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Shaping Policies for the Future of the Internet Economy

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OECD Ministerial Meeting on the Future of the Internet Economy

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Foreword

This report has been developed to support the objectives of the *OECD Ministerial Meeting on the Future of the Internet Economy* (Seoul 17-18 June 2008). It links the Seoul Ministerial *Declaration on the Future of the Internet Economy* to the analytical work and policy guidance developed for the Ministerial by the OECD.

The aim of the Ministerial is to promote the Internet economy, a concept inclusive of the full range of economic, social and cultural activities supported by the Internet and related information and communication technologies. This report serves that objective by providing policy directions and guidance in 20 areas aimed at facilitating convergence, stimulating creativity, strengthening confidence, and expanding the opportunities for global economic, social and cultural development. It integrates work from five OECD Committees responsible for information and communication technologies, consumer policy, education, public governance, health and development. Policy guidance developed by OECD Committees in six areas has been produced for this report as well as three OECD Council Recommendations that express the common position of, or will of, the whole OECD membership and entail the political commitment of the Member countries to abide by these recommendations. This guidance and recommendations form an annex to this document that supports the Seoul Ministerial Declaration by setting it in a policy context.

The report was approved by the OECD Committee for Information, Computer and Communications Policy (ICCP) on 28 March 2008.

Introduction

The Internet is transforming our economies and societies. It provides an open, decentralised platform for communication, collaboration, innovation, productivity improvement and economic growth. Along with information and communication technologies (ICTs) it promotes closer integration of the global economy and interactions that increase general well-being. As the services it supports become pervasive, ubiquitous and more essential in everyday life, the *economy* is increasingly the *Internet economy*. The capacity of economies and societies to seize opportunities and meet challenges in a wide range of areas – the environment, education, health, demographic change and, more generally, the delivery of commercial and government services – already involves the use of ICTs, seamlessly interconnected by the IP-based networks of the Internet.

Promoting the Internet economy is a way to improve our ability to boost economic performance and social well-being, and to strengthen societies' capacity to improve the quality of life for citizens worldwide. OECD countries share a vision of the Internet economy, as articulated in the Seoul Ministerial Declaration, in which its expansion is a way to bolster the free flow of information, freedom of expression and protection of individual liberties, as critical components of a democratic society and cultural diversity. Better use of the tools it provides can help address global challenges, such as climate change. To give concrete form to this vision requires awareness in the policy community of the increasing economic and social importance of the Internet.

This report, based on analytical work by the OECD (see Table 1), recognises that the dynamic nature of the Internet and its rapidly changing environment (see Figure 1) may lead to unforeseen – and unforeseeable – developments. It acknowledges that the open and collaborative nature of the Internet challenges traditional policy-making processes and that a multi-stakeholder approach to achieving an appropriate balance of laws, policies, self-regulation and consumer empowerment may be the only way to promote the Internet economy effectively. An effective and innovative multi-stakeholder approach has to be developed for government, the private sector, the technical community, civil society and individual users to join forces in shaping the policy environment for the future of the Internet economy.

Earlier OECD work has aimed at fostering growth of, and building trust in, the digital economy. Much of this work, listed in Table 2, emerged in response to the 1998 OECD Ministerial Conference on Electronic Commerce held in Ottawa, Canada. It provided a sound basis for the development of policies and practices over the past decade. In large part, the success of such policies is due to their formulation, adoption, monitoring and review by multi-stakeholder communities. It is necessary to continue to ensure the effective implementation of these policies and practices. It is also necessary to examine their relevance as the Internet economy evolves. Some existing recommendations have been reviewed, and where necessary supplemented, in light of developments such as social networks, sensors, mobile access or fibre optics. In certain areas, OECD work has been extended. In others, new policy guidance has been suggested to facilitate the development of national policies and practices.

This report highlights ways to encourage the development of the Internet economy. It looks first at the infrastructure on which its development relies and the need to strengthen and extend broadband networks. It considers the ways in which the Internet already contributes to social and economic goals. It looks to how the Internet can act as a catalyst to further these goals through policies that facilitate convergence, stimulate creativity, strengthen confidence and expand the opportunities for global economic, social and cultural development.

The report seeks to provide guideposts for shaping policies and practices for the future of the Internet economy in this rapidly changing and inherently global area. It seeks to improve international co-ordination while addressing many common challenges:

- Making Internet access available to everyone and everywhere.
- Promoting Internet-based innovation, competition and user choice.
- Securing critical information infrastructures and responding to new threats.
- Ensuring the protection of personal information, respect for intellectual property rights, and more generally a trusted Internet-based environment which offers protection to individuals, especially minors and other vulnerable groups.
- Promoting secure and responsible use of the Internet; and,

- Creating an environment that encourages infrastructure investment, higher levels of connectivity and innovative services and applications.

It also identifies linkages and gaps in policy domains where future work may be useful. It is addressed to OECD countries as they face these challenges, and it seeks to be of value to OECD observers and, more generally, non-member economies.

The Internet: extending the infrastructure of the global economy

An initial policy focus is the further diffusion of broadband, the infrastructure of the Internet economy. The OECD Council report *Monitoring the 2004 Recommendation on Broadband Development* notes tremendous progress in the diffusion of high-speed, "always on" broadband access to the Internet. Using a variety of technologies, certain OECD countries have reached nearly 100% broadband coverage and many countries have may great strides in extending broadband to rural and remote areas. Throughout the OECD area, average broadband prices have fallen while average speeds have increased. In a growing number of countries "last-mile" copper-based connections are being upgraded to facilitate greater high-speed connectivity. Access by households, businesses, governments and schools has significantly improved as has the range and use of applications, content and services.

On the demand-side, OECD countries have focused on increasing uptake of installed capacity and paying attention to electronic business, digital delivery and broadband applications. In particular, OECD governments have implemented demand-based approaches for spreading broadband access. Policy makers made particular efforts connecting schools, libraries and other public institutions. The spread of broadband has reinforced existing activities and driven new forms of – sometimes more participatory – usage and content-rich broadband applications. Higher data-intensive applications are developing, *e.g.* streaming high-definition video and TV, new peer-to-peer applications, health or education applications, virtual conferencing, and virtual reality applications.

Policy objectives to further the diffusion of broadband and better measure its use include:

- Ensuring that market structures allow for developing broadband infrastructures that deliver high-quality services at competitive prices with a broad range of user choice.

- Addressing current and future access divides that place some users or localities at a relative disadvantage.
- Ensuring that policies promote innovation in new broadband networks, applications and services through support for research and development.
- Encouraging policy co-ordination among agencies, ministries and the private sector for the deployment of advanced broadband applications in vital sectors such as health, education, the environment and transport.
- Continuing monitoring of broadband developments in the context of the Recommendation of the OECD Council on Broadband Development and considering a review of the Recommendation to take account of new issues and developments.

