Abstract

In the first half of the 21st century, important changes and paradigm shifts are emerging in information science and technology (IS&T):

(1) Information technology (IT) is entering a stage of mass adoption, and it is possible that we will see in the 21st century the "Cambrian explosion" of information technology applications. Computing for the masses will become the main theme in the next several decades.

(2) Saving energy and reducing pollution have become an important requirement in the development of IS&T. More attention will be paid to sustainable development and social harmony.

(3) In the next 10 to 15 years, Moore's Law that has been valid for the past 50 years will face unprecedented challenges.

(4) The existing arena of IT is changing from a man-machine symbiosis to a ternary universe of the cyberspace, the human society, and the physical world. Traditional IS&T is to be adapted to suit developing application systems in such a ternary universe.

(5) IS&T is penetrating various application areas and intersecting with biology, nano science, and cognitive science, to form new disciplines. Computing is becoming the fabric tying various scientific and technological disciplines together.

In our roadmap, from 2010 to 2050, the overall goals of IS&T development in China can be described as the following:

Playing an active and substantial role in the transformative change in information science and technology; Enhancing our capabilities of innovation and sustainable development to enable China to become a universal information society (U-society), in which most part of the population will be users of information systems, information will be the most important resource for the economy and the society, and the development level of information systems and their application in China will be close to the developed countries.

We suggest six major tasks and objectives to be focused on till year 2050:

(1) Constructing a ubiquitous, well-content information network.

(2) Realizing revolutionary upgrades of information devices and systems.

(3) Developing a data and knowledge service industry.

(4) Upgrading traditional industries by IT and realizing low-cost informatization.

(5) Developing new information science and interdisciplinary sciences based on computation.