OECDpublishing

Please cite this paper as:

OECD (2006), "Digital Broadband Content: Digital Content Strategies and policies", *OECD Digital Economy Papers*, No. 119, OECD publishing, © OECD.
doi:10.1787/231433678370

OECD Digital Economy Papers
No. 119

Digital Broadband Content: Digital Content Strategies and policies

OECD

Unclassified **DSTI/ICCP/IE(2005)3/FINAL**

Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development **19-May-2006**

English - Or. English

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY
COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY

DSTI/ICCP/IE(2005)3/FINAL
Unclassified

Working Party on the Information Economy

DIGITAL BROADBAND CONTENT

Digital content strategies and policies

JT03209259

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format

English - Or. English

FOREWORD

This report was presented to the Working Party on the Information Economy (WPIE) in June 2005 and December 2005 and was declassified by the Committee for Information, Computer and Communications Policy in March 2006.

The report was prepared by Dr. Sacha Wunsch-Vincent and Dr. Graham Vickery of the OECD's Directorate for Science, Technology and Industry as part of the WPIE work on Digital Content (www.oecd.org/sti/digitalcontent). It is published on the responsibility of the Secretary-General of the OECD.

c OECD / c OCDE 2006

TABLE OF CONTENTS

FOREWORD 2

SUMMARY 4

IMPORTANCE OF DIGITAL CONTENT 6

Traditional content industries 7
Other industries: Broadening the view of digital content industries 7
Government services in areas such as science, health, culture and education 8
New content created by network users 8

GOVERNMENT ROLES AND POLICY 9

A) INNOVATION AND TECHNOLOGY 12

R&D and innovation in content, networks, software and new technologies 12
Venture capital and financing issues 14
Valuing digital content 14
Providing creative environments 14
Skills, training, education 14
Ensuring technological and other spillovers 15
Access to local content, diversity of content and language 15
Research concerning the use side: Social implications of digital content use and creation 17

B) VALUE CHAIN AND BUSINESS MODEL ISSUES 17

Business support, studies and co-ordination 17
Competitive, non-discriminatory framework environment 19

C) ENHANCING THE INFRASTRUCTURE 19

Broadband access and policies 19
Infrastructures for micro-payment systems, electronic signatures, authentication 22

D) BUSINESS AND REGULATORY ENVIRONMENT 23

Intellectual property rights 23
Digital rights management (DRM) 26
Security and privacy 27
Consumer protection 287
Content regulation 28
Fostering legal frameworks adapted to online digital content distribution 29
Taxation issues and fiscal environment specific to digital content 29

E) GOVERNMENTS AS PRODUCERS AND USERS OF CONTENT 30

Governments putting public content on line 30
Governments as content users, demand promotion and aggregation 32
Knowledge creation and distribution: the case of scientific publishing 33

F) CONCEPTUALISATION, CLASSIFICATION AND MEASUREMENT 34

GOVERNMENT STUDIES / PRESENTATIONS IN OECD WORKSHOPS AND CONFERENCES 36

SUMMARY

Digital content is an increasingly major part of the OECD economies which are shifting from manufacture of physical items to high value intangibles. It will increasingly become the basic creative infrastructure underpinning the knowledge economy and be at the centre of health, educational, and cultural activities. Convergence of networks and increased diffusion of high-speed broadband is focusing policy attention on rapidly developing broadband content and applications (new demand pull for the digital economy) which promise new business opportunities and impact on growth and employment.

However, the development of digital content and services and the diffusion of high-speed broadband raise new issues as rapid technological developments challenge existing business models and government policies. Public policy needs to acknowledge these changes and adjust the policy and regulatory environment, and, in parallel, recognise the role of governments as content creators and users. In this new environment network users are also becoming content creators with the advent of new user-friendly software and always-on Internet connections. Business and public policy issues to be addressed are grouped in six areas:

(i) innovation and technology (*e.g.* enhancing R&D and innovation in content, networks, software and new technologies);
(ii) value chain and business model issues (*e.g.* developing a competitive, non-discriminatory business environment);
(iii) enhancing the infrastructure (*e.g.* technology for digital content delivery, standards and interoperability);
(iv) business and regulatory environments that balance the interests of suppliers and users, in areas such as the protection of intellectual property rights and digital rights management without disadvantaging innovative e-business models;
(v) governments as producers and users of content (*e.g.* commercial re-use and pricing of public sector information); and
(vi) conceptualisation, classification and measurement issues.

Government policy does not necessarily have to address all of these areas, but the areas outlined above and developed in more detail below provide a framework for discussion, prioritisation, policy analysis and policy review and development.

(i) Innovation and technology

- Encouraging R&D and innovation in content and content-related networks, software and hardware.
- Building an environment conducive to content production, networks, and technological spillovers.
- Expanding venture capital financing and improving valuation of digital content.
- Addressing skills, training, education and human resource development issues.

(ii) Value chain and business model issues

- Encouraging non-discriminatory business and policy frameworks that underpin competition, creation of new business models and spread of best practices.
- Increasing competition and, where appropriate, co-ordination along value chains to develop new distribution and revenue models (network services, content providers, intermediaries etc.).
- Working to improve technology neutrality and consistent policy treatment of digital content across different, and in some cases converging, content delivery platforms and value chains (content, communications, and digital equipment).
- Working out the role of support for new business and business expansion.

(iii) Enhancing the infrastructure

- Widening broadband coverage and high-quality access to infrastructure and applications.
- Building partnerships to address technological issues related to digital content development and delivery, including standards and interoperability.
- Improving payment and micro-payment systems, electronic signatures, authentication, and development of international interoperability and portability of these infrastructures.

(iv) Business and regulatory environment

- Adapting established regulatory frameworks to digital content value chains and business models.
- Protecting intellectual property and related issues.
- Working to improve digital rights management and development of new transparent business models. Clarification of user rights along content value chains and digital rights clearing systems. Technical issues related to DRM and watermarking systems.
- Clarifying specific taxation treatment, for example tax neutrality for digital content to the extent that it has the same characteristics as non-digital content.

(v) Supply and use of public sector information and content

- Digitising and distributing public sector information (weather, geographic data) and improving access to public sector content (archives, museums), and related access and pricing issues.
- Building the role of governments as model suppliers in putting content online.
- Enhancing access to local content, diversity of content supply and use.
- Expanding public demand for digital content in education, health, etc. Improving multi-device access (*e.g.* mobiles, PDA, TV, PC, consoles) to public sector education and cultural resources.

(vi) Conceptualisation, classification and measurement issues

- Improving the way digital content is measured, developing appropriate indicators and metrics, and improving systematic collection, research and analysis of these industries.

This report presents and discusses a cluster of related policies drawn from the four completed OECD Digital Content sector studies (scientific publishing, music, online computer and video games, and mobile content), government policy presentations during the OECD Panel and Workshop on Digital Broadband Content, and replies to the *Information Technology Outlook 2006* policy questionnaire. On the basis of this information, a comprehensive overview of policies in the area of digital content is developed and illustrated by specific policy examples of OECD countries.