Using the Internet to improve economic performance and social welfare

New technologies, tools and innovative services have made it easier to take advantage of the opportunities made available by the Internet infrastructure. The OECD report *Broadband and the Economy* shows in particular that networked ICTs will have very extensive economic and social impacts in the foreseeable future. Broadband networks allow the expansion, aggregation and globalisation of markets as well as the customisation of goods and services and the largest productivity gains will come increasingly from the use, rather than the production, of networked ICTs. The implications for all users are multifaceted and far-reaching. For example, by empowering consumers through greater access to information, facilitating price comparisons, increasing competition and creating downward pressure on prices, the Internet has begun to transform the relationship between suppliers and customers, creating opportunities for new user-driven business models.

Policies to address challenges such as making government services more accessible, improving health care, providing access to quality education and better managing the environment can exploit the functionalities of networked ICTs. These are areas in which governments play a significant role and which account for a large share of their budgets and the economy. They thus represent essential areas for realising the potential benefits of the Internet economy.

In this rapidly changing environment, reliable evidence is needed to support policy debate and formulation and to determine the effectiveness of practices. Statistical systems must be able to follow adequately changes in access to, and use of, the Internet and related ICT networks by citizens, businesses and institutions. Indicators and metrics that take account of the diversity of IP-based networks and of economic and social flows over these networks are necessary to provide reliable measures of evolving uses and of the impact of the Internet on economic performance and social well-being. They can also create incentives for deploying the networks that provide the connectivity necessary for the development of the Internet economy.

Policy objectives for better integrating the Internet economy in the broader economy include:

- Ensuring that policies and practices favourable to the deployment and use of the Internet are systematically factored into public policy development, in all areas including trade, competition, tax policy, social policy and regulatory reform as well as those listed below.

In particular, indicators and analysis are needed to:

- Improve our ability to identify the drivers of Internet access and applications and measure its use by citizens, businesses and institutions.
- Enable the evaluation of the impact of the Internet on economic performance, notably on productivity and innovation, and social well-being, particularly through improved access to education, health and government services.
- Enhance our understanding of differences and barriers to its use, including issues of confidence.
- Enable a better understanding and quantifying of various aspects of the Internet, such as its size, areas and patterns of growth, or potential vulnerabilities, through the measurement of Internet traffic flows.

E-government

Over the last 10 to 15 years, e-government has become *the* tool for supporting governments' functions and interaction with citizens and businesses and the backbone for communication and service delivery in the public sector, as described in the OECD's report *E-Government for Better Government*. The introduction of a variety of e-government services, from filing tax returns to registering vehicles on line has improved efficiency and streamlined processes, making it easier for citizens and businesses to interact with government. E-government contributes to reform by offering the means to transform the public sector as part of an ongoing, continuous process. It can drive innovation and change by forcing governments to rethink organisational structures, division of responsibilities and public sector business processes. If governments are to deliver individualised and coherent e-government services, they need to have the necessary front- and back-office mechanisms and to identify user demands and needs with the help of their citizens.

Work to address these challenges should aim at:

- Improving efficiency in mass processing tasks and public administration operations through consistent implementation of e-government. Internet-based applications can generate savings on data collection and transmission, provision of information and communication with users and can facilitate sharing of data within and between governments while respecting privacy and personal data.
- Improving public services by making usability a core element of public sector transformation and reform agendas. The Internet can help governments to appear as unified organisations and provide seamless services. E-government services should be developed in light of demand and user value as part of an overall multi-channel service strategy.
- Harnessing the power of collaborative networks to help stakeholders share information and ideas and contribute to achieving policy objectives. For example, online information can boost the use of education and training programmes, and sharing health information can improve resource use and patient care. The sharing of information on individuals, however, raises privacy issues, and the potential trade-offs need to be carefully

assessed. Timeframes need to be realistic as the benefits may take some time to appear.

- Contributing to efforts to discourage corruption, increase openness, transparency and trust in government as well as to reduce government spending through more effective programmes and improvements in productivity via ICT-enabled administrative simplification and enhanced government information.

Online health services

All OECD governments are struggling with questions of affordability, quality and efficiency of their health-care systems as they deal with rising health-care expenditures, demographic change and the increase in chronic illnesses. Meeting these challenges will require improving and transforming health-care systems and processes, as well as developing new and effective ways to deliver care. In particular, it will necessitate greater emphasis on prevention and a shift from the current provider focus to more patient-centred care. Although technology alone cannot solve these problems, it is widely recognised that ICTs can act as a catalyser and enabler of change. National and regional strategies for developing health information infrastructures, for enhanced use of advanced ICT applications and for ensuring networking and interoperability are emerging in areas such as electronic patient record systems, remote patient monitoring and delivery of health care, and improved diagnostics and imaging technologies. OECD countries are, however, encountering greater-than-expected barriers to the implementation of these strategies. Analysis in these areas is under way by the OECD Health Committee which has found that the most important impediments are financial, human and organisational.

To accelerate implementation and adoption of ICT for improving health care it is necessary to:

- Share lessons, improve evaluation and engage in benchmarking.
- Develop a better understanding of drivers and incentives for adoption and use of ICT in health care applications.
- Improve the policy framework for more rapid uptake of remote and cross-border monitoring of chronic illnesses, and cross-border interoperability of patient records.

E-education

Evidence from the OECD Programme for International Student Assessment (PISA) confirms a particularly strong correlation between educational performance and home access to, and use of, information technologies. Students with little access to the Internet seldom use ICTs, lack confidence in their use and tend to perform less well in schools, even when taking into account observed differences in socio-economic status. As a consequence, the disadvantages of students whose parents have low educational or occupational status are likely to be exacerbated by a lack computer access. This may be offset to some degree by use of ICTs at school although the results suggest a weak link between school access/use and performance. This raises questions about the extent to which using the Internet only as a supplement to traditional teaching methods can fully compensate the lack of home access.

The apparent weak link between school performance and some kinds of computer usage also warns against assuming that more means better. It is the quality of ICT use, rather than the quantity, that determines the contribution of these technologies to student outcomes. This suggests that policy should address:

- The lack of ICT skills that may exacerbate socio-economic divides. Broad strategies for access to and mastery of ICTs need to be coupled with targeted programmes for lagging groups.
- The need for a policy shift from providing technology in countries with nearly universal basic computer access to ensuring that it is used effectively.
- The need for teachers to be appropriately trained, including substantial hands-on experience during initial teacher training. As new digital and media literacy skills are needed to participate in the Internet economy, teachers should be encouraged to develop these skills.
- The responsibility of schools and universities as well as parents to ensure that young people learn how to make proper educational and safe use of the Internet and to address issues such as plagiarism and the critical use of sources.

Addressing environmental challenges

OECD countries face local, regional and global environmental challenges: climate change, improving energy efficiency and waste management, addressing air pollution, water quality and scarcity, and loss of natural habitats and biodiversity. The Internet and the ICT industry and research community can help tackle environmental challenges through more environmentally sustainable models of economic development. Current and emerging environmentally friendly technologies, equipment and applications, for example in buildings and transport systems, can support programmes aimed at addressing climate change and improving energy efficiency. The Internet and ICTs can help make businesses more efficient, for example through e-business applications and by reducing travel, and by enabling distance work and new forms of social organisation.

