

Evolution of Digital Economy & Implications for Government Policy

By *Katsuhiko KAJI*

Overview

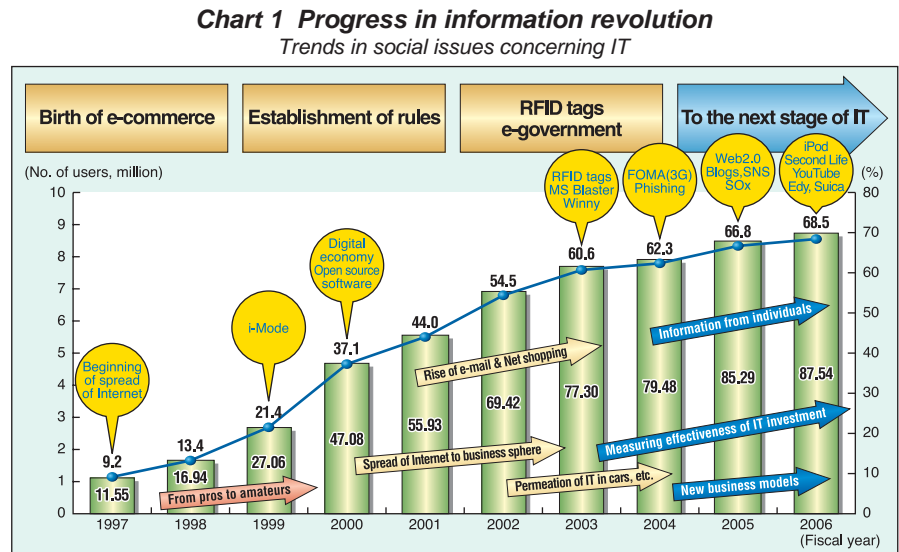
In the past decade, the Internet has spread its influence to more and more aspects of everyday life around the world, supported by a rapid global increase in the number of people with access to PCs and Internet-capable mobile phones (*Chart 1*). As the availability of basic IT infrastructure has improved, there has been a trend towards the development of new kinds of services which take advantage of this environment in a whole new way.

A new “digital convergence” is taking place, not just of the means of communication (such as the much-touted convergence of broadcasting, and fixed-line and wireless communications), but of previously separate ideas, technologies and services. This can be seen in two very different examples: Apple’s iPod, and the Japanese JasPar Project.

New Trends in the Digital Economy

Apple’s iPod has become a runaway hit, turning the computer maker into one of the coolest and most fashionable manufacturers on Earth. The iPod is popular globally, but when one observes the barriers that it has broken, they are by no means limited to the fact that the music player has trans-regional appeal. The iPod, like many devices nowadays, is supported by a complex assortment of value chains, with a brand emanating from the United States, parts produced by suppliers all over the world (principally in Asia), and a mirror-like surface coating by a specialized company in Japan.

The iPod, like the iPhone which it has since spawned, is a sophisticated device, but is not usually described as a technological breakthrough as such. Indeed, it has been often noted that the basic components and technology required by the iPod were in the hands of many other electronics companies at the time of its



Source: Data from Ministry of Economy, Trade and Industry (METI)

birth. It succeeded not by some profound technological leap but rather because it was (and is) an exceedingly clever assortment of the right sort of technology, packed in an attractive package and made available at an appealing price.

At the same time, it was not just a music player but a new kind of music player, seamlessly linked with the iTunes music service, and a platform for hundreds of third-party companies to offer services on, from news services eagerly providing podcasts to car companies offering “iPod-compatible” audio systems in their cars. In other words, the iPod succeeded not (just) because it utilized advanced technology but because it *combined* hardware, software and content in an entirely new, cool, friendly and – ultimately – profitable way.

The JasPar Project, a joint effort by METI (the Japanese Ministry of Economy, Trade and Industry), major Japanese car makers and others to develop embedded software for automobiles, is not nearly as flashy or well known as the iPod. Yet, in a different way, it too clearly demonstrates the properties of

the “digital convergence.” The underlying problem facing the car makers which the project attempts to address is simple. The rapid advance of electronics means that an increasing proportion of the cost of making a car is accounted for not by mechanical gears and levers but by electronic parts, digital entertainment systems and, crucially, the software that coordinates the activities of those electronic devices.

In other words the JasPar Project too is a demonstration of the new “digital convergence,” an attempt to produce software that integrates seamlessly with hardware, with competitors collaborating to establish a common platform to dramatically reduce development costs, and at the same time increase the reliability of the software programming. By utilizing IT to transcend traditional barriers between hardware and software, and the very different (but just as real) barriers between the different automobile companies, it attempts to create new knowledge and value, whereas traditional approaches would have attempted to find solutions within the boundaries of traditional fields and organizations.

