

COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY

NEW SOCIAL AND ECONOMIC APPROACHES TO A MULTIMEDIA WORLD

TOKYO, 6-7 MARCH 1996

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

This summary report was recommended to be made available to the public by the Information, Computer and Communications Policy (ICCP) Committee in March 1996.

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FINAL AGENDA

Introduction

The object of this Symposium was to support both the G-7 and OECD Ministerial goals of increasing economic growth and job creation through the growth of a Global Information Infrastructure/Global Information Society (GII-GIS). It did this by bringing together senior government, industry and academic representatives to identify the key commercial and policy issues which governments need to consider in order to encourage the development of new national and international markets for multimedia services. The OECD organised the symposium with the support of the Japanese Ministry of International Trade and Industry and Ministry of Posts and Telecommunications, and in co-operation with the Japanese Information Processing and Development Centre and Posts and Telecommunications International, Japan.

The Symposium extended over 2 days. It consisted of plenary sessions where leading experts from government, industry and academia focused on specific technological, commercial, and regulatory barriers to the development of multimedia services, as well as corporate and policy initiatives for overcoming these barriers and realising new market opportunities. These sessions were followed by roundtable panels, where these barriers and initiatives were strategically evaluated in terms of the commercial and regulatory requirements for optimising the growth of multimedia services in and amongst OECD countries. The outcome of the meeting is a clearer definition of the contribution of governments and the private sector to the development of a Global Information Infrastructure/Global Information Society, as well as of the role which the OECD can play in building a framework for co-operation over the coming years.

Agenda

Day 1: 6 March 1996

10.00 *Welcome and Introductory Remarks*

Chair: Shoichiro Asano, Professor, NACSIS and Vice-Chairman, ICCP Committee

Osamu Watanabe, Director General, Machinery and Information Industries Bureau, MITI

Norimasa Hasegawa, Director General, International Affairs Department, Minister's Secretariat, MPT

Pierre Vinde, Deputy Secretary-General, OECD

Jeremy Beale, Administrator, OECD Secretariat - Introduction of Symposium Issues and Procedure.

10.45 *Future Perspectives of Economic Growth, Trade in Services and Job Creation*

OECD countries view new multimedia services as a potential major area of economic growth and job creation. This session outlined the ways in which the development of multimedia services can contribute to economic growth, job creation and the enhancement of labour practices. The role which multimedia services can play in supporting increased national and international trade -- both in their own right and in support of trade in other goods and services -- was focused on in particular. In addition, the growth of small and medium sized enterprises as engines of growth was discussed, along with the flexible commercial and regulatory environment which their development requires.

Chair: Lars Jeding, Director General, Ministry of Finance, Sweden

Presentations:

Marium Schwartz, Senior Economist, Council of Economic Advisers, Executive Office of the President, United States

Nagaaki Ohyama, Professor, Tokyo Institute of Technology, Japan

Luc Soete, Director, MERIT, The Netherlands, and DSTI, OECD

14.30 *Technological, Investment and Content Options for Multimedia Services*

This session considered the new technologies being developed by private and public sector providers of multimedia services, the costs of investment involved and the new content innovations which different technological options allow. The lessons learned from existing trials and experiments in various OECD countries for producing, programming and formatting, and delivering content which new technologies allow in various business, residential and public service markets (such as healthcare and education) were considered. The corporate strategies which need to be developed in order to overcome technological and commercial barriers and to expand possible new service opportunities were highlighted.

Chair: Marium Schwartz, Senior Economist, Council of Economic Advisers, Executive Office of the President, United States

Presentations:

Tosiyasu L. Kunii, President and Professor, The University of Aizu, Japan

Horst Autzen, Prof. Ministry of Economics, Baden Wurtenburg, Germany (written contribution)

Arne Eriksson, Counsellor, Industry, Science, Technology and Energy, Delegation of Sweden to the OECD

Peter Bondar, Director, Acorn RISC Technologies, Acorn Group, United Kingdom

16.30 Roundtable Panel: *Perspectives for a Multimedia Society*

This roundtable reviewed the areas of major social and economic opportunity for the development of multimedia business, residential and public sector services, and evaluated the contribution of different technological, investment and content initiatives to the realisation of these opportunities. The panel addressed such questions as the following:

- Do product development strategies which focus investments only on upgrading existing delivery and access technologies fail to realise the full economic and social potential of multimedia services? To what extent are investments in radically new production and delivery technologies needed to optimise economic growth and social benefits?
- In what ways do the possibilities for the growth of multimedia services differ between business, residential and public sector markets?
- In what ways can small and medium sized enterprises respond to changing demand better than large scale ones, and in what ways are they more limited?
- In what ways are SMEs and large companies more or less able to optimise productivity and job creation in new multimedia services? In what ways are SMEs and large companies complementary to each other in the production and delivery of multimedia services?

Chair: Detlef Eckert, Advisor to the Director General, DG XIII, European Commission

Panelists:

Masanori Awata, President and Chief Executive Officer, Synergy Inc, Japan

Louis C. Golm, President, AT&T, Japan

Juhani Kuusi, Senior Vice President, Head of Research Centre, Nokia, Finland

Lars Jeding, Director General, Ministry of Finance, Sweden

Yoshinobu Tsuji, Director, Multimedia Policy Office, MITI, Japan

Day 2: 7 March 1996

9.30 Market Access and Development for Multimedia Services

This session investigated how the new service possibilities arising from innovations in production and distribution technologies need to be developed in terms of pricing, marketing and distribution in specific service markets. It considered how new pricing and marketing strategies which firms can implement in order to sell on-line and stand-alone multimedia services for different classes of business and residential consumer customers affect relations between content creators, wholesalers, retailers and consumers. In addition, it discussed how the markets for intellectual property in OECD countries are being transformed by the development of multimedia products.

Chair: Neil McMillan, Chair, WTO Negotiating Group on Basic Telecommunications Services, DTI, United Kingdom

Presentations:

Florian Lahnstein, Executive Vice President, Bertelsmann New Media, Germany (written contribution)

John G. McBride, Chief Representative, News Corporation and Regional Director, Star TV, Japan

Yasuo Sakamoto, Director, Consumer Consultation Office, Telecommunications Bureau, MPT, Japan

Steve Furney-Howe, Director, Planning and Development, Sun Microsystems, Japan

11.30 *Information Infrastructures and the Distribution of Multimedia Services*

This session focused on how governments can ensure efficient but equitable access to new multimedia services through the promotion of broadband information infrastructures. In particular, it considered how the vertical integration of production and delivery systems for multimedia services may limit social provision, and the policy frameworks which governments can develop in order to overcome national and international disparities in economic growth and social advancement. Promotion of universal access to multimedia services through national and international networks was considered, as well as how demand might be stimulated through government procurement and use and promotion of multimedia services experiments.

Chair: Dimitri Ypsilanti, Principal Administrator, Telecommunications and Information Service Policy, OECD

Presentations:

Neil McMillan, Chair, WTO Negotiating Group on Basic Telecommunications Services, DTI, United Kingdom

Seikichi Sakakibara, Executive Director, Association for Promotion of New Generation Network Services, Japan

Jung-Taik Oh, Team Leader, Telecommunications and Information Industry Research, Korea Information Society Development Institute, Korea

14.30 *Sectoral Convergence, Social Values and Regulatory Reform*

This session focused on the regulatory and policy reforms needed to remove barriers to multimedia service development and to release the potential social and economic rewards of new content possibilities. It considered the economic benefits from removing foreign and cross-media ownership restrictions which currently limit the potential expansion of multimedia services. In addition, the continued feasibility of applying traditional national broadcasting approaches to censoring and controlling content available over on-line services such as the Internet were discussed, and new approaches to promoting positive social values in entertainment and educational services were explored.

Chair: Professor Mark Armstrong, Chairman, Australian Broadcasting Corporation

Presentations:

Sandra Graham, Director, Broadcasting Policy Branch, Canadian Heritage, Canada

Dr. Alejandro Navarrete Torres, Director of Television, General Directorate of Broadcasting, Mexico

Dirk Max Johns, Head, International Programme Co-ordination, ZDF Television, Germany

16.30 Roundtable Panel: *Roles for Industry, Government and the OECD in the Coming Multimedia Society*

The panel reviewed the regulatory environment needed to stimulate the growth of multimedia services, and how this will affect traditional regulatory structures. The following questions were addressed:

- What is the value in regulating multimedia services as a single market, or is it necessary/preferable to have different regulations for different classes of service?
- In what ways and to what extent can governments control or determine the content of on-line services?

- In what ways do markets for intellectual property need to be reformed to encourage the growth of multimedia services?
- How can the work of the OECD ensure that the environment for service development is dynamic and sustainable of long-term economic growth and job creation?
- Is there a need for an internationally agreed regulatory framework for multimedia services?

Chair: Shumpei Kumon, Executive Director, Centre for Global Communications (GLOCOM), International University of Japan

Panelists:

Mark Armstrong, Chairman, Australian Broadcasting Corporation

Detlef Eckert, Advisor to the Director General, DG XIII, European Commission

Neil McMillan, Chair, WTO Negotiating Group on Basic Telecommunications Services, DTI, United Kingdom

Shumpei Kumon, Executive Director, Centre for Global Communications (GLOCOM), International University of Japan

Risaburo Nezu, Director, Directorate for Science, Technology and Industry, OECD

18.30 **Concluding Remarks**, Shoichiro Asano, Prof., NACSIS and Vice-Chair, ICCP Committee

Close

SUMMARY REPORT¹

Introduction

The object of the Symposium was to support both the G-7 and OECD Ministerial goals of increasing economic growth and job creation through the growth of a Global Information Infrastructure/Global Information Society (GII-GIS). It brought together senior government, industry and academic representatives to identify the key commercial and policy issues which governments need to consider in order to encourage the development of new national and international markets for multimedia services. The OECD organised the symposium with the support of the Japanese Ministry of International Trade and Industry and Ministry of Posts and Telecommunications, and in co-operation with the Japanese Information Processing and Development Centre and Posts and Telecommunications International, Japan.

