Analysis on future development trend of computer science and technology

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Abstract. with the continuous progress of Chinese economic society, the science and technology has presented a booming developmental trend. Computer has been widely used in different domain of social life and become an indispensable part of people's social life. This article aims at briefly introducing the historical process of computer development and evolution and the current development situation. Then it analyzes the reasons of its development and further discusses the future development trend of computer science and technology, and provide some reference for the application of computer science and technology in different domains of social life.

Introduction

Since the world first computer was produced, computer has experienced 60 years' development with significant achievement in the development cost and the volume and arithmetic speed. In today's society, scientific and technological development has changed very quickly. With the pace of people's life quickening than ever, the application of computer becomes more and more diversified in domains such as industrial production, military operation, education research, and national economy. Thus, the prediction of future development trend of computer science and technology can help to promote the development progress of socialist modernization. The author will introduce the development and evolution history and current situation of computer science and technology, explore the profound reasons of its development, and make forecast on its future development trend.

Historical evolution and current development situation of computer science and technology

Historical evolution of computer science and technology

In 1950s, the world first computer was born with the name of "ENIAC", as shown in graph 1. After 60 years' development, six scientists have made brilliant contribution to its development. In all scientists, British mathematician Alan Turing, and American mathematician Von Neumann made particular outstanding contributions. To commend Turing's contribution, people praised Turing as the father of computer. In 1945, Neumann integrated the advantages and disadvantages of computer to design a structural concept of computer general motor. Under the guidance of this logic scheme, scientists succeeded developing a new type computer which successfully came into being in 1952, which was make the digitalization of computer come true. In the new type computer, scientists added the electrical principle and storage program. The theory of this three kinds of computer has laid foundation of the modern computer structure [1]. In memory of the contribution from Neumann to the development of modern computer, it is called as Neumann computer. In 1947, American scientist invented transistor used of computer after hard research. Therefore, an American physicist was called the originator of transistor by the world. The appearance of computer transistor has helped to enter the era of transistor. In 1972 scientists developed the world first microprocessor and then computer entered into the era of microcomputer.

Current development situation of computer science and technology

Currently science and technology has developed very quickly, and internet technology has been widely used so that computer has been incorporated in different domains of people's production and

living life [2]. As a critical technological support, computer has been an indispensable part in people's working and daily life. Meanwhile during the usage of computer, some distinctive features have appeared gradually. For example, in people's daily life, intelligent appliances have been widely used providing huge convenience for people daily life. Besides, to satisfy people's diversified demands, different kinds of computers have come out. For example, notebook, desktop and tablet PC come out with more diversified product functions and fast updating speed of products. Generally, at present the situation of computer development is good.

Reasons of the development of computer science and technology

Inevitable trend for time development

During the Second World War, in demand of warfare, to intensify the refined treatment of military information and improve the level of counterintelligence process, computer technology was required for a higher standard. Based on this situation, the development of computer science and technology has achieved disruptive progress [3]. Since then, computer has embraced a hot trend for development in the whole word with broadening application range such as in economic and educational field. The development of computer has been following the principle of market oriented to utmost satisfy the market demands.

Relatively steady choice mechanism foundation

What influences most on the computer choice mechanism is the gradual improvement of technological value. Thus, people has reached the census on the generality which costs a period of time and constitutes the foundation of computer choice mechanism. The formation of choice mechanism with the precondition of the technological development direction of computer should consider the impact of surrounding environment in the selection forms, which is one of the most important reasons to promote the development of computer [4]. Innovation of this mechanism have stimulated the innovation of computer technology in a certain range. Since computer has been applied to multiple disciplines so that it has enlightened people during its application. Due the existence of option mechanism, the development of computer is faced up with many problems. To effectively solve problems, scientists have taken relevant measurements which at the same time have promoted the development of computer science and technology during the application.

Development of science technology requires computer to be the support

The development of science technology requires for more accurate and effective tools as support, so computer science has satisfied the new requirement from scientific and technological advance for supporting tools. For example, it requires continuous innovation during the precision calculation of large amount of data and implementation of astro-observation and other scientific research activities. With the upgrading of computer, it is playing more and more important role in people's life as a critical tool in people's work, study and daily life [5]. Meanwhile, innovation of computer science and technology has brought vitality to the development of other industries.

Requirement proposed by industrial development

In 1920s and 1930s, the voice from Industry Association of America to develop and intensify the computing capable machines has been responded many countries. Various research institutions have put a large amount of human power and material sources. This has laid the foundation of computer development and proved the huge impetus from market demand to computer development. It was the demand from industrial development on faster operating speed and large arithmetic quantity had speeded up the progress of computing development.

Vigorous promotion of technological innovation

Another reason of computer science and technological development is the technological innovation. During the continuous progress of computer science and technology, the good prospect has been accepted by many scientists who have proposed many theories. This has provided theoretical guidance for future development of computer science and technology

Individual application demand for computer

At present, the scope of its application has been broadened gradually. With the continuous development of internet technology, more individual users own their own computers so that they have known further about detailed functions and the technological principles. With the improvement of scientific level, the informationization degree of human society has deepened. With era of intelligence approaching, more people choose computer in their work, daily life and entertainment. It is believed that in the near future, computer will be far more popular and get stronger developmental force due to different requirement from users.

