

Understanding e-Society by E, D and V

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ABSTRACT

E-society is understood from three versions, i.e. E-version for electronic, D-version for digital and V-version for virtual. All three can be used as prefix. With using them as prefix, it's difficult to define prefix based concepts like e-society, digital earth and virtual world. With regarding them as E-version, D-version and V-version, they entail different influences of information and telecommunication technologies on the society. E version is not limited in the meaning of electronic, but also in empowerment, enhancement, and effectiveness; V-version in vision, virtualization, visibility, value; and D-Version in digital, digitalization, development, design etc. Three versions are interrelated to each other and reflect progresses not only in technologies and but also in applications for our work and life. After listing selected terms under each of three versions, it has been found that some terms in the categories of these versions are interchangeable, some are not. In general, E as a prefix can be placed before terminology of subjects and objects alike, whereas the D and V suit technology alike. The discussion aims at a better understanding of e-society and exploring new directions and applications based on such an understanding.

KEYWORDS

E-society, digital, virtual reality, development, information technology.

1. INTRODUCTION

E stands for electronic, D for digital and V for virtual. We would rather define the appearance of E, D and V as a phenomenon in e-society that takes place in a way where everyone can see objects and do things in a virtual world against a physical one; where everything is converted into digital formats and saved for use/reuse and represented in a virtual way; where everywhere is connected to a world wide web and any information, knowledge and services can be accessed by anyone, anywhere and anytime through any kind of devices.

All three can be used by its own or as a prefix. With the prefix usage, it's difficult to define prefix based concepts like e-society, digital earth and virtual world. People have widely accepted and used these concepts when they are trying to distinguish an e-society from the traditional meaning of a society and a virtual world from a real world. With regarding them as E-version, D-version and V-version to reflect different perspectives of understanding of e-society in relevant to information and telecommunication technologies, this paper is going to address following questions. What do E, D and V mean in the e-society context? What indications are embedded in these perspectives and versions for the development of e-society? How they interrelate to and differ from each other?

2. E, D AND V IN E-SOCIETY CONTEXT

Leon Cremonini et al. (2001), define e-society as a one where the social structures (e.g. families) maximize possible advantages of the new Information Society, where information is a key component of economic and social activity, but involves rapid, broad and deep access to and exchange of information among all elements of society. Building e-society is to establish relationships between public agencies and other institutions – other public agencies, private sector service providers, non-profit and community organizations – and with the relationship between civil society institutions.

In an e-Society program (Hägglund, 2001), they study and develop new IT-based services in the society from a human-centered perspective (consumer, citizen and user), with an emphasis on electronic commerce, home services for the citizen, electronic media and publishing, and public sector services, all with a special concern for small and medium-sized enterprises. As information communications technology is transforming our global society in the most profound ways ever experienced in the history of human beings, the accelerating convergence between telecommunications, broadcasting multimedia and information and communication technologies is driving new products and services, as well as ways of conducting business and commerce.

E-society has a very wide spectrum in terms of technology and application. Many things we used to have and to do manually before have been replaced in electronic manners. Today, we could borrow digital formatted “books” (e-book) for research needs anywhere and anytime from an electronic connection to a digital library instead of paper formatted books from a physical library. We can visit a gallery from a web site guided by a virtual tour instead of being there. We would prefer to manage our private banking transactions via an electronic connected net banking system by our own at home instead of going to the bank and asking bank clerks for help. Such examples can be illustrated in a long list. All of these new things happened to our professional and everyday life have given us an online life and new ways to work and to live. Both enterprises and individuals are led to a virtual environment from which they gain online businesses and lives as one of common characters in modern online life.

Some areas and existing concepts are listed in Table 1. These terms are selected from conference topics of IADIS e-society 2004 (IADIS, 2004) and DigitalEarth03 (ISDE, 2003), Computing Dictionary (Howe, 1993), JANUS terms and glossary (Cremonini et al., 2001). They are of interest for discussion and might not cover all terms in the field.

2.1 E-Version

Electronic has been used as a prefix (with or without hyphen) that has spread from e-mail to other forms of human enterprise as they emerge on the Internet. Well-known examples are e-commerce, e-business, e-book, e-government and e-learning. The sense of “electronic” in this usage generally had and has to do with telecommunications. This is the original E development in which information and telecommunication technologies are involved tightly. Now we are used to put this prefix into many things. Not only is E understood as the electronic, but also it has meanings of empowerment, extension, enhancement and effectiveness, which are further built up on the electronic.