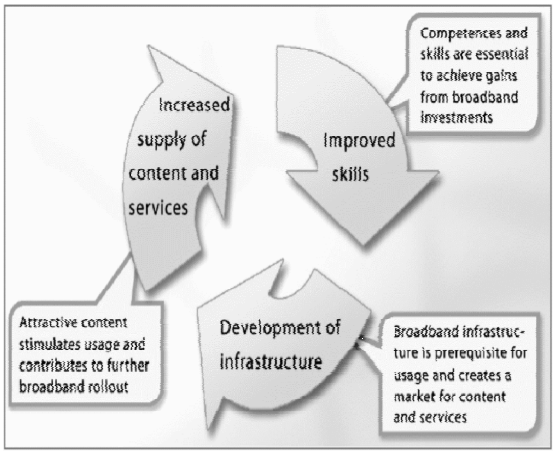
In January 2006, the Italian Minister for Innovation and Technologies and the OECD organised an international conference to shed light on and debate afore-mentioned policy areas (see www.oecd.org/sti/digitalcontent/conference).

IMPORTANCE OF DIGITAL CONTENT

Digital content is an increasingly important part of OECD economies as they shift from manufacture of physical items to high value intangibles. It will increasingly become the basic creative infrastructure underpinning the knowledge economy, and at the centre of health, educational, and cultural activities.[1] Digital content is a rapidly growing sub-set of the output of the creative, cultural, copyright and/or content industries, defined by a combination of technology and the primary focus of industry production.

Analysis suggests a positive feedback cycle between infrastructure, content and skills which is increasingly recognised in OECD country policies (Figure 1).[2] While the availability of broadband networks contributes to the development of digital content, broadband content applications and services are expected to encourage the uptake and effective use of information and communication technologies (ICTs), to drive broadband development. Furthermore, digital content is expected to provide a new impetus for the digital economy, encouraging innovation, raising the level of skills, triggering dynamic developments and innovations in existing industries and creating new markets. Digital content is also driving the rapidly growing ICT hardware, consumer electronics and mobile services and applications market. Today many OECD countries perceive the digital content industries as important elements for international competitiveness.

Figure 1 Positive feedback cycle between infrastructure, content and skills



Source: Norwegian Ministry of Trade and Industry. Presentation of Mr. Eivind Lorentzen to the WPIE Panel on Digital Broadband Content.

The development and delivery of digital content is growing rapidly across a range of very different activities, reconfiguring existing ones (*e.g.* telephone handsets with online game capabilities, new business strategies for video downloading, the provision of government services over mobile devices, etc.) as new digital content developers and providers are emerging. Digital content development and delivery is increasingly common in:

- Content/entertainment industries, whose primary activity is the production and sale of content, including: publishing activities which produce content on a physical support (books, journals, newspapers), software, audio and video products - increasingly in digital form; and content services, for example audiovisual and broadcast services.

- Industries that are not content industries *per se*, but which increasingly produce digital content as secondary or ancillary activities, including business and financial services.

- Government activities in areas such as research, education, health and culture.

- Content created by network users.

Table 1 provides an illustrative list of entertainment and non-entertainment-related content products.

Table 1 Illustrative list of media and non-media content industries/products

Media and entertainment applications	Non-entertainment applications	Government	Network users
Publishing (books, magazines, comics, etc.)	Industrial and visual design	Public sector information for commercial re-use	Web sites
Film / Motion pictures	Software design and development	Research & Science	Blogs and podcasting
Animation (animation characters and avatars)	Business and professional related content	Education	Virtual communities
Music	Advertising	Culture (*e.g.* digital libraries)	Digital photos and video files
Broadcasting / Digital radio / Cable / Interactive TV and other interactive media	Fashion/design	Health	Art works
Software / Computer and video games	Architecture / professional services		
Gambling	Training and adult education		
Mobile content / Telematic and wireless services			

Source: OECD based on various government publications. The list of examples in the four content categories is illustrative and in no priority order.

Traditional content industries

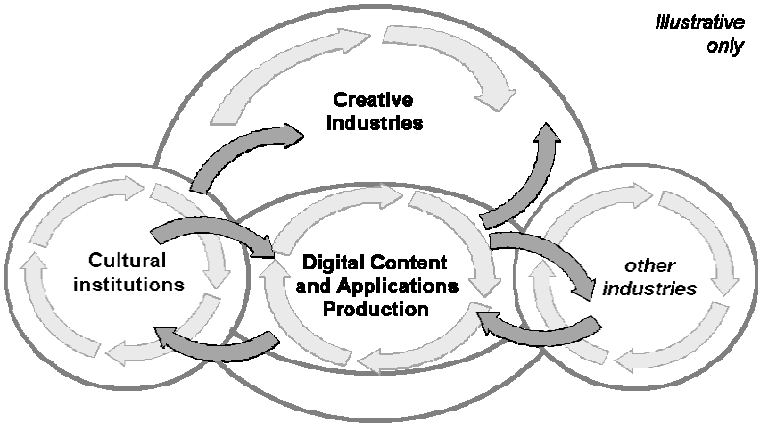
As shown in the WPIE sector studies, content transmitted over electronic networks comes from traditional publishing and entertainment industries and these sectors are experiencing significant transformations in established business models and practices, new products such as interactive digital television, network games, and online music subscriptions and revenue growth (see Table 1 left hand side). Increasing convergence between sectors creates new products, distribution channels and revenue streams.

Other industries: Broadening the view of digital content industries

As economies move towards being more knowledge-intensive, information-rich activities in which content is created, collected, managed, processed, stored, delivered and accessed are increasingly being developed. OECD governments also recognise that digital content pervades a broader range of industry sectors as most activities increasingly rely on digital content and applications from a rapidly widening range of business, professional, education, government and health activities.[3] The broader content industry includes cultural institutions that foster, create and maintain digital content; businesses that produce

content; and allied industries that provide or require content, with growing linkages between cultural institutions, creative industries, digital content products and other industry sectors (Figure 2).

Figure 2 Interactions between cultural institutions, creative industries and other industries



Source: Australian Department of Communications, Information Technology and the Arts. Presentation of Anne-Marie Lansdown to the WPIE Workshop on Digital Broadband Content.

Estimates have suggested that the average *Fortune 1000* company spends up to 3-5% of gross revenues on content managed internally or which is key to the company's business models.[4] The WPIE studies on Digital Delivery in Services Industries showed that non-entertainment service sectors are important producers of digital content. Examples of content products and services from other non-entertainment industries such as business services, distribution, travel, and healthcare include: enterprise content applications, spatial, location and weather information, tourist services, interactive distance learning, remote inspection, medical imaging, distance medical treatment, bioinformatics and health information, home banking, energy management, information management security; all revolving around content access and management in networked enterprises and homes and over a wide range of platforms.

