



## Study on the Construction of the Internet Ecological Concept

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### Abstract

With the quickly development of Information Technology, the Internet has produced unprecedented influences to the human society, and the new existence space and environment for human being have been formed. Aiming at the serious social problems existing in the development of the Internet, “the Internet ecological crisis”, this article utilizes the theories such as ecology, environment management and harmonious society to primarily study the new approach to lead the healthy development of network by establishing network ecology, puts forward the network development principles such as harmonic network construction, network technology ecologization and network behavior ecologization based on the concept of network ecological concept, and expatiates on the important meanings of the network ecological concept to the healthy and harmonious development of network.

**Keywords:** Internet development, Internet ecosystem, Internet management, Harmonious Internet

Nowadays, the influence of the global network-Internet to the society is increasingly extensive and profound. Free and sharing network has been human new existence space, i.e. network space. Network is changing our thinking mode, work mode, study mode and amusement mode, and it is becoming into human “second living space” or “second living environment” (Qi, 2004, P.16-22). The quality of the network environment has influenced human survival and social development. “Digitization father”, Nicholas Negroponte pointed out that we had to consciously build a safe digital environment (Nicholas Negroponte, 1997, P.275). However, the Internet ecological crisis has been presented in the network environment and it has seriously harmed the healthy development of network, which have raised human extensive concerns.

### 1. Internet ecological crisis: new problem of Internet development

“Internet ecological crisis” means the social problem which seriously influences the Internet development, makes network ecology maladjusted and harm the security of the network because Internet abuse, misapply and pollute the network environment. It is mainly embodied in following aspects. First, information pollution, junk mails, network eroticism, network rumor and false network information which are seriously polluting the network environment, and they have been the social effects of pollution of the network space. Second, the security crisis of network occurs. The invasions of network virus, hacker behaviors and network crime have produced serious threats to the network security. Third, the privacy crisis of network occurs. Human behaviors in the network will leave “digital footprints” on the internet, and we are live in the network just like in our birthday suit, and our habited private space has been threatened. Fourth, information inflation and information resource deficiency exist together. The paradox that the useful information is difficult to be found and the information utilization rate is very low under great capacity of information exists on the Internet (Zhang, 2002, P.81-83). Fifth, the crisis of cultural diversity occurs. In the network of global integration, knowledge hegemony, cultural imperialism and “dominant culture” are easy to find their places, which will threaten the diversity of world culture. Just as the biological diversity is the important factor to sustain the biological balance, the cultural diversity is the key to protect the global cultural inheritance and sustain the cultural biological balance (Tang, 2000, P.15-20).

The Internet ecological crisis mainly possesses characters such as globality, virtuality and instantaneity.

(1) Globality. The largest character of Internet is to realize the communication all over the world. The network makes the “global village” become true, and if we say “we only have one earth”, so we can also say “we only have one Internet”, and the problems occurring in the Internet are global, and only the problem occurs at one point, it will affect the whole world, and it needs the global power to solve that problem. For example, to solve the information pollution, it is helpless that only one region or country strengthens the supervision. Therefore, the settlement of network environment problem depends on not only each region or country, but global communication and cooperation. In fact,

the international self-discipline organizations, agreements and criterions have begun to exert more and more important function in cleansing the network environment and harmonizing the network ecology.

(2) *Virtuality*. The network space is a digital space and virtual environment, and the problems existing in it still has the nature of virtuality. These problems are different to the natural environmental problems in the actuality, and they destroy the virtual information environment, and they belong to information damage and digital damage which are not same with virtual damage, and they are real damage which will directly or indirectly influence the society, and the influences are extensive and serious. Especially, because this sort of damage is not easy to be apperceived or checked in the damage process because of the virtuality of network, so when the damage is found, the very serious and irreversible aftereffects have occurred.

(3) *Instantaneity*. The development speed of Internet is infrequent in human history, and just as the development speed of Internet, the destroying speed of the network environment is very quick. Taking the computer virus as the example, before the Internet occurred, the diffusion of computer virus is mainly implemented by one to one manual mode in virtue of disk, and relatively speaking, the speed is slow, and routes are few and the range is narrow. But when the virus spreads in the network, it can automatically diffuse in the larger range, and induce serious aftereffects instantaneously. Only if hacker clicks the mouse, the report that there is website to be hacked will be spread right now. The virus of "love worm" which indulges in willful persecution all over the world induced billions dollars' losses to the world only in several days.