Empowerment takes place with people at a knowledge level. People obtain knowledge first and then apply into their practice properly. Such empowerment can be regarded as “a process of adding vitality, energy, and new powerful resources to a person” (Hall and Bodenhamer 1999). For individual human beings, they could gain knowledge through e-learning at home and then utilize the knowledge into their work and everyday life. The way they learn knowledge through this electronic channel has made the life-long learning easier and more convenient and effective. For organizations, empowerment makes it possible to upgrade the performance of an organisation through greater delegation of authority to act. It encourages and enfranchises employees to make decisions and take more responsibility for their actions (Novo Nordisk, 1998). To empower a community is to increase its ability to do things for itself. It is more than just adding some communal services or facilities like roads, sanitation, water, access to education and health care. It means

increased ability and strength. It means more skills, more confidence, and more effective organization. It cannot come about by charity or donation of resources from outside (Christchurch City Council, 2004).

The enhancement and extension are mainly focused on improvement of our abilities and capacities in doing things with help from advanced technologies and intelligent devices. For instance, we take a picture for our ear, when we feel pain inside. Showing the picture taken from a TV or computer screen, we can find out what wrong is and where. Other examples can be taken from computers and applications specially created for disabled people. The machine can help those people to talk, to read and to write. People's physical abilities get expanded when the application is properly used. For ordinary people, those technologies can also enhance their ability to perform their tasks.

The effectiveness means quality of being able to bring about an effect (Webster' Dictionary, 1913). It is described as degree to which a system's features and capabilities meet the user's needs (Christchurch City Council, 2004). Advanced technology provides an opportunity for organizations and individuals to increase collaboration, reduce duplication of efforts, improve cost effectiveness and enlarge their forecasting and prediction capabilities. Therefore, organizations and individuals get enhanced in many ways to achieve their goals effectively. We save our time and efforts when we do banking transactions by our own. At present, web services (e-services) provide with widely acceptable applications that allow all people in the society to share same knowledge globally and effectively and offer organizations competitive advantages in a global economy.

Therefore, the role of IT can be regarded as an enabler of broad-based social and economic development. As found in the study of Accenture et al. (2001). Two non-mutually exclusive approaches can be pursued to carry out this strategy. The first is deploying IT to improve positioning in the global economy. The second is using IT to directly target the full range of development objectives.

2.2 D-Version

D for digital is defined as “a description of data which is stored or transmitted as a sequence of discrete symbols from a finite set, most commonly this means binary data represented using electronic or electromagnetic signals” (Howe, 1993). Briefly, the digital describes electronic technology that enables transmitted or stored data to be expressed as a string of 0's and 1's and to get over limitation of analogy technology prior to digital technology. The digital technology is primarily used with new physical communications media, such as satellite and fiber optic transmission.

With our society stepping into an information or knowledge based society, advances in science and technology impel digitalization at a great speed, enabling us to capture a wide variety of information, to create a processing model of phenomena and to simulate carious models from microscopic human body structures to macroscopic climate change on a global and regional scale. As a result, our understanding and expression of this world has dramatically changed. Much of what used to be abstracted as infinitely large or infinitely small is no longer considered as such. International information society and G8 Global information society, national information society programmes have in general include wide scopes and themes of e-society at international, regional, and national levels. This indicates a trend in using digital technology to build up an e-society at different levels nationwide and worldwide.

For different sectors in our society, digitalization has become a necessary step to further develop applications to common problems and needs. As well known, global warming as en environmental problem is facing to every country because of rapid economy development globally. We can no longer consider the environment as a local problem nor can we ignore the scope of human activities or their speed of expansion as negligible. Think globally and act locally has been expected and accepted as a way to solving such problems. Digital earth is one of attempts to know the Earth better and then contributes better resolutions to global problems.

The digital earth vision incorporates a computerized earth as its interface, whereby a corresponding virtual body of knowledge, or global encyclopaedia of the real Earth and its digital representation for understanding

the oneness of the Earth and its relevant phenomena. Digital earth has corresponding theoretical, technological, science, engineering systems, all fully integrated enabling the support of national and international cooperation initiatives for sustainable development and also focusing on economic construction and social welfare. The society will promote the exchange of information, science, technological innovation, education and international collaboration on the digital Earth vision. The digital earth is a new way to show the seamless visualization of information ranging from the global to the local level, in which "global citizens" and "global society" will become true. In this respect, digital earth provides a virtual representation of our earth including our society using virtualization technology.

On the other hand, digital libraries provide global services with all available knowledge created in human history. Such knowledge management and sharing is indeed needed to satisfy requirements for information and knowledge. Information globalization realized by information and communication technologies will result in a kind of driving force which compels our society to move on e-society regarding less the boundaries between countries. Eventually, the technical development has widened the possibilities and the efficiency in methods within the development of e-society to increase the importance of information and knowledge and drive the further development of the society. Information and communication technologies could be applied as such driving force.

