IT REVOLUTION and eODA

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SUMMARY

The development of information technology (IT) is one of the driving forces of the global economy. The development and spread of IT, for example the Internet, helps to promote international economic transactions. The worldwide deregulation and privatization of the telecommunications field, which was a regulated field, encourages the process of technological innovation and diffusion, and technological progress leads to worldwide economic liberalization and deregulation. The global market, created by this cycle of technological development, provides new opportunities for development in developing countries.

However, technological competition inevitably creates countries, regions and people that are shut out from development. Such disparities are known as the information gap, or the 'digital divide'. The digital divide exists between developed and developing countries, as well as within country borders. It is widely recognized that the digital divide must be narrowed to help the sound development of the global economy and to create stability in international society.

Many policies are currently under way, aimed at narrowing the digital divide (the information gap generated by computerization and the economic disparities generated by the information gap). The G8 Summit, which took place in Okinawa in July, adopted the IT Constitution, which called for cooperation between governments and the private sector to bridge the digital divide. At the same time, the Japanese government announced the preparation of a comprehensive policy package for narrowing the digital divide. The five-year package, which will concentrate on the Asia-Pacific region, amounts to $15 billion of ODA and non-ODA government funding. This paper uses the term 'eODA' to describe the shift in development assistance (mainly ODA), towards the IT field, and examines the ideas needed to promote eODA. Specifically, this paper examines the indices for the state of IT development (eODA indices), the assistance fields for eODA, eODA platforms for information sharing in the IT field, eODA cooperation, and the technological development of new eODA.

Japan is currently the biggest ODA donor nation. It is our responsibility to reform ODA itself to direct it towards solving the global problem of the digital divide.

1. INTRODUCTION: PROGRESS IN INFORMATION TECHNOLOGY (IT) AND ITS IMPACT

The driving forces of the IT revolution are the rapid improvement of computer performance and communications and their dramatic fall in price. Since 1985, when personal computers first began to be popular, the cost and performance rating of computers has improved a thousand fold in ten years. It can best be explained using the example of the Nozomi, the superexpress train that runs between Tokyo and Kyoto, which costs ¥14,000 and takes two hours and fifteen minutes. After ten years, it would cost ¥14 and take eight seconds from Tokyo to Kyoto.

Significant development in the communications sector began ten years later. One reason was that the communications sector had traditionally been restricted by regulations, consequently there was little competition in this sector. In most countries, communications sectors were monopolized by the state, or state-owned enterprises. Another reason is that civil works largely shares the cost of the communications sector, and the depreciation of facilities, such as the switch-machine takes place over ten years or more. Therefore, the communications sector tended to insulate itself from the impact of technological innovation, and it did not begin to change until the mid-1980s. at this time, the privatization of the communications industry and the introduction of competitive principles on a worldwide scale began. Developed countries invested money and technology in developing countries, and as a result, achieved a

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great deal in the communications sector in many countries.

On the technological side, innovation in the two fields of wireless communications and the Internet played a significant role. The explosive worldwide growth of the Internet began in 1995, and the communications sector achieved the thousand fold improvement in this decade. At the same time, mobile wireless communication shifted from the analog first generation to the digital second generation, which began replacing the former and has spread throughout the world. Because mobile communication with wireless technology is less expensive for civil works, its progress has outstripped that of fixed communications lines in many developing countries. This new technology means that developing countries do not have to follow the development of the developed countries. Instead, they have the chance to jump over unnecessary development stages which the developed countries experienced.

These changes have just begun, but their impact is greater than expected. Japan has led the unification between cellular telephones and the Internet, such as text information services on cellular telephones[1]. In 2001, Japan is planning to introduce the third-generation cellular telephone. Two big movements in technological changes in the communications sector are the shift of communications terminals from PCs, and the shift to ubiquitous networks[2]. The shift to Non-PC means that the terminals connected to the Internet will be personal devices and home information devices rather than PCs.

Ubiquitous networks mean that in the future the enormous terminals will be able to connect to the Internet from any location. The network structure shifts from the centralized, hierarchical style to a 'Microdesic' style (microdesic being an abbreviation for micro-geodesic, which means all communication points are interconnected to all others)[3].