Work to address these challenges should aim at:

- Further developing ICT-based systems and Internet-connected sensor networks and other applications to improve energy efficiency, reduce emissions, and improve resource use and early response to pollutants.
- Adopting cost-effective policies for the objective of, for example, applying ICT solutions to improve the performance of building and transport systems.
- Improving energy efficiency, material use, recycling and end-of-life disposal in the production and use of ICTs, for example through life-cycle audits of ICT equipment and effective policies and targets in areas such as energy labelling and disposal regulations.

The Internet as catalyst

Clearly, the Internet economy is already an important and growing part of our economies and societies, but to reach its full potential in meeting economic and social objectives, a policy environment in which the Internet's role as catalyst can be maximised is essential. Key areas that require policy attention include: a smooth transition to next-generation networks to maximise the benefits of *convergence*; fuelling *creativity* and innovation to underpin economic growth and employ-

ment; and increasing *confidence* in the Internet infrastructure, applications and services.

Benefiting from convergence

Next-generation networks

Voice, video and data services are migrating rapidly towards platforms based on the Internet Protocol. The OECD's *Policy Guidance for Convergence and Next Generations Networks* (Annex A) aims to assist member countries in modifying their regulatory environments to reflect new technologies. It advises governments to identify the objectives underlying their present regulations; to determine if these objectives remain valid and require government intervention in the market for communications services; to evaluate whether existing regulations will be effective in the new next-generation network (NGN) environment; and to develop new solutions when they are not.

Common OECD economic and social regulatory objectives for communication services presently include: universal service requirements; promoting competition, consumer choice and access; consumer protection; access to emergency call services, media plurality and cultural diversity; data security and consumer privacy; competitive markets that offer essential services at cost-based prices; and continued innovation and investment in new technologies, services and applications.

Policy guidance for convergence and next-generation networks includes:

- Reassessing the applicability of existing regulation to encourage investment by the private sector and competitive choice in the marketplace. Current economic regulation needs to be reviewed to ensure that it does not act as a barrier to the ongoing process of convergence and therefore prevent the development of more efficient means of delivery of existing and new services. At the same time policy attention may be required if advanced technologies or commercial activities result in new dominant positions in any market in the value chain.
- Facilitating the development of high-speed broadband networks with enhanced upstream and downstream capabilities, in particular advanced wireless and fibre networks; maintaining and enhancing conditions of effective competition; reducing

barriers to entry by improving the development of, and access to, passive infrastructure and ensuring access on a non-discriminatory basis and on cost-based terms.

- Encouraging the development of technology-neutral regulation where appropriate to ensure fair competition and the development of a level playing field. This would include interoperability, interconnection, spectrum management, emergency services, number portability, security and integrity of networks, and consumer protection and information.
- Reviewing existing rules in light of the convergence of telecommunication and broadcasting, and developing cross-media policies for a multi-platform environment.
- Taking into account the increasing ability to provide cross-border services that are not constrained by either geography or a given network when promoting access to local content.

IP addresses

All devices connected to the Internet need IP addresses to communicate. As the convergence of communication platforms moves towards including the Internet Protocol, IP addresses become crucial to the increased scalability of the Internet and thus to the continued growth of the Internet economy. Deploying the newer version of the Internet Protocol, IP version 6 (IPv6), is necessary to enable billions of people and devices to connect to the Internet. The current pool of unallocated IP version 4 (IPv4) address blocks is declining and will be depleted within the next few years. Shortages are already acute in some regions.

The OECD report *Internet Address Space: Economic Considerations in the Management of IPv4 and the Deployment of IPv6* underscores the need to create a policy environment conducive to the timely deployment of IPv6 while maintaining security and stability, as well as service continuity. Policy efforts should focus on working with the private sector and other stakeholders to increase education and awareness and reduce bottlenecks; on demonstrating government commitment to adoption of IPv6; and on pursuing international co-operation and monitoring IPv6 deployment.

Empowered consumers

Over the last decade, increased competition and the development of a range of new products have transformed the communication services sector. They have brought significant benefits to consumers and other users, including falling prices, higher-quality services, a wider choice of service providers and access to new services. These trends are likely to continue, and even intensify, as next-generation communication infrastructures and services are put in place.

These changes have, however, created challenges. As communication services have become more complex, it is increasingly difficult for consumers to evaluate and compare alternatives. Pricing structures may not be clear and contracts may limit consumers' ability to switch providers or terminate a contract easily. Yet, it is increasingly recognised that communication services markets can be strengthened by consumers who can, through well-informed choices, help stimulate price competition, innovation and improvements in quality. By making well-informed choices among suppliers, consumers and users not only benefit from competition, they help drive and sustain it.

The OECD *Policy Guidance for Protecting and Empowering Consumers in Communication Services* (Annex B) addresses some of the key issues currently facing consumers in this market. It is designed to promote market transparency and more effective consumer protection, while maintaining an environment that encourages investment in developing new communication services.

The guidance advocates:

- Encouraging the development of services that provide consumers with a range of quality products at competitive prices.
- Informing consumers about potential security and privacy risks in using communication services and available measures to limit these risks.
- Enhancing consumers' awareness of the availability and benefits of services and suppliers and of consumers' rights.
- Improving the transparency of contracts and ensuring that they are not unfair to consumers.
- Minimising the costs associated with switching services.

- Facilitating timely, inexpensive, easy-to-use, effective and fair settlement of consumer complaints.
- Ensuring that services are widely accessible to all, and, in particular, to disadvantaged and vulnerable consumers.

Sensor-based environments and ubiquitous networks

Radio frequency identification (RFID) enables wireless collection of data on electronic tags attached to or embedded in objects, for identification and other purposes. It has been used for many years in transport, access control, event ticketing and management, more recently in government identity cards and passports, and extensively in manufacturing supply chains and in logistics for goods distribution. It can be viewed as a first step in the direction of "ubiquitous networked societies".

In the longer term, small wireless sensor devices embedded in objects, equipment and facilities will increasingly help individuals in their daily tasks and enhance business processes, supply chain management and quality assurance. They will enable distance monitoring of ambient conditions (*e.g.* temperature, pressure) and be used in a myriad of new applications, in areas such as health care and environmental monitoring. They are likely to be integrated with the Internet through wireless networks that will enable interconnectivity anywhere and at any time. While the future uses and capacities of technologies that bridge the physical and virtual worlds are still largely a matter for speculation, they are expected both to bring economic benefits and raise societal challenges. Today's concerns related to the invisibility of data collection by RFID devices and to the ability to trace and profile individuals may be exacerbated if tags and readers become pervasive and are combined with sensors and networks.

The OECD *Policy Guidance on Radio Frequency Identification* (Annex C) encourages research on the economic and social impacts of such technologies and argues for addressing policy issues early in their development and deployment. It aims to foster business R&D and new applications, encourage technological neutrality, develop information, awareness and education activities and demonstration projects, particularly for new applications. It also encourages the development of consensus-based open global standards, international interoperability and harmonisation of frequency bands as appropriate. The guidance points out the need to prevent and mitigate security risks and to

address privacy concerns arising when information relating to an identified or identifiable individual is collected or processed.