The Symposium lasted 2 days and was attended by around 400 private and public sector representatives. It consisted of plenary sessions where leading experts from government, industry and academia focused on specific technological, commercial, and regulatory barriers to the development of multimedia services, as well as corporate and policy initiatives for overcoming these barriers and realising new market opportunities. These sessions were followed by roundtable panels, where these barriers and initiatives were strategically evaluated in terms of the commercial and regulatory requirements for optimising the growth of multimedia services in and amongst OECD countries. The meeting has resulted in a clearer definition of the contribution of governments and the private sector to the development of a Global Information Infrastructure/Global Information Society, as well as of the role which the OECD can play in building a framework for co-operation over the coming years.

Day One

The first session was opened by the Symposium Chairperson, **Shoichiro Asano**, Professor, National Centre for Science Information Systems and Vice-Chairman, ICCP Committee. Professor Asano noted how the groundwork for the development of multimedia services had been laid by the ICCP Committee through its work on information infrastructures and new services. But he noted that the work done to date was not sufficient for addressing all the issues raised by the convergence of technologies and the development of new multimedia applications and services. The Symposium was important in launching a new area of work for the ICCP Committee, and in providing a focused start for understanding the issues and building a better interaction between the private sector and governments nationally and internationally.

¹ This report represents an edited version of the recorded transcript of the meeting. While stylistic and minor wording changes have been made, there has been no introduction of arguments other than those made by the speakers themselves.

Professor Asano also noted that OECD had been conducting work on information infrastructures and multimedia services under a Ministerial mandate to look at the relationship between technology, productivity and job creation, following the G7 request at the 1993 Detroit Summit. The Japanese government had been a leading contributor in sponsoring this work, which was being carried out under the supervision of a joint committee made up of the OECD's Industry, Science and Technology Policy, and Information, Computer and Communications Policy committees. The Symposium was thus also an important outcome of this work.

Opening statements were made by representatives from the sponsoring Japanese ministries: **Mr Osamu Watanabe**, Director General, Machinery and Information Industries Bureau, MITI, and **Mr Norimasa Hasegawa**, Director General, International Affairs Department, MPT. The Japanese government was developing new forms of industrial policy to deal with the new information economy and society, and in particular policies for stimulating new demand in contrast to (but being pursued along with) its traditional emphasis on supply side measures. There were two types of policy measures on the demand side. First, stimulation and promotion of information in the public sector, especially in education, research and medical services, or in areas where the policies of the government can act as a catalyst of private sector demand. A committee headed by the Prime Minister, and with deputy chairmen from MPT and MITI, was considering various submissions from government departments. The second major area for demand creation was in the private sector, especially in the promotion of information in the industrial sector, at home and in society. EDI standardisation was the basis of promotion in this area. Twice last year, a supplementary budget for electronic commerce was granted and at the present moment a project to test and demonstrate the viability of technologies in this area is underway. More than ¥30 billion had been made available since the end of last year for two and a half years work with 350 businesses and enterprises, and with about 500 000 users.

On the supply side, there were three major areas of policy development. The first area was in the creation of strong de-regulation to ensure the growth of private sector vitality. Huge investments had already been made in the sector with the liberalisation of telecommunications and the increase in services which had subsequently occurred. Investments in the various branches now exceeded those made in many other sectors, including automobiles. The government was reviewing areas for possible further de-regulation and would issue a report on its findings by June next year. The second area of policy development was for basic technologies, such as the "fifth generation" and "real world" computing which had in the past been led by MITI. High capacity network technologies were now being jointly developed with the Ministry of Posts and Telecommunications. The third supply side policy was for reinforcing the telecommunications and information infrastructure, so that the industry could become tough and robust, with a particular emphasis on software development and the personnel capable of software development. ¥28 billion was invested last year in the area of creative software development with universities, national research institutes and young private sector researchers.

As well as demand and supply side policies, there was a need for overall "environmental" policies. The first and foremost was for security and protection of privacy and against computer viruses. The second was in the area of intellectual property, not only nationally but internationally: increased speed was necessary in this area to address international needs. The third was overall operation or interoperability, where standardisation was important for opening up interfaces. With these framework policies in place, by the year 2000, an information industry of ¥65 trillion would come to exist, which by 2020 would have grown to ¥123 trillion. By the year 2000, the added value of the sector would be around 5.5 per cent of total GDP of Japan, which is bigger than the bank or automobile industry, by 2010, it would be 7.5 per cent of GNP. The G7 and OECD would be important in ensuring the success of this project.

Pierre Vinde, Deputy Secretary-General, OECD, emphasised that the creation of new, high paid jobs was the key economic challenge facing OECD governments at the present time. G7 and OECD Ministers had asked the Secretariat to examine the relationship between the development of new technologies, the growth of economic productivity and the creation of new jobs in national economies. At the same time, Ministers realised that the development of information and communications technologies, and the convergence and multiplication of new networks and services were the critical keys to releasing the promises of a Global Information Infrastructure and Society. Multimedia services potentially enhanced many existing services across a range of economic sectors, and also enabled the creation of new service areas. They could be expected to qualitatively change traditional economic relations between firms, within firms, and to allow the emergence of new forms of social relations at the workplace and at home. Multimedia services would also have a quantitative impact on economic growth and job creation. International trade in virtually all services (as liberalised under the Uruguay Round) depended upon access to and use of electronic networks, and a decline in transport costs of international information and communications. It was vital for the growth of trade in services that the negotiations in the WTO reach a conclusion in the near future.

However, agreement at the WTO would be just the beginning of the widespread changes needed in market conditions and access to international communications. Trade rules needed to be complemented by national and international policies and regulatory frameworks in order to promote the production and trade of new multimedia-based services. OECD Member countries needed to initiate and engage in detailed discussion of the new media policies, forms of data collection, pre-negotiation debates, and even formal guidelines necessary for giving birth to a healthy Global Information Society. The OECD Secretariat had an important role in providing analysis and advice to Member countries on policy requirements, economic challenges, and potential obstacles they might face, as well as the possible means for overcoming these barriers. There were a number of areas where existing government policies, regulations, structures and actions inhibited the growth of promising new services. Existing OECD research and analysis showed that economic productivity, growth and job creation were clearly related to flexible product and labour market conditions, and agreement was needed on the reform of these areas to ensure that international information and communications markets remained open for future growth and social well-being.

The wide range of industries and interests affected by the development of multimedia services meant that the OECD had to take into account social and cultural considerations. Ministers had made it clear that service developments must not exacerbate existing or new social and economic inequalities at national and international levels, but had to be a force for improving social and economic opportunities. The unrestricted flow of new services available via the global information infrastructure also should not undermine positive social values of human decency and dignity, or stunt pluralism through excessive market dominance, but should strengthen community values and caring social relations. The OECD thus still had a number of important and contentious issues to address. In doing so, it was important that the Secretariat identify a consensus which would take into account the full range of interests at stake, as well as ways to move consensus forward. In this way, agreements which were reached would be sustainable and effective in other institutional fora on a long term basis.

Future Perspectives of Economic Growth, Trade in Services and Job Creation

The aim of this session was to outline the broad strategic considerations for the development of multimedia services in the United States, Japan and the European Community, and to identify how they

can contribute -- both in their own right and in support of trade in other goods and services -- to economic growth, international trade, job creation and social welfare.

Marius Schwartz, Senior Economist, Council of Economic Advisers, Executive Office of the President, stressed that in order to capture the full power of multimedia, two things were needed. The first was cheap, powerful computers, which we already almost have. Computer power has been increasing dramatically and computer prices have been falling. Computer power doubles every 18 months. The second ingredient needed is cheap, fast and flexible transmission networks, and this is still missing. In particular, telephone lines into which one plugs one's computer are pretty much the same as those which existed ten years ago, and prices have not fallen very much in most countries. When you compare this with what has happened in the competitive and largely unregulated computer industry, the contrast is really striking. The United States believed the solution was through effective competition, which means removing artificial government barriers and artificial private barriers. The government had a role in ensuring interconnection at reasonable rates, in ensuring the unbundling of charges for network components, and in enforcing anti-trust or competition rules.

In the United States expanding bandwidth was allowing development of a range of new services. The first example was Internet access. There were now 25 million Internet users in the U.S. In the World Wide Web part of the Internet -- the graphical portion -- the number of users in the U.S. had been doubling every 55 days or so since last summer. A second example might be video-conferencing. The industry seems to have reached agreement on interoperability, compatibility issues, and between 1994 and 1995 the number of video-conferencing units sold in the U.S. has almost tripled. These developments have been driven by technological convergence. Video-conferencing is an example of this. For a long time people tried to implement it through television. Now it is catching on because it is being done through computers: this is reducing the cost and making it a commercially viable product. But technological progress by itself is not enough: it is also necessary to have regulatory reform.

Much of existing telecommunications regulation was premised on the belief that certain services such as local telephone and cable service were *natural monopolies*. The theory was that these industries had such high fixed costs that to have competition between multiple providers was either not possible or, if possible, was not efficient because fixed costs would be duplicated. As a result of this view of the world, two types of regulation were necessary. First, regulation was necessary of entry into what were considered natural monopoly markets. Second, regulations were necessary to prevent those firms in monopoly markets from entering competitive markets where they might use their monopoly profits to gain unfair advantage against competitors. Allowing a firm to enter related markets while it remained price-regulated in its monopoly market could enable it to circumvent regulation by (a) cross-subsidising its unregulated operations and, more importantly, (b) discriminating against competitors in unregulated markets in the access terms it granted to its monopolised bottleneck facility (e.g. elements of a local telephone network). Such behaviour led to higher prices in the regulated markets (if cross-subsidies occurred), and inefficient distortion of competition in the potentially competitive markets, harming both rivals and consumers.

There is a growing consensus that this system needs reforming. There are two reasons for this consensus. The first is a growing awareness of the costs of regulation; the second is a result of the dramatic technological changes which made competition more possible and desirable. In terms of the costs of regulation, even if competition is not perfect, regulation of monopolies is far from perfect. There are few incentives for firms to reduce costs and improve efficiencies, there are administrative costs both for the

government and the firms having to comply with the regulations, and prices and investments become rigid and unresponsive to changing conditions because firms have to get permission to change.