Government services in areas such as science, health, culture and education

Digital content is also moving into core government-related functions including science, research, health, culture and education. Governments play an important role in making content available over fixed and wireless networks (including diffusion of scientific results and information, content from public education institutions, public broadcasters, etc.) and in procuring / aggregating demand for content.

New content created by network users

The online medium allows interactivity, participation, and cultural diversity through online technologies, opening up possibilities for new user-created content.[5] Digital technologies greatly expand the possibilities for individual participation in the growth and spread of digital content.[6] Users may become important participants in the chain of content creation, marketing and distribution as witnessed by the rapid rise of web-logs or "blogs" and other more participatory forms of communication and distribution.

GOVERNMENT ROLES AND POLICY

The completed digital content studies and workshop presentations suggest that there are two distinct digital broadband content-related policy areas: how government policies and regulations affect digital content markets (*i.e.* encourage infrastructure, content and service provision); and how government produces, procures and diffuses public sector digital content (including, *e.g.* demand aggregation in sparsely populated areas).

Governments and the market place for digital content: Market participants create and develop digital content business models. Governments have a role in developing "enabling factors" for the creation (*e.g.* creative environments, ICT skills) and use of digital content (*e.g.* household access to broadband). Governments can act as facilitators, remove impediments to investment and create an appropriate 'pro-digital content' business environment by addressing market failures that hamper R&D, innovation, access to capital, education and the development of skills. The creation of non-discriminatory framework conditions aim to reduce the barriers to entry, improve the competitive conditions (especially for small players) conditions. Competitive markets for content and telecommunication services are key to broadband take-up and content diffusion and use. New content types created by network users also receives increasing government attention.

Governments as producers and users of digital content: The public sector has a major role as a producer and user of digital content and applications. On the producer side, this includes public sector information which can be commercially re-used and public sector educational, cultural (museums, archives), and other content where there are public good and spillover arguments to support a major government role. Governments also participate or support the development and digital access to specific content (*e.g.* of digital back archives of public broadcasters). On the consumer side, governments can promote demand through public demand aggregation and private demand promotion, with significant opportunities in areas such as e-health and online education. Mobile applications are also being implemented in the public sector (school access to student information, access to public safety information). These measures can also improve public sector efficiency.

Many OECD governments have developed a focus on digital content and/or related creative/content industries, either with overarching digital content policy frameworks (such as the UK's Digital Strategy/Digital Content Forum) or with programs specific to certain digital content industries and/or applications. Table 2 presents available information of OECD government initiatives in the field. Governments have to balance different objectives inherent in these strategies: *e.g.*, encouraging widespread information/content access and dissemination, diversity and quality, promotion of information technology in business and society, information literacy, the protection of intellectual property rights, information security and privacy and the reduction of harmful content.

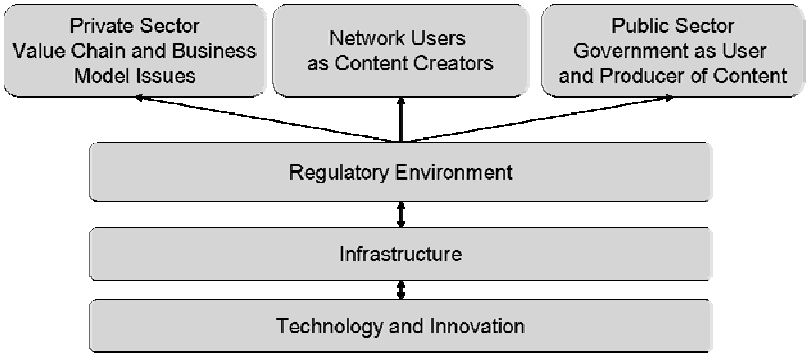
Table 2 Selected examples of OECD country policy initiatives for digital content

	Overarching digital content policy	Institution
Australia	Digital Content Strategy / Digital Content Industry Action Agenda / Strategic Framework for the Information Economy 2004-2006 / National Broadband Strategy	Department of Communications, Information Technology and the Arts
Austria	eContent Initiative / Multimedia Business Austria	Ministry of Economic Affairs and Labour
Belgium	Digitalisation du patrimoine scientifique et culturel des Établissements Scientifiques Fédéraux (ESF)	Ministre de la Politique scientifique
Czech Republic	Participation in the eContent(plus) programme of the EU	Ministry of Informatics
Denmark	Programmes that aim to foster the development and diffusion of digital content	Danish Ministry of Science, Technology and Innovation / Danish Ministry of Culture
France	Audiovisual sector and content policy for the information society	Ministry of the Economy, Finance and Industry, Ministry of Culture and Communication, Prime Minister Directorate for media development
Germany	Information Society Germany 2010 (iD2010)	Federal Ministry of Economics and Technology
Hungary	Initiatives in the field of digital content, public sector information and cultural content	Ministry of Informatics and Communications
Ireland	Strategy for the Digital Content Industry in Ireland / Digital content steering group	Forfás, Department of Enterprise, Trade and Employment / Enterprise Ireland
Italy	eContent Policies and Actions Plans / Interministerial Commission on digital content in the Internet era	Minister for Innovation and Technology / Sviluppo Italia / Innovazione Italia / Ministry of Education, University and Research
Japan	Promotion policy for content business / e-Japan Priority Policy Program 2004 / Intellectual Property Strategic Program 2005	Intellectual Property Strategy Headquarters, Cabinet Secretariat / MIC / METI
Korea	New Growth Engine: Digital Contents Industry Broadband IT Korea 2007 / IT 839 Strategy / Digitization of Public Information Resources / Digital Contents Industry Promotion Policies	Ministry of Information and Communication / Korean National Computerization Agency
New Zealand	Digital Strategy / National Content Strategy / Government's Growth for Innovation Framework / R&D Strategy for creative industries	New Zealand Trade and Enterprise / Minister for Information Technology, Minister of Communications / Ministry for Culture and Heritage
Norway	Norway's Strategy for Electronic Content / Public sector information programmes	Norwegian Ministry of Trade and Industry / Ministry of Modernisation
Portugal	Information Society Action Plan (PASI)	Directorate General for development of the Information Society, Ministry for the Information Society
Switzerland	No overall content policy but various thematically oriented policies, such as in the field of digital geographical information (e-geo) or media art programmes	Federal Office of Topography, Federal Office of Culture and others
United Kingdom	Digital Strategy March 2005 / Creative Industries Taskforce / Digital Content Forum	Prime Minister's Office / Department of Culture, Media and Sport / Department of Trade and Industry
United States	New Generation of American Innovation (Promoting Innovation and Economic Security through Broadband Technology)/ Universal Service Program with the Schools and Libraries Program	Federal Communications Commission / White House (A new generation of American Innovation)
EU	eContent(plus) programme / eEurope Action Plan / High-Level Group on DRMs / 6th Framework Programme (IST) / Directive on re-use of public sector information / Audiovisual Policy	DG Information Society / DG Education and Culture

Source: OECD. This table provides examples and is not meant to be comprehensive. Activities of Intellectual Property Right Offices not included.