IT development is changing the world. For example, the diffusion of faxes and personal computers (equipment and means of communication) partly contributed to the collapse of the Former Soviet Union and the systems of the former communist bloc. Thus, the technological innovation made it impossible for the states to control the flow of information. The spread of personal computers makes it possible for developing countries not to spend on large, expensive computing systems. Consequently, the developing countries use cheap and available personal computers as a means of production. They are now able to participate in the electronic commerce and software development industries. In addition, advanced data communication makes much easier the international mobility of the intellectual labor force much easier. High quality but low wage workers in remote developing countries can easily perform the jobs of developed countries through communication lines. The rise of the software industry in India is a good example of how IT contributes easier for intellectual labor to move beyond borders, and this movement is becoming a global trend.

As the Internet spreads into our lives and industries, people are more aware of the importance of software infrastructure in development, rather than hardware, such as communications lines and personal computers. For example, the following issues are considered as important IT infrastructure for social development: educational issues, social systems and regulations and initiatives towards electronic government. From this perspective, many countries are releasing regulations on electronic commerce transactions and promoting initiatives for capacity building and electronic government. For example, the e-readiness index, which was recently announced by APEC, classifies a country's IT infrastructure into six categories, according to its readiness for electronic commerce transactions. Awareness of IT infrastructure is commonly shared by many countries, including developing countries. Capacity building and improvement of the literacy levels of the whole population move faster in urban economies, such as Singapore and Hong Kong. The progress seen in the electronic commerce sector in Asia has, therefore, followed an aerobatic display pattern[4], in which their paths are mixed in disorder like aircrafts as opposed to the 'flock of geese' pattern.

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1 This service began by NTT Docomo's i-mode in 1999.

2 "Ubiquitous" means "present in all places at the same time" in a Latin word. A ubiquitous network is a more advanced data network in which anyone, anywhere, at any time, can use an information terminal connected to the network.

3 S. Uesugi, N. Mizutani, T. Shinohara, H. Sanada "Microdesic Network" INFORMS-KORMS Seoul 2000, June 18-21, 2000.

4 Edward. Y. Chen (President, Lingnan University) "The Development of IT Industry in Hong Kong" Asia Forum presentation text. (http://www.tcf.or.jp/)

2. THE DIGITAL DIVIDE

The digital divide exists between developed and developing countries, and even within a country; it exists in various forms between regions, professions and generations. This section examines the relationship between the digital divide and policies to promote competition through the communications sector, a relationship which is easily observed.

As mentioned above, the communications sector has achieved significant development due to global privatization and the introduction of market competition. Leading factors in this development are the impact of technology and private sector funds transferred from developed to developing countries. However, the private sector money does not have an impact on the poorest countries, where there is no prospect of a return on the investment, and therefore the digital divide is widening between the developed and poorest countries. A similar disparity is emerging between the urban and rural areas in developing countries.

In the mid-80's, when liberalization and competitive principles were promoted in developed countries, they faced the problem of how to guarantee universal service[5] within each country. According to the definitions in OECD report documents, there are three general concepts of universal service:

- Geographically universal.
- Without discrimination in access conditions.
- Universal spread.

The telecommunication utilities industries were previously monopolies in most cases and were obliged to provide universal service. Therefore, the industries practised internal cross-subsidy, transferring funds from profitable sectors to unprofitable sectors. Once monopoly is abolished and competitive principles are introduced, cross subsidy is difficult. In the US, when AT&T was divided, and competition in the communications sector was started by the 1996 Telecommunications Act, the Universal Service Fund was established as a solution to the cross subsidy problem. The Fund was based on money drawn from the telephone service revenues of regional telephone companies and used to subsidize enterprises providing services in depopulated areas.

In global communications, it is natural that some countries and regions are not profitable under the complete privatization and competitive principles. Therefore, it is observed that a mechanism similar to a universal fund is required at an international level. However, it is not feasible to generate funds in unprofitable areas under the current situation; with no world government and under severe competition.

The privatization and liberalization of international communications has putthe poorest countries under even more severe conditions. There is an international charge calculation system for international communication between developed and developing countries, which distributes the revenue from calls.

Until now, this allocation of revenue was a valuable source of foreign currency for the governments of developing countries. However, recently the cost-based benchmark system, which is based on economic principles and promoted by the US was adopted, and consequently, it has reduced the level of allocation based on cost. Although it is natural that the revenue is decreased under economic principles, developing countries had to face a severe situation.