2.3 V-Version

The concept "Virtual" derives from the Latin "vir" ("man" in an idealized sense), from which developed the Latin "virtus" (strength, manliness, virtue). In Middle English, the adjective meant "possessed of certain physical virtues." By modern times, it had come to mean, as defined in Webster's dictionary (1913), "being in essence or effect but not in fact." In general, virtual means the quality of affecting something without actually being that something. In e-society, there seems to be a virtual version of (virtually) everything as exemplified from the real world. It seems what we have in the real world can be found in a virtual world using powerful information and telecommunication technologies.

What can we obtain from the creation of such a virtual reality¹ developed so far from the listing of examples in the column of V-version in Table 1?

First, we could see past, current and future visions of the development in our society. Visioning is to see in a vision; to dream. A dream, according to Webster's dictionary (1913) is a visionary scheme. ITC and its development have given us a huge space for dreaming and showing the future from current reality. We can trace back the past vision, look at the current vision and predict the future vision via well designed monitoring systems. Such a virtual reality has become not only part of our life but also a basis to dream about the future. However, setting up ICT as strategy development for the society is more scientific than dreaming.

One old Chinese proverb tells the same story. The proverb says that intelligent people know everything without going out home because they knew more than what other people knew. Therefore, people dreamed to become intelligent ones in the old time when only a small amount population could be educated in private schools. In today's analysis, the secret for intelligent people being smart and knowledgeable is just because they got education to be able to read and then to apply their knowledge to predict things to come. As a matter of fact, it is the education that makes people intelligent. This is nothing new in e-society in which education system is well established for all people and everyone has chances to be knowledgeable and intelligent. Moreover, a virtual learning environment like e-learning is available for people to gain knowledge. Also, people could know things via different channels such as radio, TV and broadcasting, as well Internet to know happenings worldwide.

Second, a virtual world conducts values. Value can be understood property or aggregate properties of a thing by which it is rendered useful or desirable, or the degree of such property or sum of properties; worth; excellence; utility; importance (Webster's dictionary, 1913). Nowadays, we can easily gain knowledge and

¹ Virtual reality is about computer simulations that use 3D graphics and devices such as the data glove to allow the user to interact with the simulation (Howe, D. 1993).

information from any kind of connection either a virtual classroom or a virtual information center. From utilizing those knowledge and information, individuals and organizations gain the competition capabilities and resolve problems they are facing.

Third, a virtual reality offers both invisible and visible things visible. Visibility can be dedicated to describe phenomena brought from a virtual world. In the real world we see only what can be seen like a mountain and a house due to our limited seeing ability. The virtual reality extends human abilities to see what could not be seen before. For instances, we control the usage of electricity of our summer house situated either in the mountain or on the beach. A business man turns off the home oven from an airport (a remote site) after he left home in a hurry. A patient sends his/her blood pressure to the doctor via a wireless device and gets medical treatment on demand. The biggest advantage of such kind of visibility lies in that we control what we don't see. This visibility makes the virtual world even more interesting for people than the real world. With available technical and tool supports, what we can get is always what we can see and vice versa. This increases people's control power over both visible and invisible things locally and remotely.

The virtual reality has offered more value-added services to enhance and increase human beings ability, whereas virtualization technology has provided the technology to realize such a virtual reality. Virtualization technology will be applied as a key infrastructure technology to enable next stage of computing. More description on importance of the virtualization technology can be found in (HP, 2003).

The meaning of the V-version has been developed beyond the virtual reality itself. It has provided us more than another virtual world, but also visions from a real world development, values for being virtualized and some visibility for being able to see invisible things, and great milestones achieved ever in human's history. Therefore, e-society comprises those necessary elements the vision, value, and visibility all together as a whole.

3. CONCLUSION

E version is not limited in the meaning of electronic, but also in empowerment, enhancement, and effectiveness etc. So are D and V versions. Figure 1 shows different meanings discussed above. E version is regarded as basic understandings of e-society. D and V versions follow after the E version with more meanings added in.

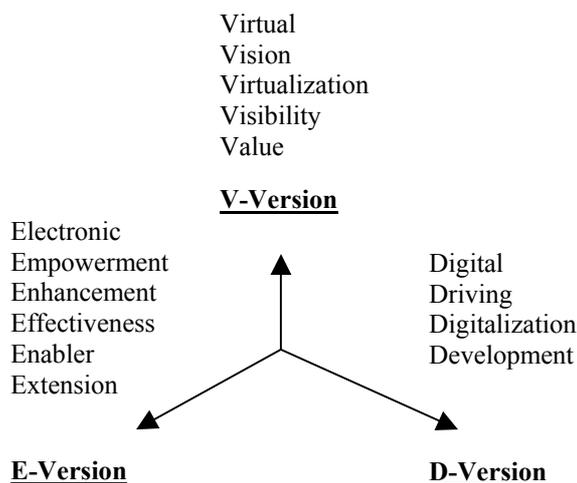


Figure 1. Overview of E, D and V Versions

Three versions are interrelated to each other and reflect progresses not only in technologies and but also in application areas by having more impacts on our work and life. We would rather argue that the development of information and communication technologies as one of the biggest event after the creation of electricity. It provides with great opportunities and possibilities for information and knowledge distribution worldwide. The information and knowledge are important resources for the further development of our society.