On the basis of the WPIE sector studies, government presentations and replies to the OECD *Information Technology Outlook 2006 Policy Questionnaire*, the OECD has developed a policy cluster for digital content of which the overarching components are depicted in Figure 3.

Figure 3 Components of digital content policies



Source: OECD based on government presentations, sector studies and replies to the Information Technology Outlook 2006 policy questionnaire. Adapted from DSTI/ICCP/IE(2004)15/FINAL.

Six main areas of policy challenges have been identified:

A) Innovation and technology (*e.g.* enhancing R&D and innovation in content, networks, software and new technologies);

b) Value chain and business model issues (*e.g.* developing a competitive, non-discriminatory framework environment);

c) Enhancing the infrastructure (*e.g.* technology for digital content delivery, standards and interoperability);

d) Business and regulatory environments that balance the interests of suppliers and users, in areas such as the protection of intellectual property rights and digital rights management without disadvantaging innovative e-business models;

e) Governments as producers and users of content (*e.g.* commercial re-use of public sector information); and

f) Conceptualisation, classification and measurement issues.

This report presents and illustrates this digital content policy cluster by means of examples for OECD countries.

A) INNOVATION AND TECHNOLOGY

R&D and innovation in content, networks, software and new technologies

The final provision of the OECD Council Recommendation on Broadband Development encourages research and development (R&D) in the field of ICT for the development of broadband and enhancement of its economic, social and cultural effectiveness. Governments can address market failures and provide an environment conducive to R&D and innovation and enhance linkages between commercial and not-for-profit R&D and innovation-related activities.

R&D and innovation are of critical importance in the digital content industry.[7] The creation of content is becoming increasingly R&D and innovation intensive. For example, in addition to the artistic and business risks inherent in different kinds of content creation, the creation of a multi-million dollar film production or complex media-rich application (*e.g.* video quality 3D animation and sound) requires creative R&D input. Also, the computer game sector employs leading-edge R&D in areas such as imaging, interactivity and other computer science.

On the platform and delivery side, the design, format, accessibility, and searchability of Web sites and documents are of major importance. Online content delivery necessitates technologies for content packaging and management; compression and encryption technologies (*i.e.* codecs); digital asset, content and rights management; content distribution networks (including mobile services and digital broadcasting); payment systems; and new hardware. Audiovisual content and technological and business applications for the "new digital living room" and "ubiquitous networks" involve the development of open and interoperable platforms and delivery technologies. Technological tools (*e.g.* DRM, watermarking, fingerprinting, encryption) to assure secure and safe access to content (*e.g.* parental controls, firewalls and web blocking technology, anti-virus and anti-spyware technology) and privacy are often required.

But often existing research, R&D programmes and related funding seem inadequate or not specifically targeted towards the digital content industries. A study by the Irish Department of Enterprise, Trade and Employment, for instance, deplores the currently low levels of research in integrated creative and technological areas, and the lack of advanced basic research and related funding for digital content.[8]

R&D tax incentives: The inadequacy of R&D support programmes is also very prevalent in the case of R&D tax incentives. All OECD governments provide these tax incentives designed to overcome market failures and underinvestment in R&D and spur innovation (*e.g.* current year write-offs, tax allowances, tax credits). However, often content-related R&D does not necessarily qualify for such tax incentives. A prominent example is the case of R&D-intensive computer game development. Under many R&D tax incentive regimes, their applicability to games development is often unclear or changes would be necessary to satisfactorily cover these new types of research-intensive content development. In the UK, for instance, the Independent Game Developers Association is calling for a clarification and expansion of definitions in the R&D tax scheme.

Specific R&D support: Many OECD governments provide direct R&D support (grants, loans, public-private co-funding, and support for start-ups and small- and medium-sized enterprises, SMEs), encouraging innovation and research in developing broadband content.

As part of its Research Framework Programme and its *e*-Content Programme, the European Union (EU) is fostering cross-platform access to content, research in imaging technologies and audio-visual representation, multi-dimensional environments and virtual reality technologies.[9] The EU also has R&D programmes focussed on digital content creation and distribution (programmes for Networked Audio Visual Systems and Home Platforms and Semantic-based Knowledge and Content Systems) and access to and preservation of cultural and scientific resources. Through the Department of Trade and Industry's (DTI) Technology Programme, the United Kingdom provides "smart funds" to encourage innovation and research in developing broadband content (*e.g.* collaborative R&D for mobile content).[10] In Ireland, the 2002 Digital Content Strategy supports the industry particularly through R&D programmes. In France, the "Fonds à l'aide économique du multimédia (FAEM)" has a EUR 4 million fund to support prototypes. Canada has content-related R&D support[11] and Australia has called on the research and innovation systems to overcome the industry's fragmented nature.[12]

The promotion of R&D and the dissemination of results including the development of environments for storing and disseminating content data is part of Japan's "Promotion policy for content business" devised by the Office for Intellectual Property Strategy. The "e-Japan Priority Policy Program 2004" has developed multi-content multi-use technology aimed at protecting content-related rights, with high levels of freedom and convenience for use on personal communication networks. The Japanese Ministry of Communications (MIC) is also supporting R&D to develop technologies that enable efficient and secure editing and distribution of high-quality video content.

In Korea, digital content, embedded software, and telematics are recognised as major pillars for growth. The Korean digital content promotion policy includes R&D support for 3D graphic production capabilities, mobile content, infrastructure services (wire/mobile high speed network infrastructure), digital animation (3D content production), the construction of a Virtual Reality Development Laboratory, support for development of core digital content technologies (platform independent game software technology, development of core intelligent e-learning technology, mobile broadcast services, etc.) and standardisation. Technical protection measures (DRM, encryption, watermarking, etc.) are also supported as is the creation of a Foundation for Diverse Digital Content Support.

Other OECD governments are also identifying promising areas for focused research. In Austria, for example, technological and market studies are providing recommendations on how digital content engineering principles can be applied to improve the production and maintenance of digital content. Main research areas are: Semantic Web technologies and their application to multimedia information; knowledge-based search and retrieval technologies; digital content engineering; content management systems.

Sector-specific support schemes: Numerous support schemes for content creation and related technologies are sector-specific. For example, the French Government is offering grants toward development of new games, with the government paying up to 40% of their development costs.[13] Canada also has a pro-active strategy to attract and nurture the video and computer game industry. In the Asia-Pacific region there a number of government-funded approaches to game development.

Support schemes for mobile content: Mobile content applications and technologies are receiving special attention as regards R&D and technology development. For example, the EU Information Society Technologies work plan includes initiatives to stimulate mobile and wireless systems beyond 3G[14] and the development of applications and services for the mobile user and worker:[15] Finland's National Technology Agency allocated EUR 39 million for mobile entertainment projects, technology development and game production. The German MobilMedia Project provides EUR 15 million support, for example for a project (MoBüD) which provides public administration services to a mobile platform and another (Mobiko) to develop a mobile assistant supporting building constructors (*e.g.* displaying construction plans).[16]

Venture capital and financing issues

Production costs and investment risk of content creation are growing rapidly (especially audiovisual content such as films and games), and there may be funding shortfalls to develop digital content enterprises. Although a large share of venture capital goes to the ICT industry in general, access to risk funding and venture capital may be a barrier to content industry development. This is in part due to the intangible nature of content products, difficulties in assessing unknown markets and investment risk, and on the funding supply side due to a lack of specialised expertise among finance and venture capital providers. In the games industry specifically, it is also due in part to publishers wanting partly or fully developed products before signing contracts with developers, which places a heavy financial burden on small firms that self-finance development.