The essential of Internet ecological crisis is the intensification of the conflict between human and information, and that conflict is not the conflict crisis among individual factors, but it is the ecological crisis of the whole network system, network environment and network society. It is a systematic engineering to solve the problem undoubtedly, which not only needs the powers of administration, enterprise and individuals, but needs to strengthen the international cooperation. Not only the function of network technology but the function of law, ethic and morality should be emphasized. The settlement of network ecological crisis undoubtedly should depend on the technical advancement, the investment of capitals and the increase of bandwidth, but the facts proved that it is not enough only to solve the problem technically, and if we start from the views of ecology, ethic and sociology, we may be find the new approach to solve the problem.

## **2. Evolution of Internet ecological concept**

Ecology is the science to describe the harmonious development between human and nature, and it has been the most important world view and methodology at present. The theory and method of ecology have been extensively applied in the research about social science. The "education ecology" which was raised in 1970s analyzed the education system by the ecological opinion. US scholar Regus founded the "administration ecology", and James F Muler put forward the concept of "ecology of commerce". The network ecological concept is put forward by the author based on the origin of the relationship between human and nature. And the author thinks that with the development of the network, the network has been evolved as a sort of new "humanized nature" which is called as the "network nature" (Bai, 2006, P.1-3). Traditional network cognitions are mainly centralized in the layers such as network technology, tool and establishment, but with the development of network, the network has formed a sort of new space and environment which has evolved into the new social conformation and new human ecological system. The development of network is going from tool to application, from establishment to environment, from material to humanism, and from technology to ecology.

### *2.1 From geographical space to network space*

"US National Information Infrastructure (NII)" plan embodied a series of the geographical topics about the space relationship reform. And the plan alleged that the development of NII would change human living mode, work mode and communication mode for ever, and the future society would present the prospect of "network". This sort of "network" reminds that we have to pay attention to many new terms such as "electric space", "super space", "network space", "virtual space" and "new social space", and we have to emphasize the information communication technology (ICT) and the "geographical situations" of all participators (citizens, companies, local governments and national governments) would be changed by the technical innovation.

Traditional geographical spaces and distances exert main functions, and different places have different "values". With the occurrence of "non-geographical space", the regions are established on the based of electric network, which doesn't consider the limitations of many factors such as terrain and distance, and the high-speed transmission spanning long distance makes people can associate with any site in the world. Users can implement effective communication through the network information service, which replaces the direct contact face to face. In the non-material domain of information and data exchange, the geographical distance becomes into the instantaneous zero distance. This sort of network space essentially roots in three aspects. The first aspect is the integration of three industrial departments including computer network, telecom and TV, and various multimedia services on the Internet, which make the comprehensive transmission of voice, word, data and image possible. The second aspect is the miniaturization of new

generated terminal units such as PC, palm digital terminal and cell phone, which make the removability of information communication strengthened largely. The third aspect is that more and more organizations, units and individuals are linking with Internet in various places all over the world.

The network space is established in the interfaces of information technology and time. The network space is the “instantaneous space”, and under the organization of network, the important thing is the process to solve the problem, and it is not the place to deal with information. The communication in real society is the communication of time and space, but the network communication is the communication only under the time interface, and the space has disappeared. In the “real time”, the world is changing to be touched, and the “time control of geographical space” has become into one independent condition of globalization, and works and livings are more and more away from material and distance, and they are developing to the “fluidity in the instantaneous space” (H. Barques, 2000, P.104-111).

### *2.2 From network space to network society*

With the continual advancement of scientific technology, the human social living domain is continually extended. From the obscurity time to the civilization time, from the agricultural society to the industrial society and to the information society, the evolutive history of human society is the process that the living domain is continually away from the natural environment and the nature. Through the humanization of nature, human make the humanized nature formed continually, and the humanized nature is continually becoming into human living territory. Network is the integration of new social activity mode and survival mode produced by the development of modern information technology, and as a new humanized nature body, it has been the new social and living territory.

The network society is a sort of undeniable “new space” in human living which really exists. As human new living domain, it has new characters which are different to the living domain formed in former human society. The material base of network society is different to the traditional society, and the mediums which form the human social relationship are largely different to traditional society. The social communication view and social scene including human life feeling are largely different to the traditional society. Comparing with past daily living domain, the network society possesses relatively independence and self-maturity, and it can be the time and space existence as an independent and self-contained sub-system, and it can co-exist with past living domain, and it can also exist with past living domain together, and in this new living domain, the living resources only include information, but in the past living domain, the living resources include information and various concrete materials.

