

INSIGHT AND EMERGING CHALLENGES ON JAPAN'S INFORMATION AND COMMUNICATION TECHNOLOGY SECTOR

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ABSTRACT

The more science and technology has advanced, the more of research and development have been active in businesses, and businesses have been benefited from their outcome. Not only businesses enjoy the outcome on their own, but they also export the outcome to cross-borders, so called technology trade. Japan generated 1.63 trillion Yen excess of export out of technology trade in 2008. The export has sustained the Japan's economy. This paper explores the insight of Japan's technology trade, points out a remarkable excess of technology import in ICT sector, and describes Japan's challenges for establishing technology competitiveness in ICT sector.

Keywords: ICT, information and communication technology, technology trade, technical know-how

INTRODUCTION

According to Ministry of Internal Affairs and Communication, the technology trade is defined as providing (exporting) and receiving (importing) patents, utility models, technical know-how result from research and development efforts in science and technology to cross-borders. They are traded internationally in the form of transfer of rights, approval of utilization, and others. It also reported in its Johotsushin Hakusho 2010 that Japan has generated 1.63 trillion Yen excess of export out of technology trade in total of all industry sectors with 2.23 trillion Yen of export and 600 billion of import in 2008.

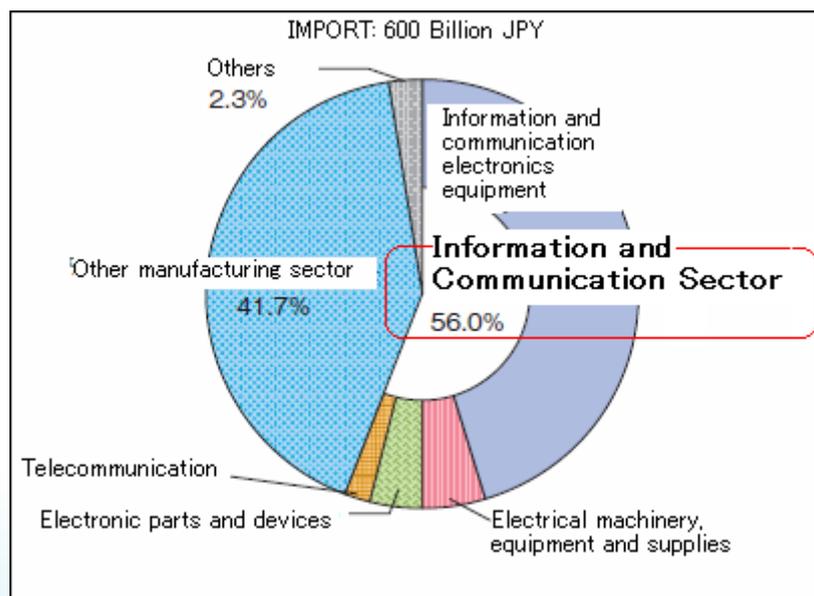
It could be recognized that Japan has taken advantage of its competitiveness in technology trade and generated larger volume of export than import. However, there is another remarkable finding in terms of Japan's import out of technology trade. As Figure-1 shows, there is a distinctive nature in Japan's import out of technology trade that Information and Communication sector shares 56.0% of total technology import in 2008. The data highlights a Japan's remarkable dependence on technology import in ICT (Information and Communication Technology) sector.

JAPAN'S ICT SECTOR

Japan has enjoyed its competitiveness in technology especially in manufacturing sector such as automobile industry. According to Kagaku Gijutsu Hakusho 2007 issued by Ministry of Education, Culture, Sports, Science and Technology-Japan, the automobile sector generated excess of export about 1.12 trillion Yen out of technology trade in 2005 shown in Table-1.

While generating its technology competitiveness in manufacturing sector, however; Japan has been facing challenges in developing ICT sector competitiveness. Actually, Ministry of Internal Affairs and Communication pointed out the investment for enhancing information accessibility as one of key challenges for Japan's revival. Although Japan has developed an advanced information and communication infrastructure, it is still in behind in terms of capturing the competitiveness in ICT sector.