The high and rising cost and sophistication of content production (increasingly R&D-intensive) has implications for the related business environment and incentives / access to capital. From a business perspective the investment in a film or other content production is usually a very risky undertaking. Significant sunk costs are involved in audiovisual production with no certain returns and there exist large possibilities of failure and consequently inability to recoup the investment. This needs to be taken into account when discussing business models and the content industries' needs for finance.

Content financing issues have been recognised in many OECD countries. France has content financing initiatives in the games and movie industries, a report of the Irish government has recommended that a specialist venture capital fund for the digital content industry be established, and the European Commission has concluded that this topic merits further policy attention.[17] The Australian Government provides financing through the Australian Film Commission and Australian Film Finance Corporation although this funding is not necessarily only for content which is exclusively 'digital'. Finally, diversification of financing methods is also a key concern of the Japanese digital content strategy, including public-private partnerships to increase private commitment to start-up and initial funding.

Valuing digital content

Many OECD governments recognise the need to improve measurement of the structure, scale and progress of the digital content sector (see Section F below). As in other industries with high levels of intangible assets, inadequate measurement and reporting can underestimate the economic potential of new content firms and industries. The lack of appropriate information can affect a firm's negotiation power and business planning, and it has been suggested in debates at the OECD that more sophisticated ways to assess the value of digital content to firms and economies may be needed to improve the understanding of business opportunities and business models and enhance the micro- and macro-economic resource allocation (see in this context also the OECD report "Creating Value from Intellectual Assets" prepared for the Meeting of the OECD Council at Ministerial Level in 2006[18]).

Providing creative environments

Creativity underpins the creation of digital content and for certain governments the improvement of creative conditions is a policy priority. For example the Australian Department of Communications, Information Technology and the Arts has stressed the need to develop the right business and societal culture to foster creative and innovative content (appealing cities, quality lifestyle, diverse, open and tolerant environments, and access to high quality infrastructure, both public and cultural).

Skills, training, education

Digital content development and diffusion is a high-tech, high-skill industry. A key factor that will differentiate a company's products and services will be its skills base.[19] Most government studies identify

shortages of skills in areas of the digital content industry that appear to be the result of market failures, including informational difficulties in predicting demand for skills, and weak linkages between skills providers and emerging occupations. Shortages in training and education possibilities are also mentioned, and there are attempts to ensure that the output of the educational system (at primary, secondary and tertiary level) can help meet the current and future skills required to develop and sustain digital content industries.

Availability of skilled personnel: In the past there have been considerable mismatches between skill demand and supply for ICT skills in general and for software skills in particular. Digital content industries rely on substantial R&D and technological innovations, each requiring specialised skills. But educational institutions where some of these skills can be acquired are rare. In the games sector, for example, there have been shortages of designers and programmers specialising in particular areas of game design and development due to rapid growth in demand for such skills, shortfalls in domestic supply (lack of educational courses, little training within industry), restrictions on immigration of highly skilled personnel or difficulties in international sourcing of development tasks requiring large amounts of interaction among teams of developers. Furthermore not all of the skills needed are of a technical nature. Lack of management and organisational skills have been also seen as impediments to growth. Legal proficiencies, including for the complex management of intellectual property rights, are required.

Availability of training and education: Most ICT skills and other skills needed for the digital content industries are not obtained from formal degree courses of universities or tertiary institutions. This is in part due to the the rapid changes in specialist skills requirements compared with very long lead-times to change formal tertiary courses. Most skills are hence not acquired in formal education but usually on the job or in firm- or sector-specific training programmes. But smaller firms may find extensive in-house training too costly if it covers a wide range of specialist skills. To tackle skills shortages various OECD governments have aimed at developing more formal education and training programmes for digital content - both at the tertiary as well as at earlier educational levels. A study for the Irish government also recommends the development of digital media management courses, and creative components at the primary and secondary educational level and in the computer science programmes.[20] In Spain the Enterprise Digitalization Programme of Cataluna promotes education and training for digital content and supports ICT and content-related R&D specific to SMEs.

Availability of skills on the side of users: Education and skills are also needed on the side of the user. While firms strive to make Internet and content applications easy to use, basic ICTs skills are essential for consumer uptake. The education system may be a good source of basic digital competences and younger generations in OECD countries tend to be equipped with the necessary ICT skills.

Ensuring technological and other spillovers

Content delivery technologies and the content itself are increasingly relevant to non-entertainment sectors (such as business applications and public sector areas such as health and education). Technological spillovers from content-driven industries to other sectors include, for example, imaging technology, micro-payment systems and these spillovers are also increasing in business applications, health, public information systems, and other sectors. Spillovers can also arise on the use side: *e.g.* the use of computer and video games for education, learning and other social interaction, games imaging technology which can have potential use for architecture, design and engineering applications, and the use of games 3D-software in a range of training programmes and medical applications where interactivity is important.

Access to local content, diversity of content and language

Local content, culture and language: Culture and language issues are seen as important in the development of digital content, particularly for small countries and cultural minorities, and there is

significant government support for local content development where market failures have been perceived, particularly for information on content development and distribution. Goals are local identity, plurality, and cultural objectives. Government support ranges from sponsorship for local content providers at industry events, sponsorship of local or regional forums and fact-finding missions to raise local firm competitiveness, to government support to develop local content. Many OECD governments are sensitive to the need to develop intercultural dialogue and cultural diversity, and there have been international-level concerns of civil society and governments regarding the preservation of cultural diversity, living cultures and related creative capacity.[21] As the Internet has fewer access barriers and consumers have access to various content in a multi-platform and multi-channel environment, traditional support measures for local content and diversity are currently re-assessed in many OECD countries in the light of the Internet becoming a major content distribution platform (see OECD, 'The implications of convergence for regulation of electronic communications', DSTI/ICCP/TISP(2003)5/FINAL for more details[22]).

Examples of content support measures: EU-funded measures such as MediaPlus and the EU's eContent programme support the production and use of European digital content and they promote linguistic and cultural diversity on networks. The eContentplus programme 2005-2008 of the EU tackle fragmentation of the European digital content market (including multilingualism of content) and improve the accessibility and usability of geographical content. In France, the multimedia publishing aid fund managed by the National Centre of Cinematography (CNC). (a common initiative of the Ministry of Economy, Finance and Industry and the Ministry of Culture and Communication)[23] supports publishing projects, on line or on optical media, contributes to the production of original interactive content and favours the development of know-how. The aim is to support the development and the publication of interactive programmes, which have a commercial potential, and to contribute to the emergence of a sustainable economic sector. In 2004 these funds targeted broadband and other new technologies (ADSL and cable, interactive television, video-on-demand, mobile telephony). For video games, a joint call for projects has been launched by the French Ministry of Industry and the CNC.