The guidance focuses on the need for governments to:

- Share their experience and good practices as widely as possible to maximise the benefits from public sector investments and to help diffusion of the technology.
- Encourage the development and adoption of open global standards and their harmonisation within and across sectors. As far as possible, this should be addressed through market mechanisms and should involve all stakeholders.
- Encourage and facilitate applications when considering spectrum licensing and allocation and encourage the development of internationally compatible applications.

It also focuses on the need for governments and other participants to:

- Adopt a comprehensive approach to developing a security management strategy, including security risk assessment. Where appropriate, participants should also take a comprehensive approach to designing and operating a privacy management system, including an impact assessment and implementation of technical security and privacy protection measures.
- Collect or process information relating to identified or identifiable individuals using these systems with the knowledge and, where appropriate, the consent of the individuals concerned.
- Inform individuals provided with functional tags about the existence of the tags, associated privacy risks, and mitigation measures – whether or not personal data is collected.

Promoting creativity and innovation

The Internet and ICTs enable and support creativity and innovation, encourage entrepreneurial activity, and stimulate the restructuring of industries and institutions. They account for a significant share of research and development (R&D), patent applications, firm start-ups and venture capital. As a major depository of information, the Internet also facilitates co-ordination and co-operation among researchers and entrepreneurs, linking the creativity of individuals and allowing organisations to collaborate, pool distributed computing power and

exploit new ways of disseminating information (*e.g.* via the participative web, social networking tools and virtual worlds, and new open access repositories for scientific and technical data).

Cross-disciplinary, mutually reinforcing policies and initiatives are necessary to boost performance and enhance the Internet's role as an enabler of innovation. Four areas require particular policy attention: *i)* strengthening the use of the Internet by government, business and research communities; *ii)* ensuring open and collaborative mechanisms, including for developing open standards and interoperability for the Internet of the future; *iii)* supporting development and use of digital content and public-sector information; and *iv)* encouraging the use of the increasingly participative web across a widening range of economic and social activities.

ICT-enabled research and innovation

The Internet and ICTs are profoundly changing how research and creative activity are undertaken (*e.g.* distributed research, grid and cloud computing, virtual simulation, virtual worlds), with potentially major impacts on innovation and growth. They are fostering new types of market-based entrepreneurship and encouraging people outside traditional institutions and hierarchies to collaborate to produce content, services and goods. The Internet enables the rapid diffusion of codified knowledge and ideas, thereby linking science more closely to business, and facilitates the development of informal creative networks. Central to this is open access to the vast amounts of information and data available over the Internet. The *2007 Recommendation of the OECD Council concerning Access to Research Data from Public Funding* (Annex D) applies to research in this area.

This Recommendation reaffirms the need to:

- Promote a culture of openness and sharing of research data among public research communities.
- Raise awareness of the potential costs and benefits of restrictions and limitations on access to and sharing of research data from public funding.
- Highlight data access and sharing regulations and practices in the formulation of member countries' science policies and programmes.

Maintaining an open and interactive environment may require adapting public investments in research and technology and public funding and incentives for R&D and innovation (*e.g.* tax incentives) to ensure that they cover new research domains and new ways of organising research and innovation. These include:

- Developing software, networks, broadband content and related services as the core of new strategies for stimulating creativity.
- Strengthening Internet-based collaborative research and experimental networks.
- Promoting access to digital research information.
- Developing new models of scientific and technical digital publications to further improve access.

Digital content and services

The OECD reports *Digital Broadband Content* and *Policy Guidance for Digital Content* (Annex E) emphasise the role of digital content in enhancing competitiveness. Digital content products are driving the market for mobile services and applications and stimulating demand for new infrastructure, content and skills. Platform convergence (video, voice and data), rapid diffusion of high-speed broadband, increasing upstream as well as downstream bandwidth and the evolution towards information-rich, knowledge-intensive economies will further underpin growth. Rapid changes in the value chains for content development, production, delivery and use, as well as the creation of new commercial and non-commercial models to exploit these opportunities, challenge both existing business models and policy paradigms.

Because the marginal costs of exchanging and reproducing information and digital content are very low, the challenge is to facilitate access to and use of digital content and develop new business models while preventing unauthorised use. Intellectual property rights (IPRs) grant exclusive rights to an original invention or work for a limited time and are important for commercialising inventions and artistic works. These rights are balanced by public interest obligations regarding access to and dissemination of knowledge and creative works (disclosure obligations for inventions and fair use, fair dealing and exceptions and limitations for copyright). As two OECD reports, *Remaking the Movies: Digital Content and the Evolution of the Film and Video Industries* and *Digital Broadband Content: Music,* have demonstrated, the music and video industries are still grappling with these issues as they seek to

develop new, more effective and popular ways of commercialising their products on line.

Policy can help foster the creation, access to and use of digital content by:

- Providing incentives for the creation, dissemination and preservation of digital content (*e.g.* open innovation strategies, university-business collaboration, incentives for long-term research and intellectual property rights), and encouraging investment in this area.
- Facilitating global access to content regardless of language and origin.
- Encouraging technology-neutral approaches, interoperability and development of open standards when addressing technological issues.
- Improving information and content quality and accuracy through policies to facilitate the use of tools that help creators identify and disseminate their works and users to identify and access specific information and works.
- Recognising the rights and interests of creators and users, in areas such as the protection of intellectual property rights while encouraging innovative e-business models.
- Addressing shortages in skills, training, education and development of human resources for the creation, distribution and use of digital content.

Public organisations are a major source of information, an increasing amount of which is digitised or produced in digital form and can be re-used in innovative ways for significant economic and social benefit as outlined in the report on *Digital Broadband Content: Public Sector Information and Content*.

The *OECD Recommendation of the Council for Enhanced Access and More Effective Use of Public Sector Information* (Annex F) shows that while commercial and non-commercial access to, and, re-use of, public sector information and content is generally becoming more open, obstacles sometimes impede efficient and effective use, such as restrictive or unclear rules governing access and conditions of re-use; unclear and inconsistent pricing of information if re-use is chargeable; complex and lengthy licensing procedures; inefficient distribution to final users;

and barriers to development of international markets. The role of public sector organisations as collectors, producers and disseminators of public-sector information is not always clear, particularly in competitive market areas.

Specific policy recommendations include:

- Maximising the availability of public sector information for use and re-use based upon the presumption of openness as the default rule.
- Encouraging broad non-discriminatory competitive access and conditions for re-use of public sector information by eliminating exclusive arrangements, and removing unnecessary restrictions on the ways in which it can be accessed, used, re-used, combined or shared.
- Improving access to information and content in electronic form and over the Internet.
- Finding new ways to digitise existing public sector information and content, to develop "born-digital" public sector information products and data, and to implement cultural digitisation projects where market mechanisms do not foster effective digitisation.
- When public sector information is not provided free of charge, pricing it transparently and consistently within and, as far as possible, across public sector organisations so as to facilitate access and re-use and ensure competition.
- When public sector information is not provided free of charge, costs charged should not exceed marginal costs of maintenance and distribution. Any higher pricing should be based on clearly expressed policy grounds.
- Exercising copyright in ways that facilitate re-use, and where copyright holders are in agreement, developing simple mechanisms to encourage wider access and use, and encouraging institutions and government agencies that fund works from outside sources to find ways to make these works widely accessible to the public.