< Figure-1: Technology Import by Industry Sector in 2008 >



(Source: Johotsushin Hakusho 2010, Ministry of Internal Affairs and Communication: Translated in English)

< Table-1: Japan's Technology Export / Import in Automobile Sector in 2005 >

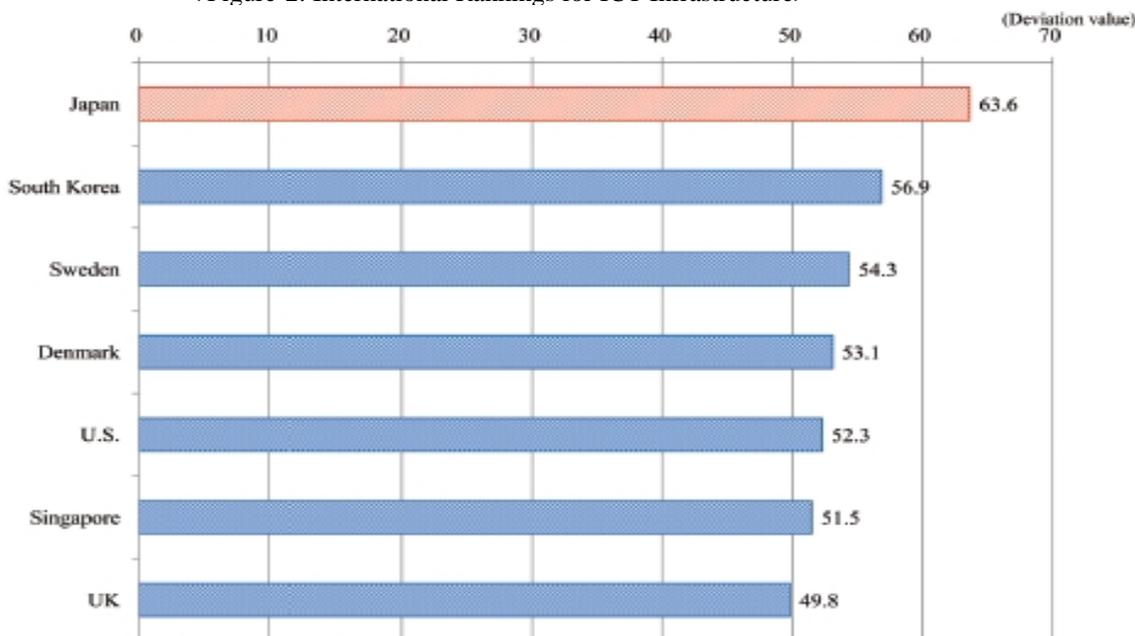
Counterpart Countries	Export	Import	(0.1 Billion JPY)
			Export - Import
U.S.	5,798	70	5,728
Thailand	931	0	931
U.K.	558	11	547
China	393	0	393
Indonesia	371	-	-
India	232	0	232
Australia	217	0	217
Taiwan	178	-	-
South Korea	58	2	56
Others	2,549	45	2,504
Total	11,286	129	11,157

(Source: Kagaku Gijutsu Hakusho 2007, Ministry of Education, Culture, Sports, Science and Technology-Japan: Translated in English)

Figure-2 is the result of ICT ranking evaluation conducted by Ministry of Internal Affairs and Communication. The evaluation was developed in terms of 12 indices in 1) user charges, 2) speed, 3) security, 4) mobility, 5) dissemination, 6) infrastructure element. The over all evaluation rankings were developed by calculating the mean deviations for each index for each country. While it is evaluated that Japan has advanced ICT infrastructure, the ICT competitiveness has been lost since 2004 shown in Figure-3.