Analyzing the Digital Economy

These two examples help demonstrate the power of IT as an enabling technology, not just reducing costs but helping create an entirely new spectrum of businesses and services. Of course, the concept as such is not a new one – the iPod was launched in 2001, and the idea of a global innovation “platform,” supported by advances in IT, features prominently in the bestseller *“The World is Flat”* (Thomas Friedman, 2005). However, with the continued acceleration of the globalization of the world economy and the intensification of already fierce competition across all industries that has been its result, the need for innovation, creating new services and new industries, has grown more urgent, for individual companies and for the national economy as a whole. As a result, the need for a policy framework that takes into account the “digital convergence” and works to create an environment in which it flourishes has also become more important.

In Japan, the foundations of such a framework have already been provided by previous reports by METI research groups and subcommittees, most prominently the March 2005 report by the Information Economy Subcommittee titled “The Information Economy and Industry Vision.” The latest report by the Information Economy Subcommittee once again tackles the concept of the digital economy head-on, incorporating the advent of web-based services such as SaaS (Software as a Service) and exploring the idea of the “digital convergence.” It notes the effects that globalization, the rapid growth seen in developing economies and the spread of IT have had on the Japanese economy; points out the challenges presented by these great trends; and maps out the policy implications conceived from this state of affairs.

3 Guidelines for Government Policy: Global, Open & Green

The essence of these findings can be described in three rules by which government policy should be guided in order to achieve economic growth through the combination of knowledge and technology: *Global, Open and Green*. Hereafter I will attempt to explain briefly the think-

ing behind each of these, and follow with the policy proposals that flow from them.

For many – perhaps most – readers of this article, *Global* may seem to be too obvious to be worth stating again. It is, however, essential that it be restated, for the simple reason that not all aspects of government policy, or of companies’ decisions, have been adjusted to the new global background. In many high-tech industrial sectors, the perspective is still geared towards the domestic, rather than international, market. Mobile phones in Japan are a prime example.

Despite the undisputedly high functionality of Japanese handsets, the worldwide market share of Japanese mobile phones is tiny – so much so that the sales of all the Japanese makers combined do not match those of Nokia, the number one, or Samsung, the number two. The superficial reasons for this can be explained in the differing standards used in Japan and most of the rest of the world in second-generation (2G) digital mobile phones, and the early adoption in Japan of third-generation (3G) devices. However, the underlying, deeper problem is that Japan, with over 100 million handsets in circulation, is a sufficiently large market to be attractive on its own to the Japanese electronics makers, who subsequently failed to channel their energies into expanding abroad instead of competing at home.

Thus, although the technologies incorporated in the latest Japanese mobile phones are very often cutting-edge, they lack the mass quantity required to spread costs and lower prices, which in turn limits their attractiveness to consumers outside the domestic market. This same lack of international outlook can be seen in a surprising number of other high-tech industries, starting with the IT services industry. In order to keep themselves competitive in the continuing process of globalization, companies must realize that the most effective combination of knowledge and resources, not confined by national boundaries, is vital to their survival, and design their international strategies accordingly.

Open is another buzzword, used in a bewildering variety of situations. There is no doubt that Japan, in terms of government regulations on trade and the economy, is far more open than it was

even a decade ago. There is also no doubt that the much newer concepts of openness, especially relating to IT, have proved their potential – witness the success of open source software (OSS) such as Firefox, the internet browser, and Linux, the operating system.

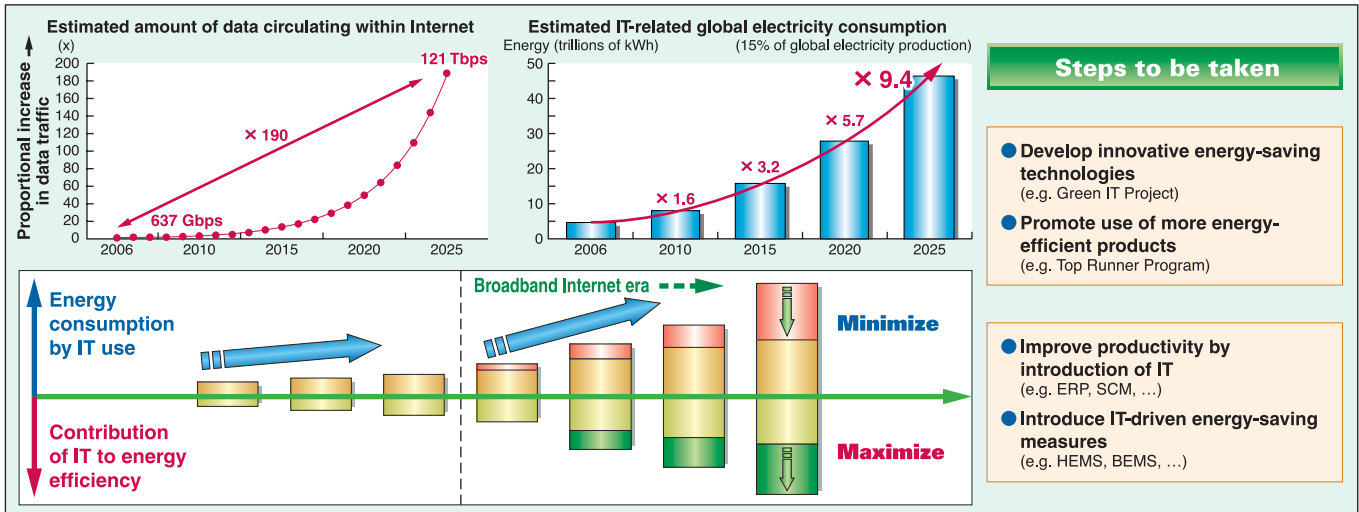
Yet unwieldy regulations on the part of the government, and a tendency towards secrecy on the part of IT users and makers, remain. It has been pointed out that intellectual-property laws have, perhaps, not kept pace with the rate of technological innovation with respect to, say, the workings of web search engines. Some companies are understandably reluctant to venture into legally gray areas regarding issues such as intellectual property rights and information privacy. Thus, minimization and clarification of government restrictions in areas where they unnecessarily impede innovation should be the cornerstone of new IT policy.