Technological change has done two things. First, it has challenged the view that these industries are natural monopolies by reducing fixed costs of providing a service, e.g. wireless technologies might offer a lower cost way than cables to reach a customer's premises. It could also reduce fixed costs by enabling the same facilities to supply additional services at a lower extra cost than if supplying the additional service alone, e.g. by reconfiguring phone or cable lines so each can supply both services. Such changes also introduced hybrid services that did not fall neatly into any traditional "industry," e.g. video conferencing, multimedia, and data transmission. Second, technological change has tended to blur industry boundaries, making competition possible between providers of traditionally different services. Attempts to preserve artificial industry definitions in order to maintain regulation under traditional monopoly franchises then become arbitrary and counterproductive in that they restrict the scope of firms activities.

The U.S. view is that government should not try to judge the direction of technology. It is particularly difficult to do this in a rapidly changing field. Several years ago interactive video-on-demand, home shopping, and so on, were considered to be an exciting new area full of commercial possibilities. Many U.S. companies bet a lot of money on these things and lost a lot of money. It might be said that this shows the market also does not know, and that is certainly true -- no-one really knows where all this is going. But when private companies invest their own dollars, there is usually a better chance they will have good incentives to figure out the right answer than when companies are largely playing with other people's money, as in the case of private monopolies that are regulated on the basis of cost-of-service or in the case of publicly-owned companies.

Government has an important role in developing a pro-competitive regulatory framework. The Telecommunications Act removes all state and local laws and regulations that unduly prevent competition. For instance, most local monopoly cable TV or telecommunications franchises are illegal, though there are a few exceptions for rural areas. Any kind of state or local government action to impede competition, whether through laws or through discriminatory access to rights-of-way are illegal. Second, the Act allows the Bell companies back into the activities -- long distance and equipment manufacturing -- they were prevented from entering by the 1982 Court Order breaking up AT&T. Finally, the Act also allows telephone companies into video programming while owning the cable companies. This goes hand-in-hand with increased flexibility in licensing of wireless spectrum. A checklist of safeguards concerning interconnection and unbundling have to be met and approved by the FCC in consultation with the Justice Department.

Restrictions on foreign investment are also being removed: the criteria for allowing this are now transparent and based on the competitive environment in the other country concerned rather than anything else. Second, restrictions on the number of foreign directors and officers in a company or holding company that owns a wireless or radio license. Subject to FCC approval based on competition criteria, foreigners can hold up to 100 per cent of a holding company with an interest in a company. These measures have allowed the U.S. to offer to open all its basic communications markets in the WTO if it gets enough other countries to do likewise.

The Administration has taken a strong line on restricting media cross-ownership. There has traditionally been a prohibition on owning broadcasting facilities and newspapers in the U.S. Some economists argue that a prohibition is unnecessary if market share is low enough. However, say if there are a thousand radio stations, a thousand TV stations, and a thousand newspapers, and one thousand owners holding one of each. In this case concentration is very low. But what if there is an issue to be debated that affects one of these media sectors? For instance, there has been a debate over whether to give spectrum free to TV station owners so that they can broadcast in digital form, which some people oppose on the grounds that the spectrum should be auctioned. At the moment the TV stations are remarkably quiet on this; the newspapers are quite vocal. But what would happen in a world where both media are owned by the same people? The new Act did relax somewhat the number of newspapers and radio or TV stations one entity could own, but maintained the prohibition against joint ownership of newspapers and broadcasting.

Nagaaki Ohyama, Professor, Tokyo Institute of Technology, Japan noted that in response to the proposal for a GII (Global Information Infrastructure) made by the vice president of the USA in March 1994, the Japanese government completed and issued "a fundamental policy towards a new society supported by information and communication technologies" in February 1995. In this policy it was stated that the Japanese government would construct a NII (National Information Infrastructure) by the year 2010 and lead the development of advanced applications in public fields such as education, medicine etc.

In August 1994, the "Advanced Information and Communication Society Promotion Headquarters" was established and headed by the Prime Minister with representatives of each Ministry. This headquarters established various other bodies, such as a committee of intellectuals to consider the issues at stake. In February 1995, a set of fundamental policy guidelines were issued. The basic concept is that government will determine what kind of information system should be promoted, that there should be a review of institutions and social systems, that a national fibre-optic network should be built, and that information and communications should be advanced as a global concept: co-operation should be promoted at all levels, including internationally. In August 1995, a working party for the review of existing institutions was established. The first item to be discussed by the working party is how to deal with the electronic storage of documents for tax or medical purposes which are required by law. The second item is how to deal with reports and applications which are to be transferred by electronic media. There are technological as well as legal difficulties involved in addressing these issues.

The information industry in Japan exhibits several defining characteristics to date. First, CD-ROM versions of multimedia titles support the development of the content industry, mainly in games software where Japan has been a world leader. Second, there is also a trend towards more open systems, in order to reduce the costs of computer systems and to improve interoperability of software. But there is a gap between these two aspects. The inherent value of multimedia must be considered: what needs to be made open is not just software but information itself. Third, the Internet is becoming increasingly popular in Japan; it has created a kind of community that has never existed before but has been made possible by directional information exchange, and this is one of the greatest contributions of the Internet through giving people new channels of communication through which to express themselves. Fourth, computer "allergy" is being reduced, mainly as a result of computer games.

But it is important to pay attention to the contents of multimedia in the information society. Many kinds of multimedia service are being built, but the objective of this development is to make our lives more comfortable to live. Content is now bound by hardware and software. The formatting of this hardware and

software may prevent the dissemination of the content to those who most need it. Content is not necessarily commercial: medical information or data, for example, is not usually commercial. Data should be independent of hardware or software. This will help us to expand personal and social activities, and to create an environment which escapes the confines of time and space and allows new businesses and services to be more easily created.

Although information systems are expected to strongly influence the business environment, it is difficult to estimate their precise impact in Japan. Two basic points, however, can be made. First, information systems could extend the professional's role in industry as more elaborate systems developers or systems integrators rather than basic programmers are increasingly required. Second, because of the life-time employment tradition in Japan, businesses are able to flexibly respond to demands for change and to develop new business opportunities.

Unless new applications are harmonised with custom and cultures, they are unlikely to be developed successfully for a wide spectrum of services. Applications have to be easily understood by the general public, and this is facilitated in Japan by the government's preparedness to develop advanced applications. The diffusion of new technologies will change the environment, and in turn change culture and custom. But technologies first need to be adapted to particular social and cultural contexts, rather expecting regulatory systems to be first changed to meet technological changes. An example might be in the case of medical records, where different regulations apply to how they need to be stored in Japan, the United States and France in case of legal proceedings. In Japan, it is the responsibility of the hospital, in the U.S. it is the doctor, and in France it has to be the medical institution though the individual can hold their own images upon request. A positive example, though, might be the electronic smartcard which is similar to the Japanese "inkan" or seal, by which an individual may authorise transactions (or authorise a third party to do so using the seal) in place of written signatures which always require the individual's presence. In the Japanese perspective, if multimedia applications are to be successful they have to naturally evolve into the social system rather than being forced in. At the same time they can reduce social costs and raise productivity.

Luc Soete, Director, MERIT, The Netherlands, noted that the concept of an information society followed on from an earlier debate on the "post-industrial" society, and its emphasis on the declining role of manufactured goods in economic development. He thought it vital that discussion return to the roots of this earlier debate, and emphasised the ways in which new communications networks and information technologies had diametrically opposed impacts on material and immaterial goods. This was particularly acute in the case of services which deal with communications and those which are bound by the fact that they are consumed when they are produced. This is because there are basically two types of services: those for handling material goods and to make sure they are transported, distributed, and delivered, etc., and those services where the content of the service is physical content and interaction, as a result of which these services have been bound by the proximity or immediacy of consumption and production. Information and communications technologies allow for a de-coupling of production and consumption in this large group of services which have been restricted in their tradability because of the immediacy or similarity between production and consumption.

The introduction of this time or storage element is behind the enormous tradability possibilities of information technologies and the various services associated with them, and in particular multimedia services. Add to this the communications element and you have an additional geographical possibility

which, when combined with the time and storage elements, have led to the enormous explosion of growth possibilities in this area. The result of these changes is phenomenal, as many of these services were behind the previous productivity slowdown and decline in most of the OECD economies because it was in these activities (education, health, entertainment, etc.) that productivity growth was limited by their intrinsic nature. They were the growth sectors in terms of employment, but the laggard sectors in terms of productivity performance and in terms of generating and responding to new requirements on the demand side.

In terms of material goods, one could argue that the impact of information and communications technologies has been exactly the opposite. They bring consumption back much nearer to production and reduce inventory costs and costs of transitions from the initial material inputs to the final consumption good and realisation of value-added over the production process. In looking at these two processes one could argue that there is convergence between the characteristics of services and manufacturing production processes: services are getting characteristics which were typical for material goods, while material goods are becoming much more immediate in terms of responding more closely to consumption and time is becoming a much more crucial factor in material production. The opposite of this convergence is that, in geographical terms, information and communications technologies are making services much more internationally tradable, while for manufactured goods it is becoming increasingly necessary to be geographically located near to customers. This could explain the dramatic increases in foreign investment which we are seeing at the moment.

But convergence also means that services are becoming the driving force of economic growth in most economies. The importance of services and manufacturing in economic activity with respect to industrial competitiveness has been misunderstood by many recent reports in Japan and the European Union. These reports have tended to reduce the importance of services to being totally dependent upon the dynamism of the manufacturing sector. As a result, the growth of high-tech services is portrayed as primarily an activity which used to be carried out internally within manufacturing, but which is now being outsourced as a result of the dynamism and reorganisation of the manufacturing sector, while the growth of low-tech services is portrayed as simply a reservoir for manufacturing of employment or job creation for low skilled workers in the personal sphere.