Table 1 gives an overview of e-society under E, D and V versions. Some terms cross difference versions are interchangeable, some are not. For instance, e-book can be replaced by virtual-book, virtual-library by digital-library, and e-city by digital-city. It is rarely seen that e-science for virtual-science, e-healthcare for digital care. This indicates that the terms are adopted closer to our knowledge classification. In general, E as a prefix can be placed before terminology of subjects and objects than what the D and V do. Possible reasons for this can be two folds. One is that E comes into use earlier than the other two. The other one is that V and D are more technology-oriented, i.e. the digital technology and virtualization technology. Virtual memory system and Virtual server are given as examples. However, it matters whether the term suits in the context or not. The implication of the discussion here lies in better understandings of e-society and exploring new directions and applications based on such understandings.

Table 1. Listing of Different Versions of e-Society

Application area	C-Version	D-Version	V-Version
Society, Organization and Community	e-Society e-Community e-Organization e-SMEs e-Collaboration	Virtual world Virtual country (V-Norway) Virtual city (V-Oslo) Virtual reality Virtual communities Virtual organisations Virtual enterprises Virtual center Virtual call center Virtual teams Virtual collaboration	Digital Earth Digital Regions Digital Europa Digital Norway Digital city (Digital Oslo) Digital community Digital journalist
Home	e-Home	Virtual home	Digital Home
Publication, Library	e-Publishing e-Magazine e-Paper e-Copy	Virtual library	Digital library Digital content Digital dissertations Digital copyright
Education and Learning	e-Education e-Learning	Virtual university Virtual college Virtual school Virtual class/classroom/lab Virtual learning environment Virtual Training Suite Virtual teacher	
Culture and Entertainment	e-Cultures e-Ticket	Virtual tour Virtual guide Virtual trip Virtual festival Virtual florist Virtual museum Virtual park Virtual zoo	Digital cinema Digital arts Digital storytelling Digital entertainment Digital culture

Economy, Business and Commerce	e-Economy e-Business e-Commerce e-Marketplaces e-Marketing e-Consumers e-Pay(ment) e-buy e-Business models		
Government and Democracy	e-Government e-Parliament e-Demoncracy e-Participation e-Voting		Digital identity Digital rights
IT	e-Carrier system e-Process Design e-Outsourcing e-Signature e-Form e-Mail e-Services e-Commerce hosting	Virtual instrument file Virtual memory system Virtual server, Virtual CD, Virtual drive Virtual printer Virtual tape Virtual storage portal Virtual host Virtual device driver Virtual machine Virtual area network/LAN Virtual archive Virtual card	Digital archive Digital divide Digital websites Digital certificate
Health care	e-Healthcare e-journal	Virtual hospital Virtual doctor Virtual body	
Others	e-Strategy	Virtual agent Virtual farm	Digital defense Digital plagiarism

REFERENCES

- Accenture, Markle Foundation, United Nations Development Programme, 2001, Creating a Development Dynamic, <http://www.opt-init.org/framework/pages/contents.html>
- Christchurch City Council, 2004, *Community Policy and Policy Guidelines*, <http://www.ccc.govt.nz/publications/communitypolicy/>
- Cremonini, Leon et al., 2001, *Initial Glossary of Terms and Definitions* (Joint Analytical Network for Using Socio-economic research), http://www.janus-eu.org/temp_info/glossary.htm
- Hall, L. Michael and Bodenhamer, Bobby G. 1999, *Glossary of Terms*, <http://www.neurosemantics.com/Articles/Glossary.htm>
- Howe, D. 1993, *Computing Dictionary* <http://www.nightflight.com/foldoc-bin/foldoc.cgi?Digital>
- HP, 2003 *Computing without boundaries or constraints Enabling an adaptive enterprise*, ftp://ftp.hp.com/pub/enterprise/Virtualization_5-5-03.pdf

- Hägglund, Anna 2001, *e-Society: Electronic Markets and Public Services*
<http://www.santaanna.se/projectbriefs/e-Soc-brief.pdf>
- IADIS, 2004, ***IADIS International Conference e-Society 2004***, <http://www.iadis.org/es2004/cfp.asp>
- ISDE, 2003, *Information Resources for Global Sustainability: Knowledge, Networks, Technology, Economy, Society, Natural and Human Resources, Policy and Strategy*, Brno, September 21-25, 2003.
- Novo Nordisk, 1998, *Health, Safety and Work Conditions*,
<http://www.novonordisk.com/reports/press/socialreports/1998/health/index.html>