Another example of the way liberalization and market principles create disparities is the problem of the burden of cost for international Internet cables. When Internet operators in Japan and elsewhere in Asia connect to operators in the US, there is a problem over the allocation of costs for the international cable. The original rule for international communication was that the cost was split 50-50 between the two countries. However, since Internet operators are regarding private contracts, Asian operators have paid the entire cost due to the balance of power in the World Internet society. This situation has been hotly debated at APEC and the other international conferences.

Thus, liberalization and market principles in the field of telecommunications have greatly contributed to the progress of telecommunications around the world, but at the same time, they also have expanded the disparities. It is necessary to solve these disparities. Currently, the private sector has overwhelmed the power of governments. It is required to find new approaches which promote liberalization for the economic growth, but also recognizes that there are problems which cannot be solved under the private sector-oriented market principles.

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5 A system in which all the citizens of a given country or region can receive a certain level of communications services regardless of income levels.

3. INITIATIVES TO CLOSE THE DIGITAL DIVIDE

As stated above, the problem of disparities within and between countries under the spread of telecommunications has long been the subject of debate. The term 'digital divide' first appeared around 1996, when it was recognized that the development of the Internet was over the 'critical mass' level. Analysis of the ways in which the Internet spread clearly shows that the gap between the information 'haves' and 'have nots' has a tendency to expand. The problem first came to attention in connection with social disparities and with educating young people for the future. Concern has been rising rapidly since the Digital Divide Summit took place in the US at the end of 1999. In 2000, many international agencies, governments and private groups have announced initiatives to solve the problem. The digital divide was also a major theme of the G8 summit in Okinawa.

Information technology is a field that has been led by the private sector, and the telecommunications field has also come moved towards privatization. However, the bureaucratic and private sectors have recognized that market principles alone are not able to prevent the expansion of the digital divide, and this awareness is now prompting efforts towards public-private cooperation.

A few initiatives will be examined here.

The International Telecommunications Union (ITU)[6] is a UN agency specializing in telecommunications. It has promoted the standardization of telecommunications, coordination of satellite orbits and electromagnetic spectra allocation, and the development of telecommunications in developing countries.

'Many Voices, One World' was proposed by UNESCO in 1980 to rectify the situation of the North-to-South one-way flow of information and to establish a balanced flow by expanding the data communications infrastructure of the Southern countries. Consequently, this has been considered the ITU's greatest mission. In 1984 the Maitland Committee, established by ITU, announced its 'Missing Link' report, and the Telecommunication Development Bureau (BDT) was organized as a permanent department. At the plenary committee meeting in Kyoto in 1994 and the Second Telecommunications Development Conference in 1998, substantive measures for the development of data communications infrastructure, particularly in rural areas, began to be discussed. One example is the Multi-community Tele-center (MCT).

Focus Group 7 of the Research Committee of the ITU began to present Japan's proposals and to provide additional aid. It is a data-base constructed on the Internet, which accumulates good examples and ideas for regional development of telecommunications. The data-base gives valuable hints for the combining of wireless IP technology and wireless local loops (WILL)[7] with satellites and other methods.

Following these new technological developments, the Electronic Commerce for Developing Countries (EC-DC) Initiative has been set up with the cooperation of ITU and industry.

Many international agencies, such as the World Bank and UNDP, have announced their initiatives. The World Bank, which has abundant financial resources, has been developing the 'InfoDev' partnership. The Global Development Gateway is preparing to construct a development-related knowledge base. These moves are based on a strong awareness of the shift from the approach of the traditional communications sector to the concept of the information infrastructure sector, which includes technology, services and markets.

In the US, in April 2000, President Clinton gathered over 400 private companies and NPOs to launch his 'National Call for Action' initiative, which calls for joint efforts by government and the private sector to bridge the digital divide, and the private companies presented their domestic and international initiatives in July. Most of these initiatives aim to overcome the shortage of engineers in their own countries by educating engineers in other countries. Donations for the sake of corporate PR are also common. These donations and other efforts strongly reflect American corporate culture.

Private-sector groups, such as the World Economic Forum (WEF)[8] and the Global Business Dialog on Electronic Commerce (GBDe)[9], are also very active in this field. The WEF is promoting a Global Digital Divide Initiative. GBDe is gathering top management from big companies

6 The International Telecommunication Union was established in 1932 and became a UN agency in 1947.

7 Networks in which base stations and fixed terminals are linked by wireless connections.

8 A private NPO established in the 70s. At first it tackled European management problems, but it later turned to international issues.