Participative web

The participative nature of the Internet encourages social and economic interaction, innovation and value creation, as described in the OECD's *Participative Web and User-created Content*. Broadband access, the development of user-friendly web platforms, collaboration tools and other social networking software are enabling hundreds of millions of private and professional users to participate in the construction, development and use of Web 2.0, the participative web. It offers opportunities for entrepreneurial, organisational, professional and personal activities and new kinds of open research, innovation and value creation. It also facilitates new forms of citizen participation in public life, the free flow of information and freedom of expression. The policy challenge is to encourage innovation, growth and change and develop appropriate governance that does not stifle creativity or affect the openness of the Internet.

With the rapid growth of user-friendly social networking sites, large amounts of personal information are being exchanged in ways that may not have been anticipated in privacy frameworks or not covered owing to different national approaches to privacy and data protection. Well-targeted "behavioural" advertising can provide services and other benefits to users, but the accumulation of personal data on which it depends also creates privacy and security risks if the information is not used responsibly. Emerging policy issues include: the rights and obligations of content creators, the drivers and barriers to competition, and the applicability of existing business and technology policies to these new environments. The wide range of policy issues associated with the participative web, ranging from technical development to responsible use, will need to be addressed.

Building confidence

The Internet has become the information infrastructure of the global economy. The increasing volume of e-commerce and online financial transactions, the roll-out of e-government, the development of collaborative and social networks, and emerging trends towards the creation of an "Internet of things" mean that building and maintaining trust in the Internet and related ICT networks must be a key policy area. The confidence of the end user is essential to building that trust and to the continued growth of the Internet economy. When it is shaken, even mildly, it is difficult to regain. To prevent loss of confidence, policies and

measures are needed, from increasing the security of information systems and networks to creating trustworthy digital identities, to protecting consumers, personal information, minors and other vulnerable groups, and more broadly to fostering transparency and fairness.

For example, the Internet is an integral part of children's lives in many countries. It is a source of information and entertainment, plays an important role in education, and is increasingly part of their social environment. However, these benefits create risks in areas such as online identity theft, bullying, stalking, access to inappropriate material and loss of privacy. To build confidence, children, and their parents, need the knowledge and tools that make it possible to remain safe on the Internet. More broadly, governments, the private sector, civil society and the Internet technical community need to collaborate to build an understanding of the impact of the Internet on minors in order to better support and protect them when they use it.

Another example is the changing privacy landscape. New technologies are bringing dramatic changes to the collection, storage and use of personal information (*e.g.* storage is inexpensive, so data tend to last forever; the sheer volume of personal data now maintained by organisations is overwhelming; data can be transferred with just a click of the mouse; processing tools are powerful, ubiquitous and cheap; much personal information is searchable, linkable and traceable by search engines, location-based services, RFID and sensors). Trends in globalisation, fuelled by these technological advances, have multiplied data flows. This leads to changes in the behaviour of organisations and individuals, bringing new opportunities for individual expression and greater efficiencies for organisations, but also an increase in privacy-related risks. These include data breaches facilitated by the volume of personal data being transferred and used or risks related to secondary usages of personal data. Recent efforts by a cross-section of the privacy community to help refine approaches to privacy are an important step towards better protecting personal data in a challenging and changing environment. Multi-stakeholder co-operation will be needed to assess current OECD privacy instruments in light of changing technologies, markets and user behaviour, and the growing importance of digital identities.

As the Internet increasingly supports the development of the global economy, its continuous availability, reliability and security are vital to governments, businesses and individuals. Increasingly, governments need to work with all stakeholders to anticipate threats within and to the online environment. One way to do so is to strengthen efforts to

develop a culture of security so that users better understand the nature of the risks and are aware of the tools that can protect them. Governments also need to co-ordinate their policies to respond to potential threats by supporting law enforcement co-operation, establishing public-private partnerships and more generally designing appropriate policy frameworks to provide protection at the level of the network infrastructure, in online marketplaces and for Internet consumers.

Critical information infrastructures

Critical infrastructures are increasingly interdependent and rely on the effective functioning of ICTs. The monitoring and control of power grids and water plants, for example, often depend on the functioning of underlying IP-based networks. Further, most industrial control systems that monitor and control critical processes are increasingly connected, directly or indirectly (through corporate networks), to the Internet and therefore face new threats. Finally, malicious activity on line is increasing and adversely affects all Internet users and activities. Unfortunately, critical information systems have not proven immune to this phenomenon.

The OECD *Recommendation of the Council on the Development of Policies for the Protection of Critical Information Infrastructures (CII)* (Annex G) highlights the relevance of the OECD Security Guidelines and calls on governments to protect these information infrastructures, as their disruption or destruction might seriously affect the health, safety, security and well-being of citizens or the effective functioning of government or the economy. This is a national policy priority which requires co-ordination with private-sector owners and operators of critical information infrastructures and co-operation across borders.

Specific policy recommendations include:

- Identifying government agencies and organisations with responsibility and authority to implement clear policies to protect CII and ensuring the transparent delegation of responsibility to facilitate closer co-operation within the government and with the private sector.
- Consulting with private-sector owners and operators of CII to co-operate on the implementation of these policies and enabling regular exchange of information with the private sector by establishing information-sharing arrangements that acknowledge the sensitivity of certain information.

- Co-operating among governments and with the private sector at the strategy, policy and operational levels to ensure the protection of CII against events and circumstances that individual countries would be unable to address alone.
- Conducting a risk assessment based on an analysis of vulnerabilities and threats to the CII, in order to protect economies and societies against the risks of highest national concern.
- Developing an incident response capability, such as computer emergency response teams/computer security incident response teams (CERTs/CSIRTs), in charge of monitoring, warning, alerting and carrying out recovery measures for CII.

Malware

Malicious software, or "malware", is used for information and identity theft or denial of service attacks. If unchecked, it could undermine confidence in online markets. Spread across the Internet in various forms, malware exploits common network vulnerabilities, degrading the integrity and security of the system as well as the data within it. The OECD report, *Malicious Software (Malware)*: *A Security Threat to the Internet Economy*, developed in collaboration with the APEC Telecommunications Working Group, shows that malware has the potential to adversely affect any and all Internet users, from enterprises to governments to end users. To improve what is still a fragmented, local response to a global threat, more structured collective action is needed by those with responsibility for combating malware. However, these actors need a common point of departure from which to build co-operation. They need to come together, share information, understand each other's challenges, and look at the problem collectively and comprehensively.

