

Digital Earth: The Informationized Earth in the Knowledge Economy

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ABSTRACT This paper first introduces the social and scientific background for digital earth. The significant role of information technology in the progress of social economy formation is discussed. The author points out that the implementation of digital earth program will make the information enterprise develop rapidly, raise production rate, resolve a series of problems that are hard to resolve in the traditional economy, thus increasing the economy and making human society step into the knowledge economy era as early as possible.

KEY WORDS Digital Earth, Knowledge Economy, Informationized Society, National Information Infrastructure

When we get into the 21st century, the development of society and economy is deeply affected by science and technology with tremendous force and at high speed which is hard to image. Human is being carried into new social-economy formation --knowledge economy by the tidal waves of global informationization.

The Informationized society makes the feature of computer network with wideband and high speed which is a strong force to promote the sustainable development of society. In the knowledge economic society, it has been the main economic activities to produce, distribute, exchange and consume information. In the light of prediction, the 90 percent of the world man-powers will be engaged in the jobs related to the information technology in 2010. Moreover, the knowledge which is grasped by the human in ten years from 2011 to 2020 will be 3-4 times more than that which is grasped by the present people. All of these will promote the development of economy and alter people's social life.

The national informationization is a basis of informationized society. To built the NII(National Information Infrastructure) is a promise of national informationization. The U.S NII program was initiated by HPCCI(High Performance Computing & Communication Program Initiative) and developed based on HPCCI. The establishment of NII is able to make fully use of information resources, to promote the reorganization of industrial structure, to speed up the flow of funds and technology, to make the business internationally competitive and to provide many opportunities of employment.

After five years of proposed NII program, the "Digital Earth" speech by the U.S vice president Al Gore in 1998 attracted much attention from the politicians and scientists in many countries in the

world. The digital earth is a comprehensive key program to serve the U.S government's strategic aims. The objectives for construction of NII is to obtain the information resources by spanning regions, while the objectives of digital earth is to solve the problems of information resources(Mainly geo-spatial data) for NII. The core of digital earth is the global digitalization of the earth observation.

Because of the features of the multi-resolution, real-time, visualization, three dimension and globe's digital coverage of the earth observation, the digital earth consists of GIS (Geographical Information System)with great amount of geo-referenced information collected from different sources and GII(Globe Information Infrastructure). Digital earth is important for us to understand our planet in the 21st century and promote the development of knowledge economy.

According to western economic theory and practice, the implementation of big science and technology development programs can stimulate the increase of economy and provide the opportunities of employment. This kind of big programs is of remarkable economic and social benefits because of its lots of technical attachment products. This is one important reason for U.S governments, frequent organization of this kind of big programs. Many countries like to follow. The digital earth program is no exception.

Take the NII as an example, the U.S business created new sales of total 300 billion U.S dollars annually. According to the statistics of a U.S agency, by 2007 the NII will have made the increase of 19.4 billion dollars for GDP, 321 billions for GNP in the U.S., raised the production rate by 20%-40% and decreased 30-40 percent of the total flow of passengers by present interstate high ways. So the

social problems of energy, transportation, environment will be relaxed. Some 36-100 billion U.S. dollars for health care in the whole country of the U.S. every year can be saved because of medical care on networks and environmental improvement. The NIH itself provides thousands upon thousands of employment opportunities. The new personal telecommunication department only will create some 300 000 jobs in 10-15 years in the U.S.

As a developing country, China has not developed a complete industrial economy. In order to enter the knowledge economy era as early as possible and keep the strong competition and a sustainable development abilities in the globe market economy, we must build Chinese information infrastructure and national knowledge renovation system.

According to 1998 World Bank's annual development report, building NKI (National Knowledge Infrastructure) is an important way for developing countries to improve the knowledge renovation ability and people's quality to shorten the distance with the developed countries rapidly. This is also the basis for China to build her own digital earth. It can be put into consideration that Chinese information technology industry can develop at jumping speed and make China enter the knowledge economy society as soon as possible by planning Chinese digital earth construction.

The advanced GIS in digital earth will help resolve the conflicts which is hard to resolve in industry economy, such as the decrease of consumption for energy and resources, the protection of environment, the mitigation of natural disasters and the relaxed traffic jam etc.

The realization of digital earth will make geographical location and spatial distance unimportant in the regional development. Geographic research can overstep the limit of traditional region. The digital earth provides the best platform for research of global change and globe economic information and activity. It is no doubt that the digital earth fits in with the trends of globalization of knowledge economy in the 21st century.

The digital earth is the best way to use the existing data and information resources and to realize the sustainable development in our country. To build the digital earth is a great significant revolution of the geo-spatial information. The present high science and technology products and the great demand of the space geographical data will make the digital earth become the hot research and application point of the geo-spatial information in next century. With the unlimited business opportunities and potential big market, the digital earth will display the power and superiority of the knowledge economy for human society.

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