9 GBDe is based on a round-table conference of managers within Europe which took place in 1998 at the instigation of the EC committee. Since then it has been active on a global scale.

in Europe, Africa, the Americas, Asia and Oceania, which offers policy suggestions to all governments to promote progress of electronic commerce around the world. Regional initiatives, such as eASEAN[10] are also emerging.

The IT Constitution of the G8 Summit in Okinawa specified the cooperation from groups, such as the WEF and GBDe, and welcomed contributions from the public sector. Dot Force is now taking actions to create the framework to put that cooperation into effect.

Japan also announced $15 billion development aid to be disbursed over the next five years, for which eASIA[11] and other plans are being organized. Many private volunteers are also working on IT-oriented development.

One example for public-private cooperation is the establishment of a fund for Internet entrepreneurs by the World Bank and SoftBank of Japan.

Clearly, recent movements have been progressing quickly. All the initiatives emphasize the need for public-private cooperation. However, no consensus has been reached on this direction. One specific example influencing the IT field is that these initiatives are sophisticated enough for the competitive market and their efficacy is yet to be assessed. It is hoped that various initiatives are generated and work together as part of an efficient system.

4. eODA AND eODA GUIDELINES

Japan is the world's largest ODA donor, and ODA is certainly a very important diplomatic channel for Japan, as one of the greatest beneficiaries of open economies.

However, due to Japan's severe environment for ODA, caused by Japan's domestic fiscal situation, greater efforts for effective ODA are needed. At the Okinawa Summit, Japan announced a $15 billion comprehensive cooperation package for improving the digital divide over the next five years, and this is a significant step for solving current problems. The term eODA is used to refer to the shift of development assistance, which is centered on ODA towards the IT field. To advance eODA, it is necessary for the ideas and processes involved in ODA to be examined. Therefore, this part examines eODA guidelines, described below. The eODA guidelines consist of the following five elements:

(1) eODA indices
(2) Fields for eODA aid
(3) eODA platforms
(4) eODA cooperation
(5) Technological development of eODA

4.1 eODA INDICES

It is important to establish indices in a new big project. Following two indices are important in eODA movement.

(1) The first index is the share of ODA that goes to the field of IT. At present, IT is not counted as a separate item within ODA statistics. The communication infrastructure field includes IT, but this field shares a small portion of total ODA, 2.2% in 1998. (Since the IT field is defined as a private investment field, aid to the communication infrastructure field has been decreased in the 1990s.) However, the definition of IT is significantly wider than that of the communication infrastructure field. For example, currently, most machines have built-in IT devices, and many other fields such as education and medicine have promoted the introduction of communication technology or personal computers. Therefore, it is important to define clearly the IT-related share of ODA. It does not need to be very precise, but it would be important as a yardstick to measure the achievement of IT-oriented efforts.

(2) The second necessary index is an e-development index for developing countries. Some indices have already existed, such as the e-readiness index produced by APEC, but another index is necessary which is able to measure values of the prosperity and diversity brought by IT. These values include the prosperity generated in a region by the introduction of IT, the development of Asian-style electronic commerce[12], and the progress of information in the mother tongue. This also indicates Japan's policy direction for contributing to development in developing countries. It is extremely important for developing countries to participate in this debate. This kind of index has already

10 A public-private consultative body on the correction of the digital divide. It aims to make the ASEAN region more competitive by building infrastructure and creating a regional marketplace.

11 Information and economic policies for Asia put forward by Singapore and other countries. It is an extension of eASEAN. Its objectives include sharing common rules for electronic commerce transactions and systematized settlement of disputes.

12 Specifically, Asia is seen as having production networks in place and B to B (Business to Business) exchanges are expected to flourish in the coming years. As this region has many densely populated urban areas, expectations are that B to C (Business to Commerce) exchanges using mobile phones and convenience stores will be developed, as is the case in Japan.

been discussed in a network of think tanks in Asian countries, centering on Japan.