In light of this need, the report recommends that OECD and APEC partner with other international organisations to involve all actors and develop a multi-pronged strategy to turn malware into a high-risk/low-return activity. Such a partnership should aim to develop a policy framework at domestic and international levels to address economic, legal, technical, information-sharing and incident-response issues related to malware and enhance collaboration among all the public and private sector communities affected by, and involved in, fighting malware.

Digital identities

Trustworthy user identities are essential to the sustainable growth of the Internet economy. The management of digital identities encompasses processes and tools that operators of online systems can use to establish a person's identity and control access to and use of resources within that system. The possible benefits of effective identity management to e-commerce, e-government and social interactions are enormous.

Research by the OECD and others shows that to be effective, identity management systems will have to be deployed in a manner that maintains user confidence on line by minimising information security risks and individuals' risks to their privacy and individual liberties. It will require an approach that blends good design and usability, appropriate security, user education and awareness, and a legal and policy framework to protect digital identities and associated personal data and to allocate risk. As the Internet economy develops, the protection and management of digital identities will be one of the most important public policy issues shaping the future of our e-society. Clearly, secure digital identities as well as effective systems to manage them and to protect individuals' privacy will help reduce identity theft.

Online identity theft

Identity (ID) theft occurs when a party acquires, transfers, possesses or uses personal information of another party (*i.e.* a natural or legal person) in an unauthorised manner, with the intent to commit, or in connection with, fraud or other crimes. It is an illicit activity with a long history which has expanded as the Internet and e-commerce have developed. Today, victims' personal information is being obtained on line through the use of constantly evolving methods and techniques, including malware (harmful software), phishing (fraudulent solicitation of personal information), and spam ("junk" mail).

There are three basic elements to combating online ID theft: prevention (*i.e.* what can be done to lower the risk of identities being stolen); deterrence (*i.e.* what can be done on the enforcement front to discourage theft); and recovery and redress (*i.e.* what can be done to facilitate recovery of stolen IDs and obtain compensation or other redress for the harm caused).

The OECD's *Policy Guidance on Online Identity Theft* (Annex H), identifies ways to enhance efforts to combat ID theft, focusing on ways to increase awareness. It builds on previous OECD work on related issues (See Table 1). Combating online ID theft includes pursuing initiatives that focus on:

- Alerting and educating consumers and other stakeholders to new and existing techniques being used to steal identities on line and to measures which consumers and other stakeholders can take to protect their identities while on line.
- Collecting and disseminating information on developments and trends relating to online ID theft and its economic impact on stakeholders.
- Encouraging business and governments to examine ways to improve the security of consumers' personal data and raising their awareness of the benefits of using electronic authentication tools.
- Developing legal definitions of the concept of ID theft, with a view towards facilitating co-ordination of domestic and international efforts to prevent, deter and provide redress against such theft.
- Requiring companies to take more steps to prevent ID theft, such as disclosing data security breaches affecting their customers when those breaches could result in ID theft, or improving customer authentication when providing services or transactions.
- Exploring ways to strengthen efforts to combat ID theft, for example, by introducing more dissuasive sanctions, increasing co-ordination of cross-border enforcement and providing more effective mechanisms for victims to recover identities and obtain redress.

Consumer protection and mobile commerce

Mobile commerce refers to interactions and commercial transactions conducted through wireless communication services and networks by short message services (SMS), multimedia messaging service (MMS), or the Internet, using mobile devices. Quite a broad range of activities is already being carried out on mobile devices, including the purchase of goods and services, payment for public

transport and the management of banking transactions and accounts. Technological advances suggest that consumers and users will continue to be presented with new ways of doing business.

The rapid growth of mobile commerce has, however, created challenges for consumers and users because the small screen size and the limited storage and memory capacity of mobile devices limit the information consumers receive about transactions. The use of mobile phones by minors, in particular, raises concerns about potential commercial exploitation and misuse, with potentially significant financial and privacy implications. In addition, a number of questions have to be resolved as regards liability in cases of fraudulent use of mobile devices.

The OECD's *Policy Guidance for Addressing Emerging Consumer Protection and Empowerment Issues in Mobile Commerce* (Annex I) provides practical suggestions for addressing challenges that consumers increasingly face in the mobile commerce marketplace. It encourages:

- Developing practices to ensure that consumers using mobile devices are provided with adequate information for making informed decisions about the products and services they purchase and the firms with which they do business, and that they know the costs, terms and conditions of mobile transactions, including ways to verify and confirm them.
- Developing policies and tools to ensure that minors are protected from adult and other inappropriate content on the mobile platform, and to prevent minors from engaging in excessive or inappropriate transactions through technological means and increased education and awareness.
- Helping consumers avoid the risks of unauthorised use of mobile phones by educating them about ways to protect themselves from loss and misuse, by encouraging stakeholders to develop policies and tools to deter unauthorised use (including the development of security precautions and built-in security features), and by exploring means of enhancing consumers' liability protection in mobile commerce transactions.
- Developing policies and tools to limit the sharing of consumers' personal data and enable them to decide with whom to share such data, including data on their physical location, and to encourage mobile operators to implement data security policies and measures to prevent data breaches.

- Developing dispute resolution and redress policies aimed at establishing fair, effective and transparent mechanisms to respond to consumer complaints in relation to both domestic and cross-border mobile commerce transactions. Inexpensive and easy-to-use means of redress should be available when consumers suffer financial loss or their data are compromised as a result of a mobile commerce transaction. There should be clear information on the entity or entities responsible for handling claims involving mobile operators and other mobile service providers.
- In addition, in view of the dynamic nature of mobile commerce, governments and other stakeholders should continue to track developments and work together to address emerging issues in a timely fashion.

Developing a truly global Internet economy

A global Internet economy would give people of all countries access to communication services that can enable and enhance their economic and social development. While there have been remarkable developments in this respect in recent years, much remains to be accomplished: four-fifths of the world's population lacks ready access to Internet services. Two issues are particularly prominent. One is the need to build appreciation, among all stakeholders, of the opportunities that the recent successful growth of communication networks can also create for developing countries. Second, as this network of networks becomes increasingly pervasive worldwide, more effective cross-border co-operation mechanisms for preventing malicious and criminal activity should be developed. By addressing these issues governments can empower users worldwide through broader access to a trusted online environment.

Developing Internet access

The OECD report, *Global Opportunities for Internet Access Development,* discusses the policy and regulatory changes needed to enable people at all levels of society in developing countries to begin to share in the Internet/ICT revolution. In addition to reduced barriers and access costs, people need skills to make the Internet truly accessible and universal. The report argues that this offers commercial opportunities

and that capacity building is essential for creating an enabling environment.

To extend the benefits of Internet access around the world, policies need to:

- Promote the liberalisation of communication markets to create the necessary conditions for investment, competition and growth.
- Separate operational and policy responsibilities and create an independent regulator with the power to enforce appropriate regulatory safeguards where competition is insufficient.
- Promote partnerships with the private sector and civil society to enhance market access and capacity building.
- Support developing countries' efforts to develop the skills and capacities to take advantage of ICTs as tools for poverty reduction.
- In countries where Internet Exchange Points (IXPs) do not yet exist, build an understanding of their benefits and the barriers to their creation; these are largely not financial but the conditions that would enable IXPs to operate efficiently and become industry-driven.
- Facilitate the development and implementation of internationalised domain names in a way that supports the continuing security and stability of the Internet.