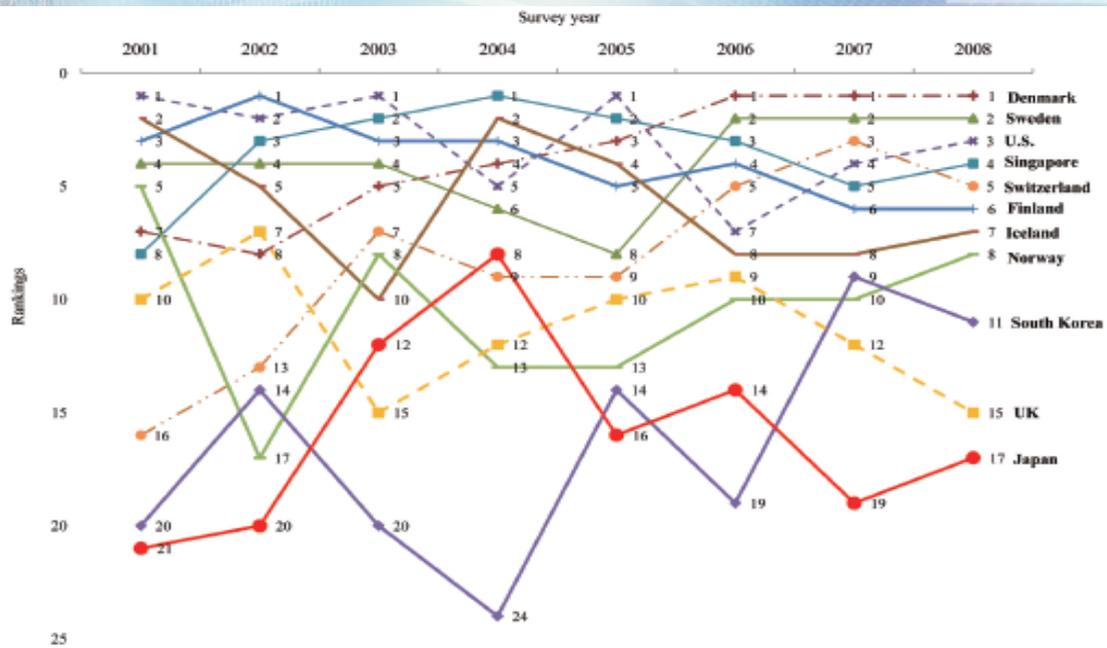
As government has promoted e-Japan Strategy in 2001 and 2003, the ICT infrastructure has successfully been advanced, however; it became clear that the utilization of the ICT infrastructure remains low. Thus, policy priority was shifted to enhance the utilization of advanced ICT infrastructure to form the competitiveness in ICT sector, and in order to actualize it, the investment for enhancing information accessibility became the key factor.