However, the move towards a post-industrial society as the dominant trend in the formation of an information society, and the convergence of production processes in manufacturing and services occurring through information and communications technologies, fundamentally undermine these arguments. This is particularly pertinent in respect to what has been called the “codification” or “embodiment” of knowledge in material or service goods. This codification of knowledge can be clearly seen in the dramatic growth of industrial goods which have to some extent replaced a large number of service activities in the post-War period. This has been called the industrialisation of services: the washing machine in the household, the dryer in the household, the dishwasher in the household, the television replacing the service activity of going out and watching a movie, etc. In all of these examples, the performance of a machine is continuously increased via the introduction of information and communications technologies which to some extent codify a set of knowledge, and thereby free the time which was otherwise taken up by people having to do this activity without technologies and machines.

In material goods, the codification of knowledge has often been completed. The technology might still be difficult to use, but that is often a question of user-friendliness. But that is still a technological issue, in

that the user-friendliness of the technology has not yet developed sufficiently; but in principle the codification of knowledge in these material goods is complete. It is also irreversible: there will be very few people who will start washing their laundry rather than use a washing machine.

In services, though, you find totally the opposite pattern. You find the attempt at codifying knowledge in the sense of bringing in information, accessing it, and allowing everybody to access it in the typical example of the Internet. But the tacit knowledge -- the knowledge about how to use that information -- is still absolutely essential. The skills and the way you interpret the information are absolutely essential in developing knowledge out of information and indeed in providing a service with content.

What you find as a result of this difference between manufacturing and services is that the value of material goods is constantly being eroded. Computers represented 5 per cent of GDP in 1987; they represent 5 per cent today. This is because the value of computers continues to decline as further technologies are introduced and further increase performance at the same time as the codification of knowledge makes them more cheaply available. This is the fundamental paradox of the knowledge-based economy, and it illustrates why content and the value of the content of the tacit part of knowledge is constantly growing and increasingly moving into the service sector. What we are seeing today is indeed that manufacturing firms in the electronics sector or in the consumer sector are desperate to get into the content providing sectors. As a result, our value concepts must change from a material goods notion towards one in which the information content and the way it can lead to increased knowledge -- to increased content of what is being exchanged -- becomes the real value and is what people are prepared to pay for.

In terms of policy challenges, this development implies that services are fundamentally dependent upon the regulatory framework. The growth of services and of new services as a result of technological development is crucially dependent upon a change in the regulatory framework. As well as the importance of de-regulation in the telecommunications (or supply) side, there is a tremendous need to discuss de-regulation and re-regulation problems on the demand or content side, as that is where future value-added will be created and where the needs will be and where the regulations are probably the most difficult at the moment: in education, health, culture and the whole range of activities where society defines content in terms of what people value in their lives. If the demand side is not addressed, the gains will quickly fade away as there will simply be continuing price pressure on making communications cheaper, on adding television channels, on adding possibilities, trying technologies and markets, rather than the opposite way around. The important question here is what the demand side is in respect to technological possibilities. It is these sorts of questions which need to be generally discussed in terms of regulatory frameworks. It has to date been largely business demand which has been the driver, and this has been very much dependent on highly specialised technologies. What has been missing are consumer technologies, where the services are intrinsically time consuming. It may be that reductions in working time should be considered less in terms of problems in the labour market, and more in terms of finding solutions to consumption problems and to the lack of consumption with respect to these new services.

Finally there is the issue of the footlooseness of services, which relates to the increased possibilities for trade. To some extent it is in the nature of immaterial goods that the place where they are produced and exchanged is becoming relatively immaterial, and it is within the logic of this perspective that services could provide the engine for international convergence and catching up, as these services provide all the features of rapid imitation, catching up and erosion of certain knowledge rents as they might have existed

in OECD countries in the past. To some extent, evidence of this can already be found in the data, where the explosion in trade in services seems to explain differences in performance between OECD countries and in their trade imbalances. To some extent, therefore, international trade in services could become the logical engine of future economic growth, and to some extent this should be welcomed in terms of the contribution of reduced transport costs towards sustainable development.

But of particular importance to Europeans is the question of social cohesion, as inequalities in knowledge are perhaps even more difficult to redress than material ones and involve generations of investment in educationally deprived social groups. Perhaps it is worth considering the value of some tax on digital bit traffic as a means for addressing this issue? There are three arguments for such a tax. First, the national tax base of governments is being dramatically eroded, primarily because they have a national base or secondly a material base. In telecommunications today, for example, you could argue that the whole Value Added Tax (VAT) system is being undermined by globalisation, and governments may have to admit that there is a large part of the economic system which is not being measured. Second, there is the question of unfair competition: international transfer of material goods is liable to VAT, but if sent in electronic bits it is not. Third, there is the question of whether the whole intellectual property regime of the future information society can be maintained on the basis of present principles. How do you identify the real content provider in a future information society which is totally based on interaction and highly focused markets? The concept of intellectual property might be too based on material concepts of goods. A bit tax might provide an interesting alternative concept in which the transfer of this sort of information provides the resources for reinvestment back into the various creative content providers in each of the different countries between which the transfer is taking place. This system would thus reduce the risk that the contents of the future information society might all be done in one country or region.

Technological, Investment and Content Options for Multimedia Services

The session considered the new technologies being developed by private and public sector providers of multimedia services, the costs of investment involved and the new content innovations which different technological options allow. The corporate strategies which need to be developed in order to overcome technological and commercial barriers and to expand possible new service opportunities were highlighted.

Tosiyasu L. Kunii, President and Professor, The University of Aizu, Japan, noted that information had in the past been passively used, but that it was becoming increasingly possible to use information in an active way in a growing number of areas as a result of technological developments in multimedia. Little research existed on how to activate multimedia information in different contexts -- manufacturing, education, and sport. By mapping the real world using multimedia techniques one could save energy and time in the accomplishment of tasks, and dramatically raise efficiency.

Arne Eriksson, Counsellor, Industry, Science, Technology and Energy, Delegation of Sweden to the OECD, noted that, though Sweden had a small population within a large geographic area, there was a large number of international companies and thus a significant demand for multimedia business applications. Demand was highly decentralised, communications markets were now very competitive, and there was a rapidly increasing penetration for Internet connections. But he raised the question of how to achieve the level of investment required to ensure that applications development became general and achieved economy-wide effects rather than just producing sectoral benefits. He pointed out the difficulties of

regulating a market and defining such things as an expanded concept of universal service when “the nature of the beast” was still unknown because of the pace of technological development. But local government development of services such as EDI could help small and medium sized businesses, while testbeds could identify and stimulate the development of larger scale applications. This was not so much a matter of government leading development -- as many large corporations had already implemented electronic commerce -- but of extending the benefits of these technologies more broadly in society by providing a critical mass of demand and social development.

The present market domination of information technologies by a couple of private enterprises was emphasised by **Peter Bondar**, Director, Acorn RISC Technologies, Acorn Group, United Kingdom. But he noted how markets were constantly being recreated in information technologies, and that the rapid growth of the Internet held open the possibility that the present dominant position of PCs might become as antiquated as was that of mainframes and minicomputers nowadays. He argued that alternatives needed to be attempted given the still-low penetration of PCs. Television was more pervasive, but trials of set-top boxes had not produced the results originally hoped for. Low cost, high-powered network terminals were capable of providing consumers with access to services on a par with -- if not surpassing -- those available on PCs, and particularly in emerging markets and Japan. The growth of the Internet was critical for this development, and governments could play a key role in ensuring a competitive, low-cost communications environment.

Perspectives for a Multimedia Society

The roundtable reviewed the areas of major social and economic opportunity for the development of multimedia business, residential and public sector services, and evaluated the contribution of different technological, investment and content initiatives to the realisation of these opportunities. The panel focused in particular on product development strategies and the possibilities the growth of multimedia services offered different business, residential and public sector markets, and the investment strategies which should differ between these groups.

Masanori Awata, President and Chief Executive Officer, Synergy Inc., Japan, focused on the possibilities opened by multimedia technologies for content-creation and co-operation activities by artists. He also pointed out the increase in distribution outlets which multimedia allowed. However, he underlined the complexities which occur in copyright ownership with multimedia productions, and outlined a joint venture for a multimedia artists collaboration fund between his small production company and the finance affiliate of Nomura Securities (where copyright remained in the hands of the developer while the CD-ROMs are produced and commercialised) as representative of the new kinds of funding mechanisms vital for a new multimedia age to begin.

Louis C. Golm, President, AT&T, Japan, noted the difficulties his company had had in identifying ways to translate the promise of multimedia into commercial realities, but he thought the promise was now near realisation as a result of the growth of the Internet and the access to resources which it allowed as a support for businesses. There were three aspects of this: (1) content was increasingly available in massive amounts; (2) the cost of communications was dropping dramatically; (3) important business models were being introduced to quickly use the Net to serve customers in unique new ways. Multimedia communications were thus becoming increasingly available, affordable and valuable and would stimulate economic growth and global unity, as well as important social benefits in the form of telecommuting and distance learning. He suggested that the vertical integration of production and delivery systems could

limit multimedia service provision but that the intense pressures on communications companies such as AT&T to rationalise their operations in order to stay competitive was forcing them to focus their operations on what they did best. But he argued that the upgrading of existing systems was a more reliable competitive response than grand leaps forward into untried technological waters: experiments in interactive TV had provided technical solutions but were a long way from commercial demand; the Internet, though, was now commercial on lower bandwidth. Interactive TV also required a whole new technology and for consumers to adapt to this technology, by contrast the Internet is largely based on existing technologies with which consumers are already relatively familiar.

But different rates of growth could be expected for such services from residential, business and public sector markets, though the sectors are related and can help each other in their growth. For example, home-based growth is growing rapidly in the United States, both for those working for large corporations and those working for themselves. These people can become global providers. Businesses are looking at these services as a strategic investment to give them an advantage in relation to the next business. That speeds development to the consumer market: businesses are improving customer service and moving closer to the customer. The increased familiarity of consumers with the technologies, and the increased ease of use of the technologies, encourages their greater use in interaction between citizens and governments.