Co-operation on regulatory enforcement to protect users on line

Maintaining trust on line requires laws and enforcement authorities that are able to work together across borders to ensure a basic framework of user protection. OECD governments have developed policy frameworks to assist in cross-border co-operation on law enforcement in the areas of consumer protection, spam and privacy. Their efforts have shown that the types of challenges facing regulatory enforcement authorities overlap substantially and that informal networks linking these authorities are essential for successful cross-border co-operation. They have also found that the problems facing users on line are increasingly serious.

As the global reach of the Internet increases, it is necessary to ensure that regulatory enforcement co-operation expands as well. Objectives for the future include the need to increase the horizontal

sharing of good practice among authorities in different areas, to improve practical support for and linkages among informal enforcement networks, and to continue efforts to better understand the number and nature of cross-border problems faced by users, for example by developing internationally comparable indicators.

The future of the Internet economy

The move towards an Internet economy began little more than a decade ago when the Internet became available commercially thanks to the liberalisation of telecommunication markets and the development of user-friendly applications and services (e-mail, the browser, the web). What many considered a novelty ten years ago has since become a fundamental part of the economy and society. As the Internet now serves more than one billion users, the world's economy is now an Internet economy. Ten years ago, few would have predicted that broadband access, Internet telephony or social networks would become a mass phenomenon. The speed of Internet-induced change and the potential further effects on our economies and societies during the next decade make it essential to look forward and outline a future policy agenda.

Convergence, the development of next-generation networks and high-speed wireless networks, and the diffusion of RFID and other automatic identification technologies are expected to change the functionalities of the Internet. At the same time, this network of networks is becoming more global as it is transformed into a platform for economic and social interaction involving both people and objects. Many of the issues discussed in this report, such as improving broadband access, expanding digital content, improving access to public sector information, and countering identity theft are well-defined, with policies already in place in many countries. However, rapid changes taking place in many areas may lead to new issues which may need monitoring or changes in existing policy frameworks. These areas include:

- The evolution of communication platforms towards next-generation networks, many of which are based on new technologies such as fibre optics, and high-speed mobile networks that fundamentally change market dynamics, usage patterns and consumer behaviour.

- The shift in access from PC-based to mobile, hand-held devices which will become more pronounced as non-OECD economies increasingly go on line.
- The advent of sensor-based networks that create demand for infrastructure capacity, change the nature of monitoring and controlling production and distribution, and raise issues of privacy and security.
- The explosive growth in digital content, the shifting boundaries between physical and digital products and experience, and the development of virtual worlds which raise a host of new policy issues and will test established policy frameworks.

Some of these developments are still at a very early stage but they point already to the need for long-term policy-related analysis to ensure that competition is maintained and enhanced in communication markets, to determine how to protect digital identities, to ensure that consumers are adequately protected and empowered in e-commerce and evolving markets for communication services, and to encourage new digital content services and creativity.

The Seoul Ministerial Declaration underlines that the Internet is a means to achieving economic and social goals, and its role in this respect will surely increase. Further work could usefully be undertaken on a number of pressing economic and social issues that are affected by the Internet and the Internet economy that it underpins:

- Understanding the role and contribution of the Internet and related ICTs as a driver of productivity and economic growth. Central to this is harnessing the Internet as a platform that dramatically alters the innovation process by lowering barriers, broadening collaboration and engaging more people in creation.
- Analysing the economic, social and cultural impacts of emerging Internet technologies, applications and services, including virtual worlds, sensor-based networks and social networking platforms.
- Examining the roles of various actors, including intermediaries, in meeting policy goals for the Internet Economy.
- Improving statistical systems to measure changes in access to and use of the Internet and related ICT networks by citizens, businesses and institutions to provide reliable measures of

evolving usage and of the impact on economic performance and social well-being.

- Researching how the Internet and related ICTs are used in addressing climate change and improving energy efficiency as a basis for developing appropriate policies.
- Conducting analysis and formulating policy guidance for the development and use of converged communication networks.
- Strengthening cross-border co-operation to protect users on-line and combat threats to the security and stability of the Internet.
- Assessing the impact of changing technologies, markets and user behaviour on concepts of privacy, security, identity and consumer empowerment.
- Transforming government and the public sector to become more efficient, transparent and accountable.

This report draws attention to policies that should be considered in light of the emerging Internet economy, both now and in the future. As experience is gained and new issues emerge, they will need to be developed and extended. The policy directions and recommendations summarised here also serve as a useful point of departure for future OECD work, and others are encouraged to build on this report to develop recommendations and principles for guiding the development of the Internet economy.

Table 1. Analytical background papers for the "Future of the Internet Economy" Ministerial

Building awareness of the importance of the Internet economy
Monitoring the Recommendation of the Council on Broadband Development
Broadband and the Economy
E-Government for Better Government
Benefiting from Convergence
Convergence and Next Generation Networks
Internet Address Space: Economic Considerations in the Management of IPv4 and in the Deployment of IPv6
Enhancing Competition in telecommunications: protecting and empowering consumers
Radio Frequency Identification (RFID): A Focus on Information Security and Privacy
RFID Applications, Impacts and Country Initiatives
Promoting Creativity
Digital Broadband Content: Digital Content Strategies and Policies
Digital Broadband Content: Public Sector Information and Content
Participative Web and User-created content
Building Confidence
Development of Policies for Protection of Critical Information Infrastructures
Malicious Software (Malware): A Security Threat to the Internet Economy
Scoping Paper on Online Identity Theft
Mobile commerce
A Global Information Economy
Global Opportunities for Internet Access Developments