< Figure-2: International Rankings for ICT Infrastructure >



(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

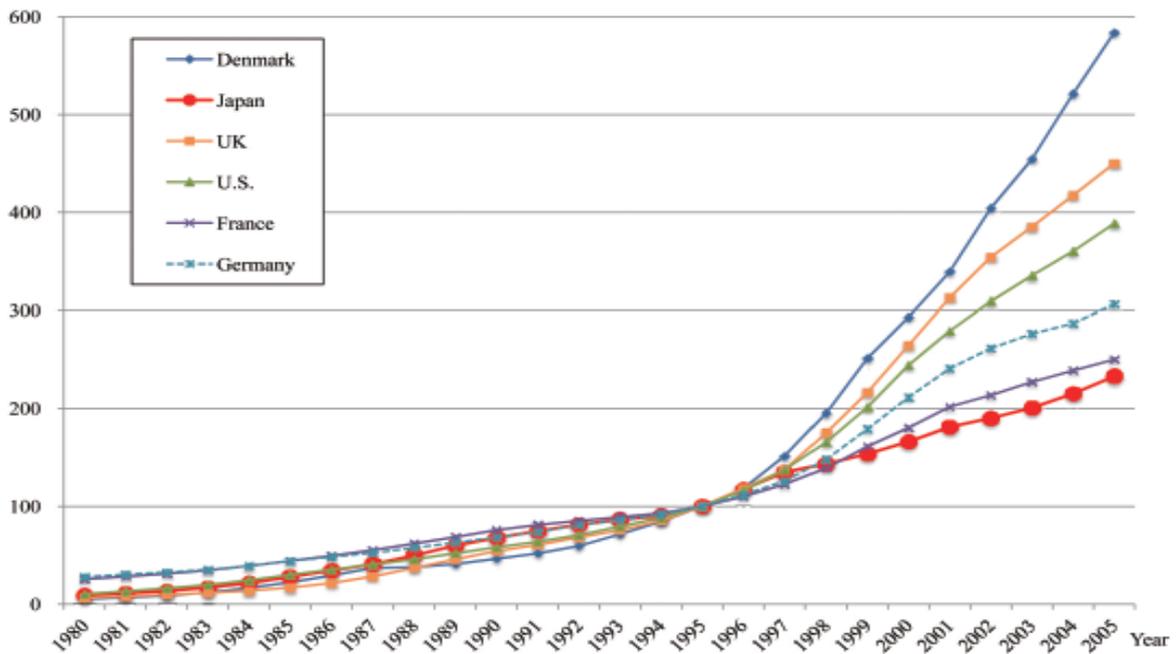
< Figure-3 Changes in ICT Competitiveness Ranking >



(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

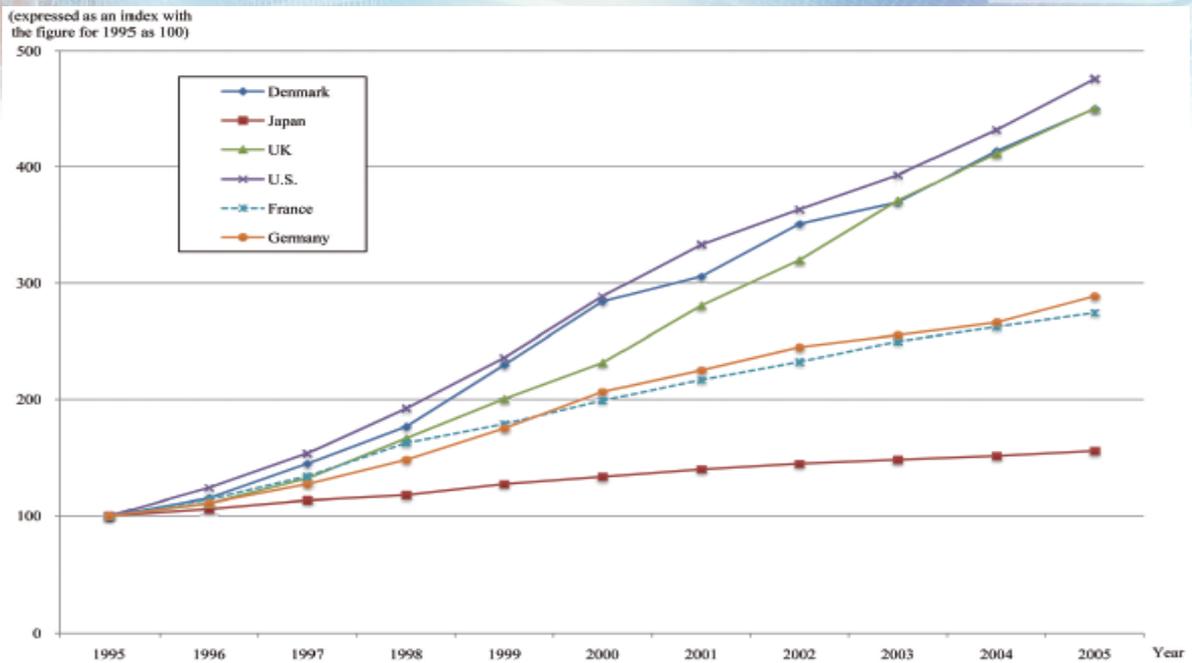
< Figure-4 International Comparison of Growth in Information Capital (for the entire industry) >