Large and small businesses will be important to developing these services. Large enterprises will be necessary for the quality, breadth, timeliness and viability of the products and services they can offer, and the infrastructure project investments will require the scope and skill of large enterprises. They will also be vital for the R&D in new service development. But small enterprises will be increasingly viable and able to use their speed to satisfy niche opportunities. This meant that internal control of corporations was much more difficult, and this changed the role of leadership within the corporation.

Juhani Kuusi, Senior Vice President, Head of Research Centre, Nokia, Finland, noted both the possibilities and complexities faced by companies developing broadband multimedia applications. Radically new forms of production were needed. But much could be made (and was being made) of existing links in the multimedia value chain between service providers and equipment manufacturers, especially when the chain was utilised as a whole. Ultimately, it had to be the demands of the customer which determined what services were developed and he stressed the need for open interfaces and interoperability in order for service development to meet customer needs. Governments had to avoid using national standard setting as a barrier to products and services from other countries; the international framework of institutions for common standards was vital in ensuring open markets.

In order to boost the development and utilisation of the multimedia value chain, R&D programmes and field trial had been launched. In Finland, leading media houses, tele-operators and telecommunications manufacturers had at the end of 1994 formed a consortium and launched several three year projects, including provision of business information, education material and news programmes (including audio-visual services) to 400 000 subscribers (8 per cent of the population) over the Internet. The dialogue between end users, service providers, telecommunications operators and manufacturers was extremely useful in establishing requirements for such things as new forms of payment and digital cash, and had been stimulated by the liberalisation of the Finnish telecommunications market as Finnish media houses used highly advanced technologies.

These trials indicated that technology was not the barrier to service development. The existence of a large telecommunications manufacturer such as Nokia helped, but SMEs were also important in the field, and large and small firms were complementary in developing differing business and consumer markets. Electronic commerce was important in extending services for consumers, while business services had been growing silently for a long time, especially in large companies. Electronic multimedia interfaces and

processes stimulated this process by making use quicker, easier and more natural, and particularly facilitated the expansion of educational services with interactive pupil/teacher environments and immediate assessment of long distance learning. This created potentially large new markets. But an aggressive, liberal environment was required to stimulate service development, and evidence from Finland suggested that such an environment increased the number of jobs available even while the rest of the economy was in recession. Restructuring was more than compensated for by a boom in the equipment industry which had a long tradition of competition in domestic markets. As particularly young people learnt to use the technologies, demand would increase significantly.

Lars Jeding, Director General, Ministry of Finance, Sweden, suggested that technological developments had occurred before there were mass markets. This had occurred in the past with computers. What were the applications which were going to result in the growth of business and consumer markets, as the light bulb had done for electricity? Very few jobs would occur in transmission and operating as a result of digitisation, but applications such as digital TV (which were much more efficient than analogue TV) opened up a lot of opportunities. But in a small country like Sweden with only 3.9 million households, the market would not simply drive the development of killer applications: a number of developments would be at play in introducing new opportunities. Training and education -- which had changed little since the times of the Greeks -- offered great possibilities for the development of new techniques. But it would not be driven by the market. Government initiatives were needed to develop the multimedia market.

Yoshinobu Tsuji, Director, Multimedia Policy Office, MITI, Japan, noted that Japanese companies had been restructuring in terms of reducing personnel rather than re-engineering through upgrading efficiency by using information equipment and services. Last year 5 million PCs were sold and most of these were used to build groupware and intranets in Japanese firms. Traditionally investments in new technologies had been made at times of economic growth, but this was now changing. Companies were now making strategic investments at a time of economic recession, and this was holding down the reporting of profits in company accounts. Given these new investments, what kind of new structures could be developed?

In the public sector, attention was being focused on education, medical and welfare applications, particularly in medical areas where the large amounts of image data required for scanning, etc. provided great opportunities for multimedia: in one to two years commercialisation could be expected from trials presently underway, and mass markets would begin to develop. PCs were being enthusiastically introduced into schools by the Education Ministry: there was a penetration rate of 77.7 per cent of elementary schools (6.1 units per school); 99.4 per cent of junior high schools (23.1 units per school); 100 per cent of senior high schools (57.6 per school). MITI had selected 100 schools which were being prepared for Internet access. Educational CD-ROMs were increasing, but there were limited numbers of titles in Japanese and this was a potential growth sector.

In the household sector, digital videodiscs (DVDs) and flat screen TVs were expected soon, but applications development was being delayed by questions of standards. Concepts of home information electronic appliances were being discussed, provided by such things as TVs with CD-ROM drives or Internet access via TVs. But these concepts are not firmly established yet. Internet penetration into households was being held back by concerns over decency issues, as discussed in the USA. SMEs usually used CD-ROMs to sell new applications for niche market opportunities, based upon game-like approaches, while large firms (software firms often in conjunction with well-known reputable retailers) used Internet to provide customers with access to cyber-malls. Game software is already a big household market worth ¥600 billion. However, standards were proprietary and prevented interoperability; there was also intense competition for software developers. Companies such as Nintendo were now outsourcing production of their games platforms to large manufacturing firms. Small firms were better than large firms at adjusting

to changing needs in the field of multimedia and were active in developing niche markets; large firms were waiting to see what market opportunities would develop and were more bound by traditional commercial practices. The Japanese government was attempting to stimulate the use of electronic commerce systems as a means of facilitating productivity in order to enable firms to meet the increasingly competitive market relations which deregulation policies were introducing.

Day Two

Market Access and Development for Multimedia Services

The session investigated how new service possibilities arise from innovations in production and distribution technologies. It considered new pricing and marketing strategies which firms can implement using on-line multimedia services for different classes of business and residential customers.

John G. McBride, Chief Representative, News Corporation and Regional Director, Star TV, Japan, emphasised the need to develop local talent and respond to local tastes as the way to develop international service development. He argued that the 500 channel market was a myth. There was not an interest or demand for a huge range of diverse programming, but rather for the four staples of sport, music, movies and general entertainment oriented towards local markets. More than 22 million viewers were now reached in the region. Star was focusing on improving quality and gaining access to the physical means of delivering services to customers. With the launch of Asiasat 2 in November 1995, Star was increasingly able to target customised packages of services to subscribers wherever they lived in a total population of 3 billion people, 2 billion of whom are under 30 and who collectively represent the world's largest growing consumer class.

Flexibility is vital. In order to best deliver services to Star's customers or cable partners, it would have to continue transmitting analogue as well as digital programming for the foreseeable future. Distribution systems also vary widely, while some are entirely direct-to-home, and others a combination of the two. Broadcasting from a variety of satellites is also necessary. Sensitivity is also required. All research and customer feedback tells us that local programming is the driver for subscription services. Strong local partners with country-specific expertise are invaluable. More and more, Star's services are conceived, created and conveyed within the territories they serve, and the company has decentralised management operations in order to meet this requirement. But market platforms needed to be standardised, and reliable and detailed information on consumer habits made available if international expertise was to be employed to maximum effect. Finally, governments in the region needed to ease regulations on foreign investors as well as general market structures.

Yasuo Sakamoto, Director, Consumer Consultation Office, Telecommunications Bureau, MPT, Japan, outlined the regulatory framework which the Japanese government had implemented in the field of communications. More than 120 facility providers existed, and there were over 2 800 non-facility-based providers. Japan, he argued, has one of the most competitive markets in the world, with declining rates and more varied services. The government was moving to make the market even more dynamic. For the promotion of multimedia, competition and de-regulation were important. Japan supported liberalisation of basic telecommunications currently being negotiated in the WTO.

But the rates system was the key to the development of multimedia services. The government wanted to see diversification of markets in order to activate all kinds of businesses utilising broadband audio, visual and data networks. Rates in telephony were restricted by time and distance, but if the same system was applied in multimedia costs would be prohibitive and it would impede the promotion of multimedia. The Japanese people get around four and a quarter hours of information and entertainment per day from a wide variety of sources, including television and radio. If the telecommunications rates system was applied, this would cost them ¥97 000 per month. Three things are needed: rates for communications need to be low in proportion to data, varied by service quality (such as real versus delayed time delivery), and need to be low compared with other packaged media (particularly in the early period of service development).

What are the measures needed to change the cost structure underlying rates? No-one can exactly predict the development of multimedia, but if telephony and multimedia services coexist for some time, network utilisation will increase and traffic sensitive and distance costs will decline. Creating such a benign cycle early is important to improve diversification of start-ups in market provision. Second, rates should reflect costs in line with technological innovation and demand, such as moving from a metered to fixed rates system. Third, there should be impartiality in the treatment of telephone and multimedia service users. Fourth, as competition intensifies, it is important to create a fair system of regulation for providers. This will be particularly reflected in inter-connection rates and un-bundling of services.

Steve Furney-Howe, Director, Planning and Development, Sun Microsystems, Japan, suggested that network developments would greatly improve productivity and economic growth if technologies were developed which enabled services to adapt to the needs of users rather than requiring users to adapt to services. Information architectures were vital for this purpose. More innovation always occurs outside one's own organisation than within it: Sun was developing open technologies which would allow people access to such external innovation wherever it may occur. The idea is that people should compete on their innovative applications and content, not on their control of interfaces.

How does multimedia add value to a company? With the way people are working, necessary information will come from a variety of different places. Where, and when, it is needed will differ. These needs are driving network computing. The design centre of services has shifted from a stand-alone, personal desktop-centric kind of world to a physical or virtual network. Most investments today are not going towards companies claiming to have the next best personal computer technology, but towards network-centric applications. Multimedia is shifting from local or individual multimedia to interactive, network-based audio, graphics and data types.

Japan and developing countries in Asia are approaching this situation from a relatively clean position. In the United States, 80 per cent of corporate desktop computers are networked together in PC LANs in some way. In Japan, this figure is much smaller, perhaps around 20 to 25 per cent. The opportunity that presents is to avoid the mistakes made in the U.S. and to take advantage of the technology available today without having to deal with the problems of having to integrate it with all the technologies which have evolved over time. Basically, these previous technologies were low bandwidth, very general purpose and designed simply to transfer data around with a company. The Internet has allowed more data to be transferred around -- not longer text files, but different kinds of data like graphics, audio and video, and allowing the practical use of multimedia. The increase in bandwidth has driven the requirement for specialised applications servers, and made possible improvements in computer hardware processing for such applications as visual instruction sets for handling video formats in a much more cost-effective way.