We can say that the network space has been the new living domain of human, and the network society has been the real existence of human society, and the network existence is the new life activity form for human being. But in the back of the surprising and flourishing development speed of network, just as same as the social effects of pollution in natural environment, information pollution, network virus and garbage mails have been the public pollutions in the network environment, and the network ecological crisis occurs. Why above problems will occur? How to solve above problems? How to build healthy and harmonic network? The author thinks the ecology is the good edification. When the industrial civilization swept, many problems such as environmental pollution, resource deficiency and population explosion were induced. After experiencing one by one painful lessons, human begin to treat the important problems of human survival and look for the method to solve the problem by the ecological view. Network is the survival space and environment established by the human, and facing the serious problems in the development of network, we should study the network as viewed from the ecology, and analyze and diagnose the “network ecological crisis”.

## **3. Principles of the Internet ecological concept construction**

The network environment should be healthy and harmonious, which is human consensus, but the “Internet ecological crisis” seriously harms the network and social development, and it is the objective requirement and proper selection to understand the network and scan the problems in the network development as viewed from the new domain of network ecology. So, based on traditional network technology concept, we should establish a sort of network cognition- network ecology concept, and we should establish the ecological value direction of network, and to rebuild the present network concept from the natural ecological concepts such as ecological system and environmental management and the social ecological concepts such as harmonic society and sustainable society.

### *3.1 Harmonious network*

The report of “Seventeenth National Congress of the Communist Party of China” pointed out that “building harmonious culture and foresting civilized fashion, strengthening the construction and management of network culture and building good network environment”, leading and forming the concept and lively complexion of “everyone is responsible for and share harmonic network”. To establish the harmonic society is the total principle of the present social development, so to establish the harmonic network is also the total principle of the present network development.

As one important part of modern society, the network is associating with real society all the time. The establishment of the harmonic society should achieve not only the harmony of real society, but the harmony of the network society. The network and reality should be reflected each other, and the network has irreplaceable function for the establishment of

the harmonic society.

As the extension of real society, the network society offers good experiment fields for the practice of the harmonic society by right of its characters such as opening, interaction, timely nature and extension, and at the same time, the information infusion, consensus position and expression atmosphere in the Internet also react with the establishment of the harmonic society to large extent. So, it is the necessary requirement to manage and lead the Internet for the establishment of the harmonic society. However, the obvious lag and confusion of Internet management have been the unharmonious factors in the establishment of harmonic society, and to strengthen the Internet management should be the urgent task to complete the establishment of the harmonic society.

The development of Internet has its own rules which are not isolated, and these rules should be harmonized with real society, reduce and avoid the harms to the real society, and especially in the process that the Internet develops very quickly, we have to deal with various possible problems between real society and network society. The harmonic society needs harmonic network which is the important part of the harmonic society, and the harmonic network promotes the development of the harmonic society.

### *3.2 Ecologization of network technology*

The development of network can not leave the technology, and to establish the network ecological concept, we first can not abandon the technical attributes of network. Without the technical attributes of network, it is not feasible to establish the network ecological concept. The ecologization of network technology is the principle we have to persist in to establish the network ecological concept. As the foundation of modern industrial civilization, the quick development of technology endows the industrial civilization the ability to control and conquer the nature, and endows human ability to infinitely “take” from the nature, and though human create large material fortunes because of that, but the nature is seriously destroyed, and the ecological crisis occurs. To avoid the negative effect of technology in human civilization evolution, the technology must go to the ecologization. The technical ecologization is to use the ecological ideas to instruct the research, development and application of technology, lead and standardize the technical system by the ecological law, and make the ecological technology better server for the harmonic evolution of human and nature. According to the requirement of ecological theory, we have to persist in the tenet of “technology benefits human”, implement technical research, application, development and management, take the ecologization (including natural ecology and social ecology) as the standards, fully advocate the development of network technology which accords with the ecologization, and gradually wash out the network technology which doesn't accord with the ecological development.

### *3.3 Ecologization of network behavior*

The network is supported by the technology, but human network behaviors decide the application and consequence of network technology, so we have to establish corresponding network behavior rules.

First, the “harmless rule” should be required. Any network behaviors should be harmless to others and network environment. Human should not utilize the network technology to induce direct or indirect harms to other network bodies and network space, which is the ecological base line of network behaviors and the basic moral standard to evaluate the network behaviors. It is very helpful to analyze the moral paradox in the domain of network technology, for example, the network virus and hacker behaviors are behaviors which seriously disobeys the harmless rule (Richard, 1999, P.54).

