cognitive shifts and new social organizations based on digital media technologies. As a result of this shift in technology and media, humankind is moving from the individualism and fragmentation that characterized the Gutenberg Galaxy to a collective identity, with a "tribal base" within the *Electronic Global Village*. Instead of tending towards a vast Alexandrian library, the world has become an electronic brain, with the *global digital consciousness* and ability to pursue problem-solving through a world-wide forum, creating a new concept of digital world community acting in a planetary cyberspace. Therefore, it is important to investigate electronic/digital components of that new "brain," "consciousness," "culture," and "civilization." Perhaps we are facing a new civilization bifurcation of mankind.

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## ENDNOTES

<sup>1</sup> More on global economy is provided in Chapter VII.

<sup>2</sup> More on cross-culture is provided in Chapter XV.