. The bandwidth needed to develop multimedia applications only really exists today in corporations where people are developing internal multimedia applications to manage such things as general administration, expense travel forms, information about healthcare plans. Java is a network centric computer programme which will advance this process by allowing developers to create a programme once and to be able to run it again anywhere. Previous applications placed responsibility upon the user: learning how to use the software, getting upgrades and learning how to keep up with this; the network was essentially a transmitter of data. Now Java allows you to develop applications which can be distributed over the network: now the network does all the work of distributing and upgrading. On the Internet at the moment the user is accessing one page at a time, with Java you can download whole applications, such as a spreadsheet or a video. This will allow equal market access for small and big companies to multimedia applications all over the world with the cost of investment reduced by no longer needing to develop different standards for different infrastructures and platforms.

Information Infrastructures and the Distribution of Multimedia Services

The session focused on how governments can ensure efficient but equitable access to new multimedia services through the promotion of the development of information infrastructures.

Neil McMillan, Chair, WTO Negotiating Group on Basic Telecommunications Services, DTI, United Kingdom, outlined how the development of information infrastructures, and the liberalisation of that infrastructure, could be used as an impulse for the creation of the information society and multimedia services. He described the growth of services in the United Kingdom which had occurred with the liberalisation of service and infrastructure provision there, and suggested that the key issue was getting the regulatory structure right. The government had originally been somewhat nervous of liberalisation, as it was thought that the market was perhaps too small and there was very little experience in liberalisation. A duopoly was introduced as it was also thought that British Telecom might have trouble retaining profitability, and to protect the growth of the new operator, Mercury Communications. The fears about BT proved to be totally unfounded, and the government now had no involvement in BT apart from holding one preference share which allowed it to ensure that the chairperson of the company did not represent any national security threat. Other licenses have been introduced for mobile operators and, since 1991, a number of other public telecommunications operators. One hundred and fifty operators have now been licensed.

In retrospect, the duopoly may have been a mistake, and if greater competition had been allowed earlier the UK market might have been more mature than it now was. The government has simplified and in some cases abolished the licensing system, but it also leaves calculations as to the financial viability of their investments to the companies themselves. One unique feature of the UK until the recent passing of the 1996 U.S. Telecommunications Act, was that cable TV operators were allowed to provide a full range of TV, voice, and data services -- including multimedia services -- in the local network. There are 90 such franchises, and last year there were 1 million customers for voice telephony from cable TV operators, and this figure was growing by 50 000 per month. Penetration rates have in fact increased in the UK since liberalisation, not least because in some of the cable franchise areas up to 15 per cent of the customers taking telephone service from cable TV did not have a telephone before -- many of which are in the poorer, inner city areas. The result of this process of liberalisation in the UK had been an explosion in the number of lines and the services offered.

If similar growth in services was to occur at a global level to that which had been experienced in the UK, international liberalisation was needed. Some competition has been introduced in the European Union, though at the moment this is still limited. Full competition will occur from the start of 1998 in most EU countries, though a few countries are allowed to refrain from full competition until 1993. International simple resale is allowed for capacity on leased circuits connected to the public switched networks between the UK and those countries where there is considered to be sufficient competition at the other end. Six countries qualify for this: Australia, New Zealand, Canada, Sweden, Finland, and the UK. The Japanese MPT has announced that it will allow international simple resale in 1997, and this should add Japan to the list. But a duopoly has been retained in international services, as a result of the distortions of the international market by limited competition and the accounting rates which operators pay each other. A consultative document has just been released which would allow full competition for international services in the UK from July 1996. But attention needs to be paid to the negotiations for the liberalisation of basic telecommunications services at the WTO in Geneva, which have been going on since the end of the Uruguay Round in 1993. There are now 50 participants in these discussions, a few more are expected to join, and a number of countries have yet to make clear their final offers. Many countries are going ahead with liberalisation of their telecommunications sectors anyway, but these negotiations have helped to bring forward decisions which might otherwise have been put off, and if the negotiations fail progress will be stalled.

People will not invest in new services, people will not use new services, and infrastructure for new services will not be developed if prices are too high. At the moment, prices for international services in particular are way above what it costs to provide those services. Technology is further reducing costs. This will sooner or later bring down the accounting rate system between the U.S. and the European Community, and eventually present other countries with a dilemma if they are not to lose increasing amounts of traffic. The problems with this situation will be further compounded for developing countries if they continue to maintain foreign ownership restrictions in telecommunications, and thus hold back investment in network expansion and modernisation. As developing countries tend to be rather a long way from the main centres of economic activity, this disadvantage will reinforce their relative economic underdevelopment.

Seikichi Sakakibara, Executive Director, Association for Promotion of New Generation Network Services, Japan, outlined some of the lessons for service development which were being learned from the broadband pilot project underway in the Kansei Science City near Kyoto. The project was set up within the context of the national fibre optic infrastructure development programme for the year 2010 initiated by the Telecommunications Council established by the Japanese government two years ago. The goal of the present pilot project is to integrate telecommunications and broadcasting and it was defined last year and built on the experience gained in two previous trials.

The MPT has set aside per capita ¥75 million for laying a national optical fibre network in Japan by 2010. The service pilot project has optical fibres built to 300 households. Because much of the project is aimed at fundamental science research, 70 per cent of the financing comes from the government. There is a central facility which cost ¥3 billion to construct, with HiVision facilities. ¥10 billion has been set aside for experiments over six years, which began in 1994.

A number of services are being given trials. One is a virtual post office. Local prefectures are offering produce which can be electronically ordered and paid for at the post office. Postal savings accounts can

also be checked. A very popular service is karaoke. There are 1000 songs and tunes based on MPEG 2 technology, of which 600 are continuously being accessed, and for which the cost is ¥10 per song. Half of total usage time per month is concerned with this service. Another popular service is the news desk, or news-on-demand, which is being developed by the national broadcaster NHK and CNN and which also costs ¥10 per access. Video-on-demand has 300 movies but has not been so popular, and costs ¥100, ¥500 or ¥1000 per movie depending upon the film. Advertising has been tried with movies in the form of previews as a means of reducing the cost of movies. There are also problems with the cost of copyright: lump sum payments have been chosen as the best form of payment, and these amount to ¥3 million per year. Games are also popular, with an average of two hours use per day. Videotelephony is also being tried but is not very popular and is often used with the video capability turned off. Housewives and elderly people are the main users, with grandparents using the service to see their grandchildren.

Jung-Taik Oh, Team Leader, Telecommunications and Information Industry Research, Korea Information Society Development Institute, Korea, stressed the role of government as the dynamic catalyst in making informatization smoother and faster in the process of economic development. In Korea, the government had announced an initiative for a Korean Information Infrastructure in April 1994, the aim of which is to connect every home, school, library, hospital and government agency to a high speed network by the year 2015. Implementation of the plan is expected to cost US\$60 billion, of which 95 per cent is expected to come from the private sector.

The private sector will lead in the construction of the KII, while the government will reform the rules, regulations and policies needed to promote innovation and competition in the sector, including public education in use of information and communication technologies. As part of the plan, government agencies and other public bodies will be linked together in a New Korea Net-Government network which will be completed by 2010 in order to establish a leading group of service users. The NKN-G will be complemented by construction of a fibre optic New Korea Net-Public network by 2015, which will provide a wide range of digital, interactive services for the general public in business and the home. The government will also be responsible for initiating various test-beds and pilot projects in such areas as distance learning, telemedicine and electronic commerce in order to assess the validity of technologies, evaluate applications and create initial demand for services. User committees of public institutions, research institutes, universities and small and medium-sized enterprises will be set up to develop and evaluate applications.

Sectoral Convergence, Social Values and Regulatory Reform

The session focused on the regulatory and policy reforms needed to remove barriers to multimedia service development and to release the potential social and economic rewards of new content possibilities.

Sandra Graham, Director, Broadcasting Policy Branch, Canadian Heritage argued that the information society presents an unprecedented opportunity for all countries -- both developing and developed -- to communicate, share ideas, understand one another, and to create jobs and wealth. In Canada in 1993-94, the arts and cultural sector (excluding sports) reached \$27.6 billion, with direct employment totalling 850 000 jobs. Expanding this definition to the Information Society (Culture and Information Services) -- including the telecommunications and computer services sectors -- the value increase to \$63.8 billion or 10.2 per cent of the total economy, employing some 1.45 million people. For Canadians the information highway was not just data transmission on pipes and wires -- but the beginning of an information society

in which citizens see themselves reflected in the products and services available, and within which computers changed from being work tools to being cultural entertainment systems.

A Canadian vision of content consisted of the production and distribution of creative, high-quality viable products that made use of new and existing resources, including cultural and creative assets: an economic engine, creating jobs and using creative and skilled people through demand by industry and the consumer for product and service content. The multimedia industry in Canada showed a growth rate outpacing the general economy: in 1993-94 the direct impact of the computer services, and cultural and communications sectors on the economy totalled just over \$1 billion, and created some 123 000 jobs. Between 1988 and 1994 revenue from all software development has almost doubled (95 per cent). In the five years ending 1993-94, the traditional cultural industries most closely involved with CD ROM production -- book publishers and exclusive agents (distributors with exclusive Canada rights) -- showed revenue growth of 16 per cent, and film producers reported a 71 per cent increase in revenues during the same period.