Analytical background papers are available at
www.oecd.org/sti/ict

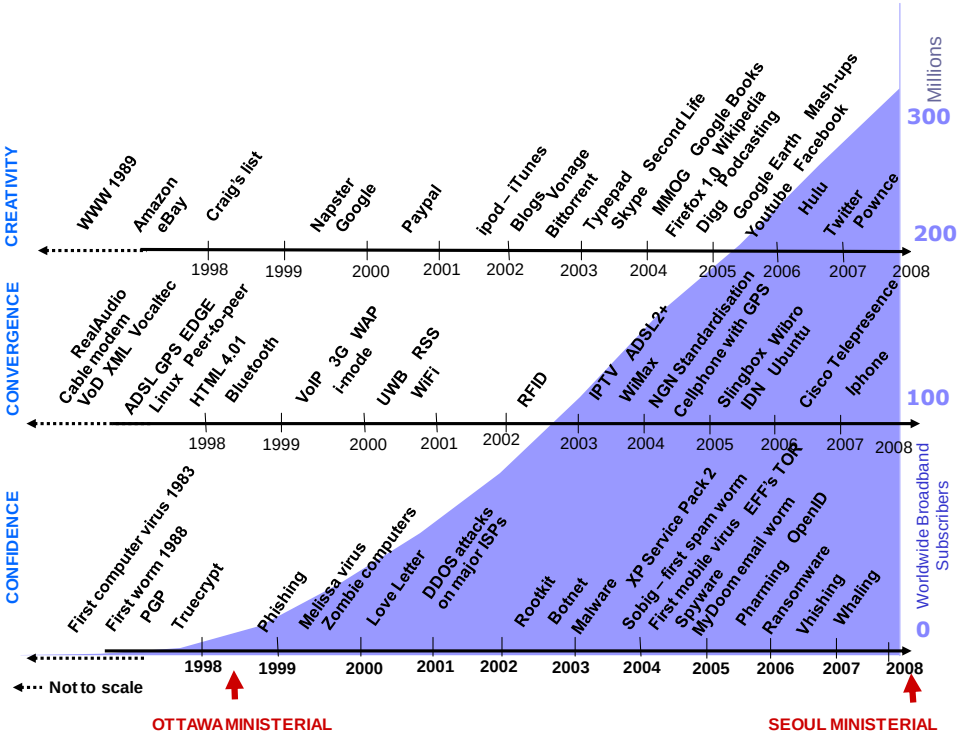
Table 2. Selection of OECD recommendations, guidance and declarations relevant to shaping the future of the Internet economy

1980	Council Recommendation concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data	The Recommendation represents a long-standing international consensus on how best to balance effective privacy protection with the free flow of personal data. It has been put to use in a large number of national regulator and self-regulatory instruments and is still widely used in both the public and private sectors.
1985	Declaration on Transborder Data Flows	The Declaration recognised that technological advances increased the flows of computerised data and information and noted the significant progress achieved in the area of privacy protection at national and international levels since the 1980 Recommendation. The Declaration established the basis for further work in this field in order to develop harmonised policy and regulatory solutions.
1997	Recommendation of the Council concerning Guidelines for Cryptography Policy	The Recommendation on Cryptography Policy establishes principles that member governments should consider in developing cryptography policies at the national and international levels. It was designed to promote the use of cost-effective, interoperable, portable and mobile cryptography systems without unduly jeopardising public safety, law enforcement, and national security.
1998	Ministerial Declaration on Authentication for Electronic Commerce	Adopted by Ministers at the Ottawa Ministerial Conference held on 7-9 October 1998, the Declaration recognises the importance of authentication for electronic commerce and outlines a number of programme elements for the OECD in this area.
1998	Ministerial Declaration on the Protection of Privacy on Global Networks	It reaffirms the importance of the protection of privacy on global networks, and the need to prevent unnecessary restrictions on transborder flows of personal data. It calls for effective implementation of the 1980 Privacy Recommendation in relation to global networks.
1998	Action Plan for Electronic Commerce	Outcome of the 1998 OECD Ministerial conference on "A borderless world: realising the potential of global electronic commerce".
1999	Recommendation of the Council concerning Guidelines for Consumer Protection in the Context of Electronic Commerce	The Recommendation is intended to help eliminate some of the uncertainties that both consumers and businesses encounter when buying and selling online, in order to ensure that consumers are no less protected when shopping online than they are when they buy from their local store or order from a catalogue.

2002	Council Recommendation concerning Guidelines for the Security of Information Systems and Networks: Towards a Culture of Security	The Recommendation aims to develop a "culture of security" - that is, a focus on security in the development of information systems and networks, and the adoption of new ways of thinking and behaving when using and interacting within information systems and networks. It includes 9 policy and operational principles.
2002	Privacy Online: OECD Guidance on Policy and Practice	This ICCP guidance implements the OECD Privacy Recommendation in the context of electronic commerce, based on work to fulfil the 1998 Ministerial Declaration. It draws together work on alternative dispute resolution, privacy-enhancing technologies, online privacy policies, enforcement and redress.
2003	Council Recommendation concerning Guidelines for Protecting Consumers from Fraudulent and Deceptive Commercial Practices Across Borders	The Recommendation outlines a framework for international co-operation to protect consumers against the growing problem of cross-border fraud, particularly on the Internet.
2004	Recommendation of the OECD Council on Broadband Development	The Recommendation aims to encourage the development of broadband, emphasising its importance for economic, social and cultural development worldwide and warning about the risk of missed opportunities from failing to do so.
2006	*a.* Anti-Spam Toolkit of Recommended Policies and Measures *b.* Council Recommendation on Cross-border Co-operation in the Enforcement of Laws against Spam	The Toolkit constitutes an inclusive and coherent instrument to help policy makers, regulators and industry players orient their policies relating to spam solutions and restore trust in the Internet and e-mail. Associated with the Toolkit is also a Recommendation of the Council urging enforcement authorities to share information and work together across national borders to tackle what has become a global problem.
2007	Council Recommendation on Electronic Authentication and ICCP Guidance for Electronic authentication	The Recommendation encourages efforts by Member countries to establish compatible, technology-neutral approaches for effective domestic and cross-border electronic authentication of persons and entities, with a view to facilitate cross-border authentication.
2007	Council Recommendation concerning Access to Research Data from Public Funding	The Recommendation sets out commonly agreed principles to facilitate cost-effective access to digital research data from public funding. It is intended to assist all actors involved when trying to improve the international sharing of, and access to, research data.

2007	Council Recommendation on Cross-border Co-operation in the Enforcement of Laws Protecting Privacy	The Recommendation reflects the commitment by governments to improve their domestic frameworks for privacy law enforcement to better enable their authorities to co-operate with foreign authorities, as well as to provide mutual assistance to one another in the enforcement of privacy laws. The Recommendation is grounded in the OECD Recommendation concerning Guidelines governing the Protection of Privacy and Transborder Flows of Personal Data (1980)
2007	Council Recommendation on Consumer Dispute Resolution and Redress	The Recommendation provides governments with a framework to help consumers resolve disputes and settle claims with business. The framework covers disputes in both domestic and cross-border transactions. It was developed to deal with issues arising from the rapid growth in electronic commerce, but it will also benefit consumers making traditional types of purchases.
2008	Council Recommendation on Development of Policies for the Protection of Critical Information Infrastructures	The Recommendation highlights the relevance of the OECD Security Guidelines (2002) for the protection of critical information infrastructures. It provides guidance on national policies and proposes ways to improve international co-operation for the protection of these infrastructures, recognising importance of the Internet as a global infrastructure. Although addressed to governments, it stresses the need for collaboration with the private sector.
2008	Council Recommendation for Enhanced Access and More Effective Use of Public Sector Information	The Recommendation provides a set of principles that aim to increase economic and social returns on public investments in public sector information through better access and wider use and re-use.

Figure 1. Ottawa to Seoul: Selected developments in the Internet economy



Note: Year on chart refers to the first mention of an application/service, technology or event on CNET from 1995 onwards. Other dates: OECD research. Data represent projected and current fixed network broadband subscribers in the OECD area. High speed mobile wireless access subscribers are not included in this chart.

Source: OECD.