(expressed as an index with the figure for 1995 as 100)



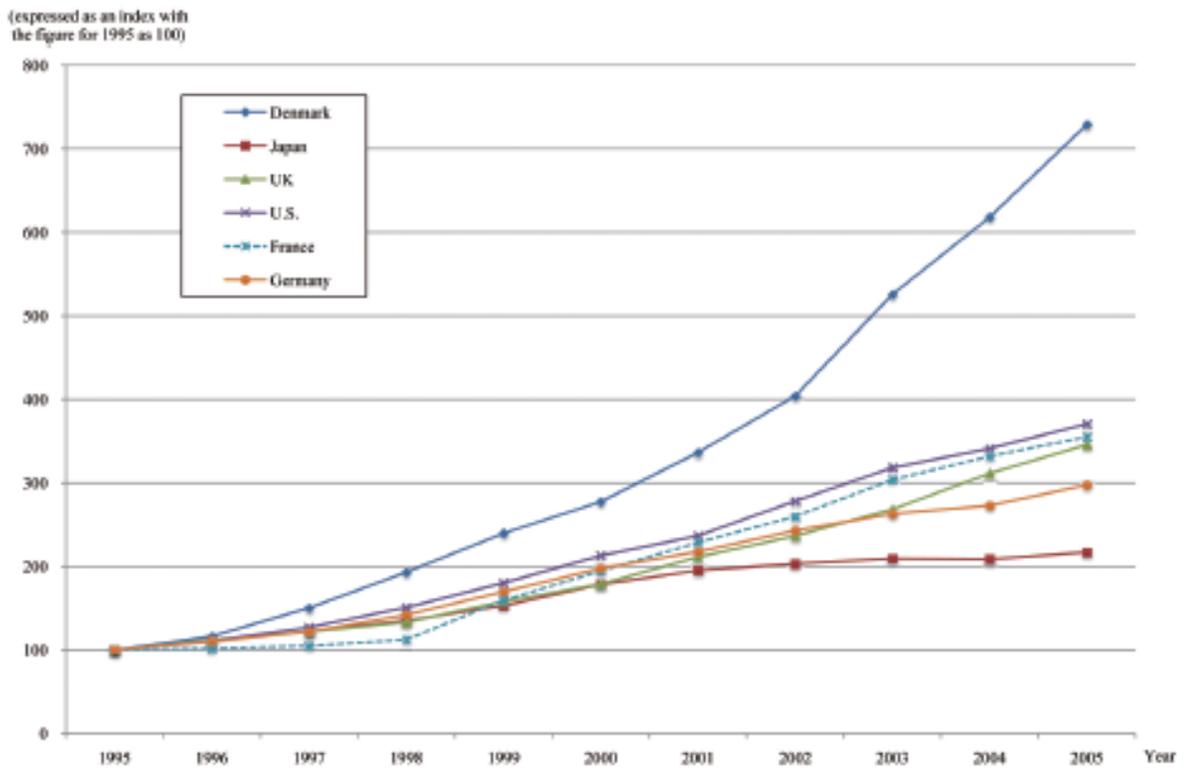
(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

< Figure-5 International Comparison of Growth in Information Capital (Wholesale/Retail/Transportation Industry) >



(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

< Figure-6 International Comparison of Growth in Information Capital (Education/Healthcare/Other public service) >