Yet new products and services did not magically appear on computer screens or television sets, they had to be produced, created and developed by someone -- or in most cases -- many people, and distributed, marketed, retailed, and bought. All this took place in a new industrial chain linking players from many different traditional sectors as they come together to deliver new products and services -- convergence. But how do we make policy and establish mechanisms to support an industry when its structure is rapidly evolving, when production capacity is unknown and when distribution channels are only beginning to be available world wide? Government had to use the range of measures at its disposal -- policy, regulation, support - to facilitate the creation of a self-sustained, dynamically competitive market for the provision of content which will ensure the long-term production of, and demand for, Canadian multimedia products. In the 1990s, financial imperatives, and a citizenry seeking greater transparency and accountability in government have lead to a critical and continual rethinking of the "core" responsibilities of the federal government level. Government is asking: How should we be involved? Can anyone else (another level of government, private sector, civil society) do this more efficiently and effectively? How do we best work together? How do we ensure that public interest and public goals are met? Will this enhance the ability of our citizens to meet the challenges and changing patterns of employment required in a globally integrated economy? Governments must balance the social, cultural and economic needs of its citizens (i.e. cultural heritage preservation, ensuring Canadian presence in the domestic and international Information Society, and job creation) with the industry requirements of competition (non-regulation). Policy deliberations and debate both nationally and internationally centre around these converging bottom lines: for government -- social, cultural and economic public interest goals, and profit for industry.

The sectoral convergence implicit in multimedia is at the heart of these policy questions. In the near term, the majority of products and services available will not be new so much as representing a new bundling of existing elements. For industry, convergence represents new partners, new ways of working, and new encounters with government regulation and policy. This convergence reflects the fact that technology alters traditional means of creation, production, and distribution, and the interests of corporate Canada. Convergence does not necessarily change existing sectoral policy objectives for Canadian society. The challenge for government is in creating or modifying mechanisms to stimulate cross-sectoral activity while maintaining the discrete policy objectives of each sector. The New Content possibilities of a strong multimedia industry have the potential to create social, cultural and economic rewards for a "connected" few or for all citizens as members of the Information Society.

Glender Alberto, Mexican Embassy in Tokyo (on behalf of Dr. Alejandro Navarrete Torres, Director of Television, General Directorate of Broadcasting, Mexico) presented the regulatory reforms that the Mexican government had introduced to stimulate the services market. He noted that telecommunications

were promoting one of the most important changes humanity has ever seen. The development of multimedia services required new technological approaches and infrastructure investments, but, due to their wide scope, also new political and regulatory frameworks which were adapted to current trends in global markets. Mexico recognised that the old policies of a state-controlled economy were no longer valid. After signing several free trade agreements Mexico gave its first major step into opening its markets. Other policy strategies included transferring the control of the state-owned telephone company Telmex to private hands in 1991. Since then, Mexico's telecommunications industry had grown at an annual rate of more than 12 per cent, which is 7 times greater than the growth rate of the economy as a whole, for the same period. The Federal Telecommunications Law was enacted on 8 June 1995, providing a new regulatory framework for telecommunications in Mexico. The law opened to competition all the telecommunications sector, made the licensing process transparent and non discretionary, provided legal certainty to investors, and opened more options to the end user.

The Federal Telecommunications Law covered four main areas: (1) satellite communications (opened now to private investment); (2) spectrum-based telecommunications networks (licenses granted through auctions); (3) cable-based telecommunication networks (can exploit any telecommunication service that technology allows); (4) provisions to promote effective competition (tariffs are set freely on a non discriminatory basis, cross subsidies will be eliminated, and an independent regulatory agency established by August 1996.) In addition, foreign investment was being allowed in up to 49 per cent of voting stock in the telecommunications sector (though not including broadcast services). The new regulations promoted better use of the installed infrastructure, as many services could now be provided by the same network, and public networks interconnection was compulsory upon request. Tariff control had been eliminated from cable TV services at all levels, and the favourable opinion of the Federal Competence Commission was needed to participate in spectrum auctions.

Dirk Max Johns, Head, International Programme Co-ordination, ZDF Television, Germany, argued that there was a range of problems which broadcasters faced in developing multimedia services in Europe. Both private and public broadcasters in Germany operated under heavy restrictions. Public broadcasters were very limited in access to advertising, so that a major income source was very restricted. This had not been very important in the past but would be enormously important for whatever they were trying to develop now. For commercial players, quotas on European content was a problem, especially for foreign broadcasters who had their whole library based on overseas productions but were trying to come into European markets. In addition, ownership restrictions posed a problem. Broadcasting in Europe was also currently moving from national regulation towards trans-national regulation, and this was confusing in terms of who one had to deal with. The single biggest problem is copyright. Multimedia needs clear solutions: what needs to be defined, or re-defined is the balance between the rights of the authors and the creators and the rights of the audiences to access the creations. The regulations which exist now are almost entirely inappropriate for a multimedia environment, and if we are to be serious we can hardly do a thing now and in the years to come.

At the moment, though, broadcasters are really just experimenting with the development of multimedia services to see what worked and what interested people, in order to gain experience and develop practical applications for in two or three years time, while realising that many regulatory issues were unresolved. Broadcasters saw the technical developments going on, but were still smarting from the experience with D-MAC analogue high definition TV, which had probably been the greatest single technological disaster in the area in the last few years as no one had listened to what consumers wanted. This was the mistake broadcasters were seeking to avoid in multimedia. The major issue of debate in Europe at the moment

was over the appropriate digital platform (or set-top box) for consumers to receive, combine and pay for all on-line applications. There were currently two conflicting standards (D-Box and MMGB) and whichever one was successful would probably become the European norm. The question is whether this will really be a “platform” or whether it will really be a bottleneck? And whichever bottleneck arises, will there be open access? Will it only be the provider of the set-top box which will be able to say what will come through it, or will the consumer really be able to access whatever they want? This is the major regulatory issue at the moment, but has not yet been resolved.

A number of stand alone CD-ROM applications had been developed, as well as some on-line ones. It was unlikely that the end user would want everything on one terminal. There was also the question of transmission means, and fibre-optic cable was not the only option here. However, terrestrial television and terrestrial broadcasting in general will be abandoned very soon and replaced by cable and satellite. But these developments really related to the question of containers, not what was in them, and which content the consumer wanted in which container. There was an assumption that the consumer had a huge time budget and would go out and buy whatever was offered. This was not true, and in Germany, when the number of TV channels was increased from two 15 years ago to the 30 available to the average household now, the number of viewing hours remained the same. There was a need to focus on specific market possibilities. Some of the alliances being formed amongst different sectoral groups were signs of a fundamental insecurity, were unfit in providing the innovation, creativity and flexibility needed for the new environment, and were ultimately doomed to fail. However effective the market is, though, it is also necessary to supply some cultural goods and some unbiased information; free public service is still needed and will help open up the market. Allowing foreign ownership can only be a benefit in a multi-channel environment. Cross media ownership, though, while allowing material to be used in many different fields, is a problem in that it allows owners in one medium to control what is said and discussed concerning other media and destroys many of the smaller players.

The legal situation is by definition behind service development: you cannot regulate something which does not yet exist. And it is a mistake to ask legislators to define rules for something which even the industry does not yet know what it is: it is therefore important to use this “free-trial” period carefully. But traditional regulations on content were devised in an era of frequency scarcity, and this will be reversed. Mass media requires a lot of investment, but in the new environment mass media was being eroded and many services were becoming increasingly individualised. What will be ruled will be different from now, and it needs to be decided who rules, whom they rule, and where they are to be ruled. The new networks are international and open forms of delivery, it is difficult to impose content controls within this context, and governments consequently needed to educate people in how to use these new services and then give them good services to use. But the individualisation which is occurring means that there will not be one global culture; people will need communication to their relevant field, and this could be the people around each other or the people who share the same interests in a slightly larger environment but who might be on another continent too. Quotas will not achieve this as values are not created by rules but by a consensus in society. What is seen in Germany at the moment is the emergence of a big German market: what people are using most is whatever is offered in the German language. And a similar trend is happening in Vietnam, for instance. So what we will have is more global communications and more local communications; overall we will have more communications, and that is very positive. A lot of new values are being created on the information highway, but we should not be scared of this and we should not try to rule what these values should look like beforehand. It is ironic, but the more individual communication we have the more sense of community we have, though a new sense of community.

Roles for Industry, Government and the OECD in the Coming Multimedia Society

The roundtable panel reviewed the commercial and regulatory environment needed to stimulate the growth of multimedia services, how traditional regulatory structures need to be reformed to create a new balance in relations between the public and private sector, and the role that the OECD can play in advancing this process of reform. In his opening statement, the Chair, **Professor Shumpei Kumon**, Executive Director, Centre for Global Communications (GLOCOM), International University of Japan, emphasised the need for a strong communications sector if services were to be developed to their full potential. He emphasised the danger of too rapidly or excessively regulating the sector. New infrastructures were needed. NTT last year announced an OCN (Open Computer Network) scheme, the first step of which has been to unbundle its trunk lines and circuits. But OCN should not be monopolised by NTT: there should be many OCNs by industries to many different kinds of networks, and the government must provide an environment conducive to interconnectivity and providers of competitive alternative services. The OCN is also inadequate as a trunk network concept. Community Area Networks (CANs) also need to be supported by the government. This can be done competitively, though a national CAN is also necessary. These will be large job creators. Computer networks are labour intensive at the moment, and perhaps 1 million engineers will be needed to build and maintain LANs and CANs.

The other question is that of empowerment. Information empowers, and consideration needs to be given to how this is organised and controlled between individuals and governments at a national level and between governments at an international level.

Mark Armstrong, Chairman, Australian Broadcasting Corporation, re-emphasised the importance of content, and of building a creative infrastructure composed of all the existing film, TV, computer software, games and other industries. This was particularly important for a small economy concerned with economic and cultural survival. The only way to have a presence in multimedia was to efficiently combine available skill, money and audience resources as never before. Part of this effort related to the use of government's role as a pioneering user of multimedia and interactive services. The budgets which governments control for education, delivery of social services, and culture are large, and there was a real opportunity not to ask governments to spend more money but simply to be more efficient by offering its own services through multimedia and interactive means. The Australian government had made a strong commitment to use new technologies to perform its own role in serving the community, and if this succeeds everybody would win.