4.2 FIELDS FOR eODA AID

In the IT field, the types of aid can be categorized into three as follows:

(1) Aid for IT
(2) Aid by IT
(3) Aid with IT

(1) Aid for IT

IT implies a wide range of concepts, from communication infrastructure, which is mainly a hard aspect, and intellectual aspects, such as applications and social systems. In order to allocate an ODA budget to the IT field, it is important to recognize that the innovation speed is significantly rapid in this field. This point is also important in aspects of related infrastructure. In the case of submarine cables, development by a consortium of communication carriers were normal, but currently, private cables are being introduced. When deciding the aid budget allocation to the terrestrial facilities linked to private cables, it takes half a year for the decision to be made. However, currently most decision-making is not proceeding smoothly. Furthermore, the speed of innovation in personal computers and other IT equipment is extremely rapid, and the value of this equipment changes every six months. In the case of ODA application to the IT field, the appraisal process and accounting system need to be modified. For example, it is necessary to declare that all appraisals conclude in three to six months.

In addition, it is necessary to support national education, systems and policy making. Thus, knowledge is more important than hardware, and more cooperation is needed with private sector IT personnel and NPOs.

(2) Aid by IT

Another characteristic of IT is that the services and the manufacturing processes with IT are drastically innovative. One example is manufacturing processes called the just-in-time production system which was designed to minimize inventory. This implies that standards should be established for improving services in terms of cost, quality and speed. In many projects, the administrative tasks of liaison and coordination require a work force, and so it is necessary to enhance efficiency in that work with IT. In that process, it is necessary to facilitate equipment to staff in developing countries and enhance IT capacity-building of staff in developing countries.

In construction works, it should be considered to facilitate the IT system which manages to monitor the working status of expensive construction equipment via satellite relay and to deliver necessary spare parts before breakdowns occur. It is useful for most Japanese construction machinery companies, from simple manufacturers to more advanced service companies, which are making efforts towards management innovation; thus, cooperation with private sector companies generates a cutting-edge approach.

Most Japanese manufacturing companies have considered the fact that it is difficult to keep their price competitiveness in the worldwide market by simple manufacturing, and they have aimed to integrate their business, including high technology products development and services. This situation is difficult for developing countries' IT development unless ODA plays the role of leading the change of industry structure.

In addition, the field of eODA application is expected to be a means of solving social problems in areas such as the environment and education.

(3) Aid with IT

In any countries there are inefficiencies due to vertical divisions between agencies. But, IT is something that is installed into the society rather than existing independently. Therefore a concept of IT development which relates to the other infrastructure is required. For example, the following are some important approaches to effective infrastructure development; optical fiber cable can be laid with road construction and combined with community telecenters, or the combination of cellular telephone equipment with hospital facilities can build highly efficient medical treatment systems. A successful case using this idea is reported as the Yangon Project, in which BHN[13], a Japanese NGO, built such a system in a hospital in Myanmar. In order to promote projects across barriers between agencies, there must be a change of direction in responding to request-base aid.

4.3 eODA PLATFORMS AND MULTILATERAL PROJECTS

Another characteristic of the IT field is that developing software is very costly, but once it has been developed, the cost of copying and distributing it is very low. Therefore the larger the market is, the more efficient the business is.

13 BHN stands for Basic Human Needs. The group provides aid to build telecommunications networks that support basic living needs.

While shifting the focus of ODA from the construction of hardware, such as dams and roads, to the softer aspects of education, software and content, this point will become extremely important. Bilateral relationships have hitherto been the accepted aid style, but in the IT age the relationships must change to cooperation within multilateral frameworks. Initiatives from the developing countries themselves are starting up, including the e-ASEAN initiative for progress in IT, which has been established by the ASEAN countries. Cooperation with initiatives, such as e-ASEAN is very important. Therefore, it is vital to move away from request-based aid.

As mentioned in the previous section, for promoting ODA with IT, it is necessary to facilitate data processing and communications systems. This includes logistical software and information sharing systems for ODA, as well as global communications systems to link them together. For mountainous areas and remote islands, infrastructure, such as use of satellites, WLL (Wireless Local Loop) systems and other wireless technologies are effective to support ODA. In particular, a satellite in a suitable position makes it easy to build a single system covering the whole range from East Asia to Central Asia.

Such data processing and communications systems should therefore be develop as common platforms for eODA work. Common systems imply both multiple countries and multiple projects. As mentioned earlier, in the IT age, various initiatives have been competing with each other. A shift to multinational projects and the development of effective platforms are essential for ODA projects in the IT age.

4.4 eODA COOPERATION

As mentioned above, the IT charter of the G8 calls for public-private coordination in efforts to bridge the digital divide. This is because the growth in information technology and its markets is led by the private sector, and the growth of the Internet has raised the importance of individual knowledge, and the entrepreneurial spirit of the world is getting attention.