(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

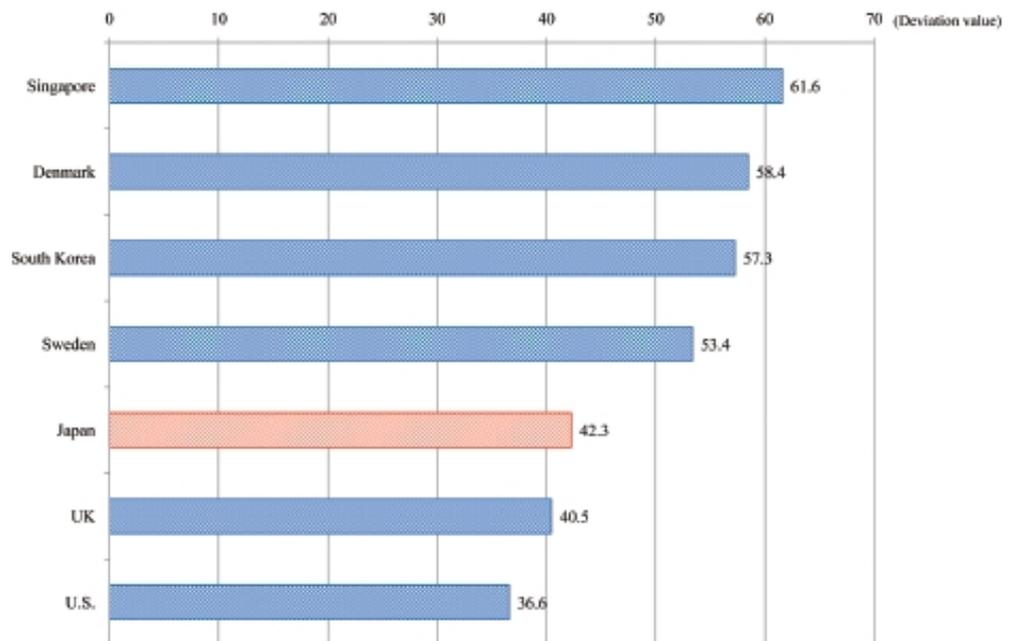
JAPAN'S INFORMATION CAPITAL

Information capital includes tangible and intangible asset consisting of databases, information systems, networks, and technology infrastructure. This information capital could be divided into two major category, hardware infrastructure and software applications [5]. Japan's information capital, especially software applications through which information and knowledge are obtained, has not successfully grown since 1995. The installation and accumulation of application software has not been successful in Japan. As Figure-4 shows, it has the lowest growth among the counterpart developed countries in the world. Although the figure is a comparison with entire industry, the same phenomenon remains when you look into each industry. The Figure-5 and Figure-6 show the growth in information capital in wholesale/retail/transportation industry and education/healthcare/other public service industry respectively as examples. It shows the less growth phenomenon same as entire industry. There is a remarkable gap between Japan and other countries in terms of information capital growth. The less growth of information capital has negatively affected to develop competitiveness in ICT sector which was shown in Figure-2 and it would be the major contributor making Japan depend on import out of technology trade in ICT industry sector.

FINDINGS

Although Japan has enjoyed its advanced technology and competitiveness in manufacturing sector, on the other hand, it has struggled to develop competitiveness in ICT sector especially in software application despite the fact that Japan has world's advanced ICT infrastructure. Because the software application side of information capital which information and knowledge are obtained has not successfully been accumulated, there is a lack on accessibility and utilization of the ICT infrastructure as shown in Figure-7. The problem is that there is no car driving on the highways invested. The figure was reflected the result of online questionnaire targeting users in the seven countries. The survey on utilization includes: 1) healthcare/welfare, 2) education/personnel, 3) employment/labor, 4) administrative services, 5) culture/arts, 6) corporate management, 7) environment/energy, 8) transportation/distribution, 9) security/safety, 10) e-commerce. It is consensus that IT itself is not valuable to improve performance or create any competitive advantages [7]. Investment in ICT infrastructure does not play any role without developing and utilizing the software applications on the basis of the infrastructure.