One problem with the creative infrastructure which draws everything together, though, is that it raises the question of a concentration of power. The approach to this problem is to agree that cross-media ownership restrictions probably cannot be maintained for a long time. Even if one wanted to maintain them, there would be too many problems of defining the separate industries. The radical answer which had been developed in Australia was for an access regime to be regulated by very detailed laws which have already been published in draft form for discussion. The idea is that any corporation which controls access to the community or the audience through a TV set-top box, through an audio-visual network, through a telecommunications network or by other means will be obliged to make available capacity open to others at a fair price. This goes well beyond existing thinking on interconnection between telecommunications networks. This should allow new players and alternative sources of information to succeed. Such access regimes would be an interesting issue for the OECD to pursue.

Another important issue is intellectual copyright. The existing international and local network of copyright collecting societies and agencies is quick enough at providing access to people who want clearance of rights and permission of copyright owners. The question of copyright in relation to multimedia is often put in terms of whether rights should exist. But the real issue is that people wish to use material -- and multimedia is a voracious consumer of copyright material -- those who are happy enough to pay the money cannot quickly enough identify the owners or pay them. This causes many months of delay in the creation of new multimedia products. The response to this challenge from the existing copyright community has been far too slow. An opportunity exists to bypass this problem without in any way having to damage the system, namely electronic trading in copyright which could be provided by any private sector organisation. Markets exist for so many commodities that are traded electronically that it would not be hard for a very small percentage of the rights involved by way of commission to establish almost instantaneous trading in rights to audio-visual and other material.

Detlef Eckert, Advisor to the Director General, DG XIII, European Commission, suggested that, as well as agreeing on general principles, it was important to examine the details of service development. Even if there was official agreement to allow access to national markets, it does not help if there is a long procedure to fulfil formal requirements translated into two languages (as was the case in Belgium, for instance) or more. So there are plenty of opportunities to stop open markets evolving. Because of this situation, the European Community has been supporting the creation of a broad *Information Society* for two years now. This follows ten years of work on telecommunications and information technologies, and market liberalisation and harmonisation for telecommunications services.

Sometimes it was not so easy to get some Member States to agree to telecommunications liberalisation in 1998, though agreement has now been reached. Regulation will be light, and there is still some homework to be done particularly on interconnection and licensing. Business can be expected to ask for more European action, for instance by having a single European license instead of different national ones. Telecommunications will certainly be a driver of the information society; but the information society will also change telecommunications, taking it out of its privileged, or rather highly regulated, corner. At the end of the day it should become a normal economic sector, ruled by competition rules and by more or less nothing else.

The information society is a global one, because information knows no borders. But, as has been pointed out, demand is increasingly for local material -- both on the Internet and in broadcasting -- though there is a lot of international material around. People are asking for something that is close to them, that is appealing for them. When it comes to the content, the globalisation of the Internet is a two edged sword. On the one hand there are those who object to pornographic material, on the other hand there are totalitarian regimes trying to stop democratic material. We need to educate our people in how to use these new multimedia tools. A global society also means how we look at markets and foreign investment. To take the example of mobile communications: These markets have grown in Europe for a number of reasons, including feedback from U.S. investments and adoption of expertise in marketing and European expertise in network development and mutual standards formulation. But it is in those markets where liberalisation of markets has occurred and foreign investment allowed, that prices are lowest and services most prolific.

A similar situation could soon occur with the development of digital TV providing video-on-demand and new network based services offering interactivity and audio-visual content. The proliferation of channels

will undermine the existing broadcasting regulations which were built on the assumption of frequency scarcity. The question is whether broadcasting regulations should be imposed on the interactive multimedia field or limited to traditional broadcasting media which will be less and less important. The European Commission thinks that interactive multimedia services are not broadcasting and should be as free as possible. However, we also have to tackle the question of those services which are in the public interest: education, health, transport, environment. Here more public leadership is needed, though not necessarily to do it themselves but through re-shaping the public services and inviting private individuals offering, for instance, telematics for transport on the motorways. There are huge markets in these areas, and this is where, in the next two years, the European Commission will concentrate its efforts: to see, and support, pilot projects, demonstration projects and trans-European networks in these fields. We are prepared to work for an information society on a global level, though we want to have give and take; but we expect the market to demand this.

Neil McMillan, Chair, WTO Negotiating Group on Basic Telecommunications Services, DTI, United Kingdom, addressed the question of different standards of what is appropriate content in a situation where transmission capacity is very large. He argued for a more relaxed attitude towards what is put out on channels in such a situation, compared to traditional broadcasting approaches. It should be regulation by the individual. The information society is one which should be left as much as possible to the creative talents and economic strength of the private sector. Government does have a role -- and last month the British government did launch an information society initiative which was not to spend vast amounts of money but does provide some seedcorn finance for applications and awareness of what can be done in addition to what the UK has already brought on a commercial basis through the combination of cable TV and telephony circuits which a great deal of multimedia services to run on it.

Risaburo Nezu, Director, Directorate for Science, Technology and Industry, OECD, outlined the future work which he felt the OECD could usefully undertake for Member countries. He suggested there were nine areas where the OECD could make a contribution to the international community. The first was in regulatory issues. The organisation had invaluable long term experience in this area, though the range of issues touched by the development of multimedia services meant that this experience would need to be developed in new ways. The implementation of market mechanisms and competitive regimes meant that there would be less need for supply side measures and a greater emphasis upon the demand side. Competition had brought many benefits, and it was the role of government to ensure a framework, the conditions for competitive, dynamic business activities through ensuring a transparent, open (and hopefully a simple) and easy-to-understand set of rules so that players can play the game. The rules must be open not only for the domestic players, but also for the international players and this meant the rules could not be defined in isolation but within an international context.

The multimedia industry has to be global. First, the high fixed costs involved in the industry meant that unless very large markets were assured there would be no investment. Second, the growing amount of networking involved in the development of multimedia services also meant the business needed was becoming increasingly global. So, while accepting that national governments have the prerogative to determine their own rules within their national context on the basis of national sovereignty, there was a need for a certain level of convergence of rules, particularly amongst the countries of the OECD. Otherwise there will be a number of difficulties, particularly in trade issues. The OECD has a role in bringing together government officials, and increasingly private sector representatives, to discuss the issues and possible solutions to problems.

The second area where the OECD can play a role is in the area of technology. On the one hand, there are those who argue that governments should not judge the future direction of technology; on the other hand, there are some governments who are very eager to play an active role in developing certain types of technologies. These two lines of thinking are not necessarily contradictory. There may be some room for governments to be both neutral in terms of technology and still active in certain areas. Many people talk about spillover effects in multimedia technologies. In other words, there is greater social or public returns on investments than the private sector can achieve on its own, and this supports the need for some conscious role for government particularly in regard to generic technologies (in supporting R&D for example) without distorting competition in the market. In what particular areas this can be done in relation to multimedia technologies has still to be discussed, and the OECD was pleased to encourage these discussions on an international basis.

The third area is jobs, or employment. It was clear that multimedia technologies could create a large number of jobs, and it was probable that information and communication technologies would create more jobs than they would destroy. But there were still important things to consider. The timing issue, for instance: there is a gap between when jobs are created and when they are lost. Jobs can only be created over a relatively long space of time, while job losses can occur immediately. Those who benefit from these technologies and those who lose their jobs are not the same people. So the role of the government here was how to maximise the benefits of the technologies while minimising the pains. Here the role of education, training and skills, need to be examined, and need to take place not only at one particular point in people's lives, but over the entire span of their lives. In this area, however, we need more analysis. Our experience and our data are insufficient to allow us to make sensible economic analyses. We need to collect more data so that we can make an analysis which is really more convincing to the public that the development of these technologies are in their interests. The OECD is well placed to help in this kind of enterprise.

The fourth area is in relation to small and medium sized enterprises (SMEs). Government policies have often been designed on the assumption that SMEs suffer from being disadvantaged. Yet in this area it is often claimed that such companies have advantages of speed, dynamism and flexibility -- particularly in relation to what are often called niche markets -- when compared to large enterprises. This challenges the bases of past government policies. It is time for government officials to review their policies in this area.

The fifth area is in intellectual property. The question is whether the existing system is adequate for addressing the significant changes which have occurred as technology has developed. At present, the OECD has found that the existing intellectual property regime is generally adequate to protect intellectual property rights, including in multimedia contents. However, there are certain areas where further improvement is required and is possible. There is a need, for example, for creators of multimedia works to know who owns certain intellectual property rights, how they can gain access to those rights, how a price can be negotiated, and so on. There is the potential for some international mechanism which allows private business people to get this kind of information rather more easily and readily. The OECD may be able to facilitate the discussion leading to the development of such mechanisms.

The sixth area is in encryption. The OECD has already started work in this area and this will start to become intensive, with a view to arriving at certain guidelines -- hopefully within the next 12 to 18 months.

The seventh area is in public procurement. There is a general belief that government should not be over active. But governments capture between a quarter to one third of national economies. So they have to be players on the purchasing side. By using this power they can affect the future development of multimedia services, whether in terms of technologies or standards, and governments must be very careful about the implications of their purchasing actions upon the market.

The eighth area relates to the WTO negotiations. In order for negotiations to succeed they have to be realistic. The OECD is able to help advance those negotiations which cannot realistically occur within the WTO because of the sheer number of countries with different levels of development which participate in the WTO. The OECD represents a relatively homogeneous group in which agreement is possible on some subjects, and has valuable experience as a precursor to negotiations by identifying and analysing issues, and co-ordinating positions amongst developed countries. The OECD can continue to play this role in the area of multimedia services.

The last area is in statistics. We talk about living in a Global Information Society, or multimedia society, but how do we know without solid facts? The OECD is basically an economic organisation which starts and develops arguments on the basis of solid analysis and factual data. If we are to reinforce our future work, there is a need to improve statistics on the development of multimedia services. Most of the existing statistics are based on traditional industrial classifications, which are increasingly irrelevant. There is a need for a new sort of statistics, and we are beginning to think about this. This would enable us to work with Member countries on appropriate policy solutions to the obstacles they face collectively.