In addition, industry practices too need to be considered to foster greater collaboration and efficiency. In areas where competitive advantages can be sought through specialization, the protection of novel ideas should, of course, be guaranteed. However, in areas that are not – bread-and-butter IT systems, for example – too much secrecy merely invites unnecessary replication and a subsequent increase in costs. Support for initiatives to avoid such a fate on behalf of suppliers and consumers through the spread of best practices, model contracts and collaboration between companies and academia should be provided to the extent that they do not induce overreach on the part of the state. Also, attempts such as JasPar to facilitate the common use of certain IT modules should be encouraged further.

Last but by no means least, *Green* has come to be demanded of all aspects of society these days and IT and the digital economy are no exceptions. In terms of energy consumption and CO₂ emissions, there are two perspectives of IT – as a great source of electricity usage, and as a tool to reduce the damage caused by a wide variety of sources.

To start with the former, it has been calculated that various IT devices, networks and systems consume about 3% of the total electricity generated in the world today. This is the result of the aforementioned widespread adoption of

Chart 2 IT & the environment



Source : Data from Ministry of Economy, Trade and Industry (METI)

ever more IT appliances, many of which connect to communications networks and servers which themselves must be strengthened to cope with the load. This trend, if unchecked, could mean that by 2025, IT-related electricity consumption could amount to five times that of today in Japan, and more than nine times today's figures globally. Solving this problem requires the development, and perhaps more importantly adoption, of much more energy-efficient devices than are currently in use. (Chart 2)

The effects of IT on the environment, however, need not be purely negative or even negative in sum. This is because IT can also be utilized to reduce waste and cut down on energy consumption. Heating and lighting systems, for instance, are usually inefficient since they are kept on even when they are not needed. By controlling such systems through

the use of IT, energy consumption can be drastically reduced without a corresponding drop in convenience. The same can be said for logistics and transportation systems, which are a source of large amounts of greenhouse gas emissions. Thus, by combining IT with existing technologies, reductions in energy usage can be realized to the benefit of all.

From these broad principles, specific policy remedies can be prescribed, and are already being pursued by METI and the Japanese government as a whole. The JasPar Project, already mentioned in this article, is an example of industrial, academic and governmental collaboration with both a *global* and *open* viewpoint. The acceleration of the construction of a truly efficient e-government is in part aimed at creating a more innovative business environment, with government services opened up to private ini-

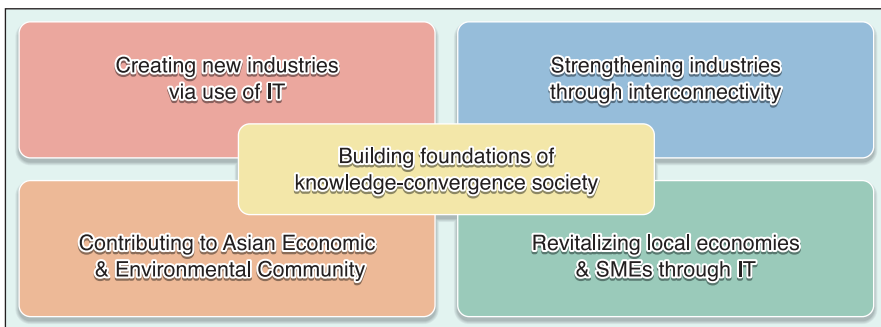
tiative. The Green IT Initiative, which combines R&D with concrete proposals for companies to improve the energy efficiencies of various systems through the use of IT, has attracted international support. Many more courses of action, from increasing the transparency of industry practices to developing vital basic technological expertise, have been taken, and will be selected and reinforced where appropriate. (Chart 3)

Conclusion

Through all of this, the basic analysis must not be forgotten. The world is changing rapidly, especially in economic terms, and IT is one of the most important keys to keep up with this change. By using IT to weave together previously disparate threads of knowledge, services and resources, a whole new round of innovation and growth should become possible. It is the job of newly empowered individuals and companies to grasp this chance – and that of the government – to ensure that such an environment can be kept alive and well. **JS**

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Chart 3 Policy objectives for knowledge convergence & economic growth through IT



Source : Data from Ministry of Economy, Trade and Industry (METI)