Development characteristics and direction of computer science and technology

After 60 years' development, currently computer science and technology has developed more rapidly and obtained more attraction from the society. Through the analysis on the current situation of computer development, the development features of its future development present in below aspects:

Future development characteristics of computer

Higher operating efficiency
With the continuous development of computer science and technology, its operation stability and efficiency has been inevitably improved. Through the analysis on the microprocessor developed by Intel, the integration of transistor has been higher than 10 billion. This shows that one computer can use and process a large amount of processors at one time. High efficiency of it is mainly reflected that the connecting efficiency between computers and the communication efficiency between different processors. The improvement of the efficiency in these aspects during the operation of computer has laid solid foundation of the improvement of the computer management efficiency so that it can guarantee the harmonious running of various systems in the computer.
Computer is applied in broader fields
Make analysis on the current development situation of computer, computer science and technology will be continuous applied and expanded into more domains to realize the internalization in different domains in social life. For example, use computer to control the machine operation in factories and use computers to manage the agricultural production. Besides, the variety of computer will be more diversified so as to satisfy consumers' multiple demands. Then the price of computer will be reduced with faster updating frequency so as to improve the convenience of computer application to better serve people's production and living.
The development of computer will be deepened
AI is the main direction of computer's deepening development. Through carrying out further researches of AI, the communication between human beings and computers will be more convenient. Besides, the development of centennial memory. Thus, with the improvement of computer science and technology development, the functions of computer will be further consummated so as to realize the comprehensive application.

Future development trend of computer science and technology

The uprising of high-performance computer
So far with the maturity of computer chip technology, the potential of rail technology development is appearing. Carrying out the computer researches internationally mainly focus on three domains, quantum computer, photon computer, and bio-computer.

(1)quantum computer

The precondition of quantum computer development is the silicon chip technology. As a physical unit, quantum computer follows the rules of quantum mechanics so as to launch logical operation, sore and process quantum information, and conduct high speed arithmetical operation. Compared with traditional computer, quantum computer has improved the data storage quantity and algorithm speed. It has especially better performance than traditional computer in the confidentiality and security.

(2)photon computer

Computer with photon for data calculation, transmission and storage is photon computer. Replace quantum in traditional computer with photon and that is to say to use optic interconnection to replace wire connection. Photon computer realized the innovation of computer hardware which is replaced by photon hardware so that photon algorithm becomes the principal operate mode. The principle of photon computer is to use photon with different wave lengths to quickly process figures with high complexity and large calculation.

(3)bio-computer

It has been thirty years since scientists proposed the concept of bi-computer, but bio-computer developed very slowly with insignificant achievements. The principle reason is that the scientific and technological talents in this field have focused on developing traditional computer so that the researches of bio-computer has not been carried out effectively. In 1980s, the research of bio-computer has started little by little with the most distinctive feature to use bioengineering technology to produce protein molecule as the chip material. It advantage is that with information transmission in the form of wave, the algorithm speed is much higher than common computer as its storage is large and the energy consumption level is low. These features are the targets of future development of computer. Besides, the protein molecule can reproduce so that if there is malfunction of computer during operation, bio-computer can eliminate the breakdown through conducting self-healing so that its service life has been lengthened. Currently, in scientific researches, bio-computer and relevant technology has been applied to reality and advantages of bio-computer, i.e. its high efficiency and practicability have been proved. For example, ultra-microbe robot, the invention is with the precondition of the research achievement of ultra-microbe technology.

The uprising of intelligent super computer

The most obvious feature of super computer is that it has realized the intelligence. The design structure of super computer is using new parallel processing technology, which is special. The computer system can realize the concurrent execution and process of multiple data and executive command. The feature will make the algorithm speed of super computer higher than traditional computer. Generally speaking, many processors in super computer can operate at the same time. For many tasks which require common computer or servers taking a large amount time to complete, super computer can complete those tasks within very short time. In advanced technology domains, computer can be used for data processing and model deduction for simulation experiment. Besides, since the computer performance approximates human brain so that super computer can provide life service for human beings. For example, during the animation production, super computer can make the color brighter.

Computer connects with internet more closely

The development of computer network can be divided into three periods. Since from 1995 up to now, the characteristic of commercialization of computer network is particularly outstanding. During this period, computer has become gradually international with its network impact scope widening into the whole world. With the expansion of internet coverage, computer and internet will be connected closely so as to provide convenience for social production and life and the future development of computer science and technology will present positive tendency.

Conclusion

With the development of the progress of economic society and scientific technology, computer science and technology has penetrated profoundly into various domains of social life. People have proposed higher standard for computer science and technology. Its development will inevitably show the trend of higher efficiency, wider coverage and higher technological level. It has brought far-reaching influence on people's work, study and life so that the social visage will change significantly.

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