Second, we should persist in the “public rule”. Network is the network of all human and the network of the whole world, and it is a global ecological system. When you enjoy the Internet, you should take care of others' existence, feelings, public benefits and public orders, and you should not pollute and destroy the network environment. Network is not our own network, and it is also our unborn network, and we have to leave clean and beautiful network space for our offspring.

Third, we should persist in the “respect rule”. Network is the humanism network, and it is not the network of machine. Professor Lucas D. Inrona (2002) of British Lancaster University pointed out that the network was human itself, and it was the support of human existence (Lucas, 2002, P.220-221). Whatever the network achieves high technology and virtual effect, it is not the “place without human”, and it is the relationship network among human beings, and it is the communication space among human beings, and the main body of network is not the real human and the “virtual human” and the machine, so the network behaviors should accord with human characters and social standards and requirements. Network main bodies should respect each other, and they should not regard others as pure “digital” symbol which can be operated and computed at will. The protection of privacy is the basic behavior rule, and individual information should not be issued and diffused at will, and both the right that human control their private information and the respect that others face the private information should be emphasized, so the status of the respect rule is more important in the network. In the popular “free service” of network, service suppliers always think they have infinite and absolute rights, and they rarely consider and respect service receptors' rights, and in fact, that is the representation of

householder idea, and its abuses have been early condemned in social ethic, life ethic and medical ethic.

#### 4. Signification of the Internet ecological concept construction

The network is the space full of paradox, and the existence of paradox induce the settlement of network environment be in a dilemma. For example, should we supervise the network? If we let it along, many anarchism behaviors will run riot, and if we supervise too strictly, the essential of the network will be harmed, and the characters such as opening, freedom and sharing of network will lose, and we can not image the separatist and blanked network is still the network.

US scholar Baird (2003) (Zoe Baird, 2000, P.26-29) pointed out that the internet management was the real challenge in the future, and the internet management should be the part of the mainstream management, and it should be the management which governments, enterprises and individuals all participated in. The internet management has been the global challenge what we have to face at present. The ecology and relative theories are the most effective approaches and means to study and solve problems under the present topics of “harmonic society” and “sustainable development”, and the network has been evolved to a sort of new human ecological system from early simple technology and tool. So it is the objective requirement to establish the network ecological concept for the development and management of internet, and that is the guidance to establish harmonic and healthy network, and one important part to establish the harmonic society.

The Internet ecological concept is a sort of new network development concept, and it is the confirmation and spread of new network view under the scientific development view, the sustainable development view and harmonic society view, and it is the transformation of pattern for the network world view from “technical” pattern to the “ecological” pattern of the integration of “technology- information- society”. The network ecological concept can lead human to form overviews and ultimate opinions, i.e. the network ecological view, based on ecology. The network ecological view is a sort of new network development view in the frame of the scientific development view, and it is the enhancement and integration of original network tool view, network technology view, network information view and network society view, and it is the objective requirement and essential reflection of present network and society, and it is the necessary tendency of network and human social development, and it is one of important contents of modern ecological civilization for human society.

#### References

- Bai, Yongqing & Wang, Ziyang. (2006). The Impacts of Network Nature on Human Society. *Science Technology and Dialectics*. No.4. P.1-3.
- H. Barques & Luzi. (2000). The Change Tendency from Geographical Space to Geographical Network Space. *Acta Geographica Sinica*. No.1. P.104-111.
- Lucas D. Introna. (2002). The question concerning information technology: thinking with Heidegger on the essence of information technology. John D. Haynes. Internet management issues: a global perspective. *Idea Group Pub*. P.220-221.
- Nicholas Negroponte, interpreted by Huyong & Fan, Haiyan. (1997). *Digital Survival*. Haikou: Hainan Press. P.275.
- Qi, Aimin. (2004). The Attribute of Cyberspace as well as Its Influence on the Laws Related. *Journal of Guizhou University (Social Science)*. No.2. P.16-22.
- Richard A. Spinello. (1999). *Century Morality: the Ethic Aspect of Information Technology*. Beijing: Central Compilation & Translation Press. P.54.
- Tang, Yizhi & Lilun. (2000). The Network Ecological Crisis and Network Ecological Ethic. *Journal of Social Science of Hunan Normal University*. No.6. P.15-20.
- Zhang, Xinzhi. (2002). An Antinomy of Communication in the Internet Age. *Journal of China Agricultural University (Social Science Edition)*. No.3. P.81-83.
- Zoe Baird. (2000). Managing Network: Government, Business Circles and Non-profit Organizations. *Digest of Social Sciences*. No.3. P.26-29.