< Figure-7: International Rankings Relating to Utilization of ICT >



NB. Deviation value was calculated from the mean value of the sum of the rate of utilization for each area

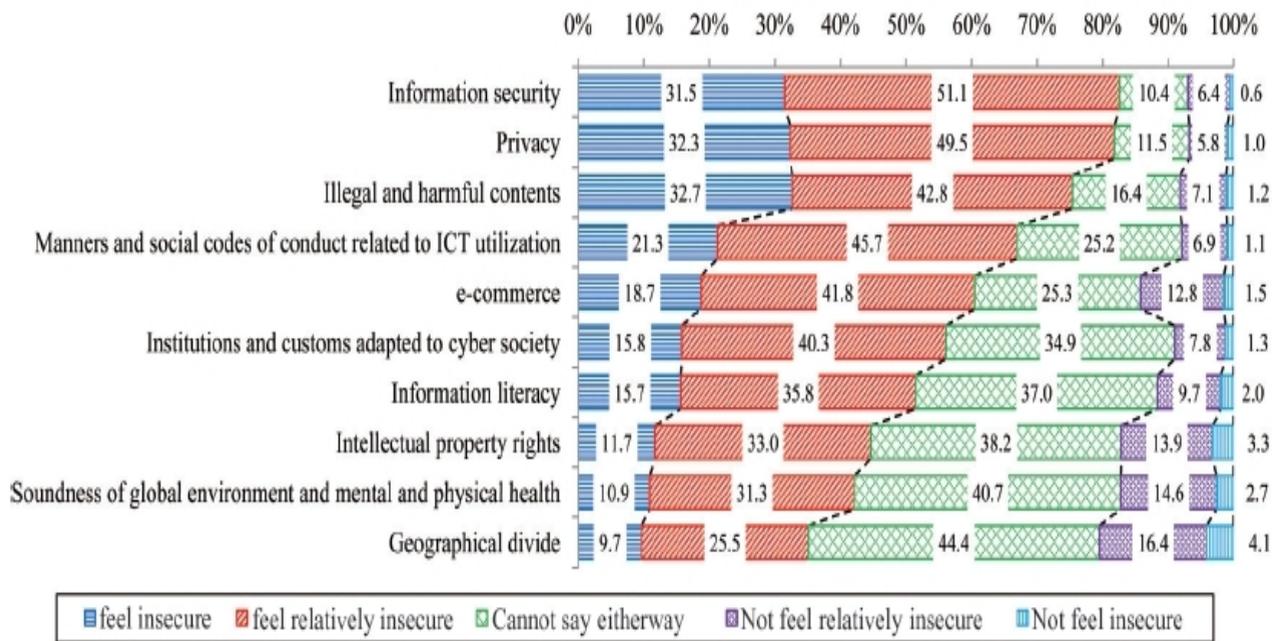
(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

Of course it is clear that maintaining and strengthening the competitiveness in manufacturing sectors which Japan has been good at is important for sustainable economic growth, but more importantly, overcoming weakness in ICT sector by accumulating information capital especially in software applications and developing advanced software technology which could also be exported to cross-borders as well as manufacturing sector would be the most critical key factor for Japan's economic regeneration. Japan has enjoyed its technology competitiveness in manufacturing hardware such as automobile (Toyota, Honda) and electric machinery (Sony, Cannon). On the other hand, Japan has faced the challenges to develop competitiveness in software application field. Given that in 2008 when the economy as whole shrank due to the influence of the global recession, ICT was the only sector to grow in Japan. The average contribution rate of the ICT industry to economic growth over the five years from 2002 to 2007 was about 34% [2]. Developing competitiveness in software application industry and the growth in ICT sector would be the key factor for the future economic prosperity in Japan.

COMMENTS

High security consciousness among Japanese people shown in Figure-8 to the information treatment would enlarge the reluctance to enhance information capital utilization. In many business fields, the formal and important information is still handled in paper based by traditional way in Japan. On the other hand, the utilization of blog has been rapidly growing. This phenomenon would be led because the information treated within the blog world is informal and the participants would feel less security conscious to utilize the blog.

< Figure-8: Citizens' levels of concerns about 10 safety- and security-related categories >



(Source: Johotsushin Hakusho 2009, Ministry of Internal Affairs and Communication: Translated in English)

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