The Canadian government provides funding to cultural institutions to hire new media graduates to produce digital content, and government support programmes for domestic content are undergoing significant overhauls with the arrival of digital content and a wide range of delivery channels and platforms. In Japan, the government funded a programme called 'Toward a Culturally-Oriented Nation', and various funds (*e.g.* Japan Arts Fund and Arts Plan 21) provide financial support. The Australian Advanced Networks Program supports the development and management of digital content, including sponsoring the production of short films in multi-episode format designed specifically for delivery to advanced mobile phones; development of a browser for video content, used to mark up video in the same way that text is currently marked up for Internet browsing and provision of high speed networking to demonstrate technical and financial models to access the wide range of archived high quality film and video content within Australia.

Access of regions and all communities: Inclusion of communities can be achieved through broadband content and the promotion of opportunities in remote rural areas. The UK's Department for Trade and Industry (DTI), for instance, influences regions to position broadband content and applications initiatives as part of their economic development. It is working with the regional levels in implementing initiatives to promote high quality content in business, learning, the public sector and communities. The Italian National Agency for Enterprise Development and Investments (*Sviluppo Italia)* which has the task to develop content, services and infrastructures also focuses on regions.

Accessibility and usability of content: Technologies and policy programmes to make content accessible to older or disabled people or to prevent "digital content divides" are being studied or developed in many countries.

Research concerning the use side: Social implications of digital content use and creation

Digital content is creating new user habits and a shift in focus from 'customer' to 'user'. The rise of new user habits and social attitudes, enabled by new platforms, new content services (online games, blogs, etc.) and the changing demographics of users are driving the change. Digital technologies enable individuals to create and use their own digital content and create social, cultural, and/or economic value for themselves, their communities, or their country.

Yet little is known about how consumers use digital content, and what behavioural and social effects such media consumption may have. Some governments have shown an interest in research into the societal and economic impacts of new content offerings.[24] Increasing interest is devoted to the new phenomenon of network users (and thus private households, students, etc.) becoming content creators through the Internet. The rise of blogs, podcasting, virtual communities, sharing of content, etc. has attracted significant interest (also with respect to its impact on cultural participation). For example, France is planning an Observatory to study the behaviour and expectations of content users/creators, measure available commercial digital content (music, film, games, publications etc.), analyse consumer behaviour with respect to digital content and their interrelationship with accessible hardware and the social characteristics of users, explore new uses of digital technologies (peer-to-peer networks), and assess links between digital and non-digital access to content.[25] The Italian Ministry for Innovation and Technology has promoted the e-Content Observatory which monitors the Italian market for digital content.[26]

B) VALUE CHAIN AND BUSINESS MODEL ISSUES

Business support, studies and co-ordination

Lack of knowledge concerning new business opportunities, lack of business models, lack of networking and industry collaborations, and a lack of export-orientation have been identified as barriers to the development of business around digital content. Identifying and diffusing knowledge with respect to these areas and bolstering industry collaborations are at the core of many OECD government policies for digital content, with a prominent role given to development agencies and industry associations.

Business intelligence and research: Useful information and data on the content industries is currently limited. While industry associations have an important role in conducting market research activities and providing a broad range of information and training to assist member firms, many OECD governments are involved in supporting their digital content sectors and policymaking with White Papers, market surveys and commissioned business intelligence. The UK government, for instance, conducted a Creative Industries Mapping Study and a competitiveness analysis of the UK games software industry. Norway has also commissioned studies to assess the framework conditions and establish statistics for digital content. The Australian Creative Industries Cluster Study provides an overview of the content industry, an examination of the role of government and a report on the economic benefits associated with Australia's cultural content assets. This is part of a broader Digital Content Strategy to accelerate the production, distribution and marketing of digital content and applications domestically and internationally. In Ireland, the goal was to raise awareness with the business sector by creating a "Digital Hub" (showcase for digital content) in order to market the capabilities and benefits of digital media/content to the corporate sector in Ireland.

Networking and information exchange, Public-private task forces and Cross-industry dialogue groups: The organisation of knowledge sharing in industry and the potential role of government to encourage this dialogue has been recognised through the creation of special public-private task forces (*e.g.* the Digital Content Forum in the UK). In some cases these groups set out to develop a list of action points for the digital content industries to be pursued by industry and government. In Ireland, a digital content steering group was established to develop sectoral knowledge and strategies. A working group of Finland's Tekes' Fenix Interactive Computing National Technology Programme is designed to contribute to the long-run competitiveness and know-how of the interactive computing industry. Australia's Action Agendas on digital content have as objective to increase the growth prospects of this industry sector by identifying the steps needed to develop and enhance sustainable competitive advantages. In Italy, the need for dialogue between the different stakeholders (telecommunication operators, content producers, content distributors, authors' associations, consumer associations, law enforcement authorities, collecting authorities) led to the establishment of an Inter-Ministerial Committee on digital content in July 2004.[27] In the context of the European Union proposal "i2010: European Information Society 2010" to foster growth and jobs in the information society and media industries, the EU's "Film Online" exercise is working with stakeholders towards an EU Charter of "Best Practices" for the take-up of on-line film and video distribution to be adopted in 2006. The US Government is engaged with industry advisory committees and *ad-hoc* groups on an array of policy issues and international dialogue relating to digital content.

Industry co-operation, linkages and clusters: The development of broadband content and applications requires closer collaboration between firms along the value-chain and between traditionally separate industries. As digital content markets develop and challenge existing business models, numerous participants are vying to control various parts of a complex and changing value chain. These include content owners and developers, content aggregators, mobile operators, handset manufacturers and various other companies offering enabling technologies. New emerging participants ("digital intermediaries") include aggregators, online content portals, and, for example, content encoding, hosting, billing and DRM providers. In some cases the new intermediaries include smaller less-established players which may have little leverage in the value chain.

Most studies show that at the time of writing there was little collaboration emerging across traditional industry sectors such as the content, the telecommunication and other related industries. The fragmented industry structure and lack of co-operation can however slow the adoption of new digital content products and long-term investment in the digital content sector. Increased co-operation between the different stakeholders would be beneficial to achieve the potential of new products and services.[28] To remedy this situation, many OECD governments have hosted dialogues among key stakeholders (see Networking and information exchange / Public-private Task Forces / Cross-industry dialogue groups). Some government studies note that there may be scope for promotion of collaborative mechanisms to overcome some of the disadvantages of fragmentation. Examples of this approach include, for example, in Australia, the creation of 'digital precincts' in some state capitals, and the Digital Content Industry Action Agenda which aims to improve industry co-operation and linkages across different industry sub-sectors. Multimedia Business Austria is an initiative by the Ministry of Economic Affairs and Labour aimed at increased participation in national cluster formation. ICT Ireland unites audiovisual federations, consumer electronics distributors, mobile telephone, content industries and other industry stakeholders in one industry association to facilitate this sort of integration. Some linkages can also be public sector-led (*i.e.* the public broadcaster commissioning a particular type of content which requires collaboration). It may be important that small firms be part of such clustering or linkage exercises. The MobilMedia Initiative in Germany, for instance, acts as a forum bringing together large companies and SMEs from the mobile community with prospective new customers for their product lines.