The fall of communication costs is stimulating civil activity and it implies essential change for future society. It might be possible that the civil sector could force big companies and governments to move. Linkages between the people of developed and developing countries are tightening. That means that ODA needs to encourage public participation. In Japan, it is necessary that the accountability of the ODA budget must be increased, and the Japanese society must be more aware of participation in international society. In Japanese society, the 'baby boom generation' will start to retire. It must be considered how IT should work to get these knowledgeable and active older people involved in the field of ODA.

On the other hand, it is also important to buy goods and services from the developing countries. For example, we should buy software from India, help developing countries to create content and services, and then buy those services and content.

4.5 DEVELOPMENT OF NEW eODA TECHNOLOGY

Technological innovation and social change centering on the Internet has just begun. Japan leads the world in the development of technologies in new fields, such as the integration of cellular telephones with the Internet. Electronic commerce transaction at convenience stores is a new business model, which is suitable for Asian urban structures. Home data equipment has been developing for the non-PC age. Problems which Japan will face from now on, such as an ageing society with few children are generating new industries, such as robots in the welfare and environment fields. Japan is also starting to progress in the areas of deregulation for electronic commerce and systematic reform of the capital market, where it was lagging behind.

It is expected that Japan's vitality in these areas will create many technologies which are able to improve the digital divide in developing countries.

For example, research by the ITU Focus Group 7 has found that the wireless local loop systems using satellite communication is effective for communication system development in the rural areas of developing countries. The ITU's Multi-community Tele-center (MCT), which has already mentioned, is extremely effective, but it is also said that its cost will have to be reduced by a significant extent. In Japan development of the IC chips, which are necessary for household information equipment in the age of ubiquitous networks are proceeding, and their prices will drop to a few hundred Yen in the near future. These chips are, of course, being developed for the huge civil market, but they have the capacity to achieve remarkable improvements in data communications in developing countries. In addition, the high-speed Internet communication satellites, which are currently developed by Japan, and the stratosphere platforms which have been proposed as a Millenium project, also have the same possibilities. These are only examples, though, what I want to say now is that we

should recognize the strengths of Japanese society and aim to develop the systems to bridge the digital divide as one of the targets of Japan's technical development.

5. CONCLUSION

The world's economy is starting to surge forward, due to the progress of IT based on the Internet. The Internet provides our society with enormous opportunities. It is now possible for the people of developing countries to sell their ideas and we should respect these opportunities. On the other hand, division between regional economies caused by the evolution of global economy is also happening. In some regions, all the cotton flowers that are sent overseas result in the destruction of the economic activity of spinning thread and weaving cloth, which supported the livelihoods of the local people. Rather than a problem of IT itself, the problem is what kind of society do we want to create with our technology. Besides respecting the achievement from IT technology, it is also necessary for us how to overcome the digital divide, which is the negative side of IT development. Japan is trying to provide leadership and to have its own vision in this field. In this paper, eODA guidelines for bringing IT into ODA are recommended. In the Internet age, it is important to have clear vision and open debates between the various parties involved, and it is hoped this paper makes some contribution towards that end.

REFERENCES

'Towards Digital e-Quality' U.S. Government Working Group on Electric Commerce, Second Annual Report 1999

'Development Outreach Spring 2000' The World Bank Institute

M. Kusakabe (2000), 'Information Infrastructure Construction Strategy of the World Bank' ITU Journal Vol.30 No.8, August 2000 (Japan ITU Association)

K. Takahashi (1999), 'Tasks of International Development: Response to Globalization - 1999', International Development and Higher Education Institution

K. Saga (March 2000), 'Theory of Practical Telecommunication Policies' International Relations Research Works No.2', (Research Institute for International Relations, Asia University)

'World Telecommunication Development Report 1999', International Telecommunication Union

S. Kusuda (1999), 'The Future of Private Investments in the Developing Nations' Telecom Markets' Telecom 99

Official Residence of the Prime Minister of Japan (http://www.kantei.go.jp/)

Management and Coordination Agency (http://www.somucho.go.jp/)

US Department of Commerce (http://www.commerce.gov/)

US Department of Commerce, 'The Emerging Digital Economy' 1999

World Bank (http://www.worldbank.org/)