Export promotion and trade fairs: Access to overseas markets (*e.g.* facilitation of export marketing) has been identified as a major issue affecting the development of content industries. Small domestic market

size can be partly overcome by access to international markets. This often involves the localisation of export content, the adaptation of content platforms, the need for legal services, base points for overseas marketing, and the organisation of trade shows. While in many OECD countries this task is left to the industry, some OECD governments support their content industries in the quest to sell content overseas. This can involve general studies on the export potential of digital content industries[29], including studies and policies for particular content industries. Korea, for instance, has been particularly active in the area of policies that facilitate developing foreign language versions of Korean games and establishing co-operative networks for the distribution of games abroad and production companies (Korean Ministry of Culture & Tourism, 2004). The UK and Australian governments also provide support to attend big game trade shows to smaller games publishers.[30] Italy is also interested in the promotion of Italian content abroad, partly to serve Italian communities abroad in the original language. One of the objectives of the Australian Digital Content Industry Action Agenda is to promote exports and market access for digital content.[31]

Awards: Some governments have set up awards to encourage creativity (*e.g.* the Korean game contests "Best Games of the Month", "Korea Game Grand Awards").

Competitive, non-discriminatory framework environment

Competitive markets for telecommunication and digital content are an important ingredient for broadband take-up, high download speeds at affordable prices and the development of broadband content services. It is important to create contestable markets to permit consumers to purchase products at competitive prices, and so that control over parts of the value chain does not unduly restrict new entrants, or reasonable and non-discriminatory access to distribution channels or technology.

Market power of incumbent telecommunication operators may harm the above objectives. Moreover, with increasing levels of vertical and horizontal integration of the content and other industries (*i.e.* high degree of concentration of ownership and many examples of vertically integrated companies) competition is essential to ensure that industry participants do not foreclose content from new technological platforms. While vertical media mergers between content providers and delivery companies may allow economies of scope and offer new products and services to consumers, they may also create the risk of discriminatory access to content. Similarly, horizontal mergers may allow economies of scale, but they may also strengthen market power at the upstream and/or downstream level(s).[32]

Merger and other competition policies play an important role in development of the content market to carefully balance the positive business justifications against potential anticompetitive effects. In particular, market entry for smaller players is a focus of OECD governments. Nonetheless, regulation that impinges too far on a platform provider's ability to select content for quality control purposes or to meet market demand may be detrimental to the platform's development and may not improve market contestability.

C) ENHANCING THE INFRASTRUCTURE

Broadband access and policies

Broadband telecommunications infrastructure is a key enabler of the digital content industry since cost-effective access to high bandwidth is required for both the provision and use of digital content and applications to become widespread.

Universal, affordable access for broadband technology is a policy target in many OECD countries. In some OECD countries, such as the United States, the maintenance of a competitive environment for broadband and its widespread deployment is the key policy priority to indirectly stimulate the development of digital content. Ensuring effective competition and continued liberalisation in infrastructure, network services and applications is a key policy priority (*see* also the OECD Council Recommendation on Broadband Development) as the link between competitive wholesale telecommunications markets and broadband take-up / broadband content services has been demonstrated. Broadband policies to ensure (regional) coverage and access to infrastructure and applications across all levels of society (including schools) promoting access on fair terms and at competitive prices to all communities, irrespective of location, are being pursued. Special broadband infrastructure policies for rural and remote areas or for special broadband users (*e.g.* schools, libraries) and tax policies to lower the cost of broadband for consumers are being devised in certain OECD countries. The German Federal Ministry of Economics and Labour, for example, started the German Broadband Initiative in 2002 to ensure widespread broadband Internet access across Germany by 2005 and funded the initiative MEDIA@Komm to provide systematic support for the development and application of multimedia in towns, cities and local communities. The Australian National Broadband Strategy (2004) provides a policy framework for broadband development to deliver fair and reasonable access to broadband and its benefits by all Australians.[33]

Because of increasing convergence across different delivery platforms, more coherent and comprehensive regulations across these platforms are seen as an important policy objective in OECD countries.

Wireless services

The major licensed technologies include Global System for Mobile Communications (GSM), General Packet Radio Services (GPRS) and third generation networks (3G). Unlicensed, shorter-range technologies include wireless fidelity (WiFi), Worldwide Interoperability for Microwave Access (WIMAX), wireless local area network (WLAN), Radio Frequency Identification (RFID) and Bluetooth. Until recently, mobile networks did not provide sufficient bandwidth to guarantee a good user experience with more sophisticated digital content. Whereas most OECD countries now have a significant penetration of mobile handsets, frequent use of data-rich content services is still very much limited to Asian countries such as Korea and Japan. This has mostly to do with unattractive cost structures and unavailable mobile content services. Promotion of wireless broadband, particularly 3G or integrated unlicensed technologies, will further the development of mobile infrastructures that can support a broad range of mobile content, including video. For mobile and audiovisual content, access issues that also merit attention relate to available spectrum. Korea pursues the roll-out of Digital Multimedia Broadcasting (DMB) and the launch of Wireless Broadband (WiBro) services to facilitate mobile content distribution.

Broadcasting and cable policy

Another set of infrastructure regulations apply to broadcasting, cable and radio activities. Often these regulations were tied quite closely to content policies for the material delivered over these facilities. One reason for these close ties was the considerable influence that mass broadcasts had on the public at large. Originally tied to spectrum scarcity rationales and a corresponding scarcity of outlets, broadcast regulation focused on plurality and localism. Today, these policies vary considerably from one country to the next, and many OECD countries are currently reviewing their regulatory regimes.

Efforts in Europe and in the United States are aimed at eliminating disparities in the treatment between different infrastructure technologies. In Europe, the underlying transmission facilities are governed by the New Regulatory Framework (NRF) Directive, 2002/21/EC (2002), which is being implemented by each of the EU Member States to ensure technological neutrality. Content policies are

specifically excluded from the NRF directive. In the United States, the FCC recently attempted a comprehensive revision of its broadcast policies and rules that prevented cross-ownership of different media types.[34] As content industries develop, cross-ownership restrictions will significantly impact the nature of consolidation within the various industries that interact in the standard and mobile content value chain.

Convergence

Broadband and mobile content in particular are driving convergence between industries and technologies. In many OECD member countries, content policies vary depending on the specific platform over which the content is delivered. Earlier, telecom-, broadcasting-, media- and content legislations were developing separately.[35] Many OECD member countries are in the process of realigning their regulatory regimes to deal with convergence in light of the disparities that have arisen as Internet content has proliferated. There is also an increasing trend in some OECD countries to aim for a consolidated regulatory authority for broadcasting, telecommunications and other electronic communications. This process is consistent with the OECD Council Recommendation on Broadband Development's call to consider that convergence of platforms and services requires the reassessment and consistency of regulatory frameworks.

Next generation networks

Many OECD countries maintain programmes that aim at enabling growth of next generation networks (NGN) - *i.e.* the development of methods for the analysis and synthesis of communication networks, as well as design and construction methods for components and sub-systems. The role of policy is ultimately one of regulatory reform and providing a consistent regulatory framework to facilitate investment and the development of NGN-enabled services. The investment in NGN infrastructure, in turn, is usually carried out by major carriers.

Transition to digital / High definition television

Digital Television (DTV) technology allows broadcasters to offer television with movie-quality picture and CD-quality sound. The roll-out of interactive digital TV and organising the 'digital switchover' is a key policy consideration in most OECD countries. In Belgium, for instance, in 2010 most TV stations will diffuse content mostly in digital format and in 2012 analogue TV broadcasting will be stopped. This digital switchover is part of government policies to increase the use of technologies and to stimulate attractive content offerings (via public and private broadcasters). Interactive digital TV will also be used for offering government (information) services. In the United States, a significant number of television stations are already airing digital television programming, although they still must provide analogue programming until the target date set by Congress for the completion of the transition to DTV – 31 December 2006 or later if the date is extended. In the United Kingdom, the migration to DTV should be completed between 2008 and 2012 and in France, as of October 2005, the accelerated access of households to free digital terrestrial television has been declared a policy objective.[36]

Technology for digital content delivery, standards and interoperability

A diversity of interoperable content, standards and hardware are likely to prove most beneficial to competition and efficient online content markets. For maximum growth to occur, it is important that content management technologies (formats, digital repositories, metadata encoding) and technological protection measures such as copy controls, access control, electronic envelopes, encryption, watermarking, metering and monitoring of usage, and remuneration systems be developed and broadly adopted by all players in the value chain associated with online content delivery, and that they are utilised or implemented

in as interoperable a fashion as the various market sectors will permit. Standards may thus be needed for the content delivery platform (the hardware) and software (such as DRM).

As is the case for most new industries, the digital content industry faces a lack of product and technological standardisation. Numerous industry initiatives to promote interoperability and standardisation involving all players of the digital musical distribution chain are ongoing. Currently, however, the lack of standards or the rise of proprietary and incompatible standards may slow the development of digital content. There are also considerable lock-in effects due to the development of *de facto* standards. With vertical integration, lock-in of consumers in certain standards, and the difficult access to certain content, attention should be paid to maintain an environment where small and innovative players can compete. This may be an important guiding principle in related downstream areas of digital content distribution (*i.e.* software, DRM technology, hardware, etc.). In the case of online music, for instance, one has seen a rise of an increasing amount of proprietary formats (including audio codecs, DRM), networks, services, and consumer devices which could depress growth. On the one hand, some of these standards are an integral part of the business model and act as key facilitators for online music distribution while reducing piracy and increasing customer certainty. If there are no anti-competitive barriers to interoperability, proprietary standards may thus be beneficial to the development of the content market. On the other hand, while there are benefits to the adoption of standards, there are also potential costs, such as inhibiting later innovation and limiting possibilities for product differentiation. Standards can also provoke concerns about compatibility, transparency and unintended usage restrictions which may frustrate the user. In the case of mobile content, for example, handset manufacturers, content providers and mobile operators also lack a standard platform for the delivery of music or video.

Initial experimentation by the market place is needed to develop the best approach to standard setting. The content sector in particular has a strong incentive to promote interoperability. Governments usually do not have the experience and technological or other foresight to pre-select standards in fast-moving areas. Yet - aside from preventing anti-competitive practices and promoting innovation - governments can set up frameworks for industry co-operation and call on business, experts and standard organisations to develop standards. Efforts to create digital content standards (including for DRM, e-learning) and enhanced co-operation with International Standards Organizations are, for example, part of the new Korean growth strategy.

Infrastructures for micro-payment systems, electronic signatures, authentication

Effective and secure payment and authentication systems are needed for the development of the digital content market, both for fixed and wireless content access.[37] The major issue in the case of transactions with small payments is that credit card companies have minimum transaction charges. Alternative micro payment models have not yet attained wide coverage, although payments via mobile phone billing or prepaid phone cards are appearing as a viable option in some countries. The government can act as lead user in promoting the set-up of viable micro-payments systems. Cross-national payment remains a problem. Alongside technological innovations, the liberalization of existing regulatory frameworks or more fitting regulations may be needed to accommodate the rise of efficient payment systems. Governments can facilitate online payment solutions by clarifying the regulatory frameworks applying to non-bank payment intermediaries (such as mobile phone carriers, which plan to offer payment and credit functions) in countries and regions which have not yet done so. This is particularly crucial in the area of micro payments where non-bank intermediaries may play an important role in providing payment services related to content offerings. The Australian government has initiated a research project to investigate the longer term potential of the future electronic payments system for the Australian information economy.

Successful content deployment also requires that basic processes for end user identification, authorisation and payment be in place. To enable an end user to download digital content, there must be a mechanism for identifying the customer and recognising the device that is being used. Once identified, it is necessary to authorise the end user. Such authorisation is necessary to identify subscription users as well as to authenticate single-use items. Upon selection of content, users must be able to securely and easily pay for the content.

According to a Norwegian submission, one should not underestimate the example which governments can set by introducing and using electronic signatures and payment.

D) BUSINESS AND REGULATORY ENVIRONMENT

The OECD Council Recommendation on Broadband Development calls on two principles to allow for rapid and wide-spread broadband deployment and use that are important to the remaining discussion as regards the business and regulatory environment:

(i) Technologically neutral policy and regulation among competing and developing technologies to encourage interoperability, innovation and expand choice, taking into consideration that convergence of platforms and services requires the reassessment and consistency of regulatory frameworks.

(ii) Regulatory frameworks that balance the interests of suppliers and users, in areas such as the protection of intellectual property rights, and digital rights management without disadvantaging innovative e-business models.

Intellectual property rights

The advent of digital technology creates major opportunities but also challenges for digital content. Digital technologies could potentially create significant new markets, both for existing content and new 'added value' services based on existing content. But digital piracy may be an important impediment to the creation and strengthening of legitimate services to distribute copyrighted content on line. OECD governments have worked to promote the protection of intellectual property rights (IPR) through legislation (national law and international treaties), its enforcement, and increased criminal sanctions for digital piracy and related awareness/education campaigns (including youth education programmes).

The broadband content and services industry requires business models and technologies that provide effective copyright protection and exploitation while ensuring that the creative process is rewarded for the significant investment and risk taken in developing new content.[38] Frameworks that best encourage the creation of new artistic works are aimed for. It is thus important to find a good equilibrium of available legitimate and innovative uses of new technologies for online content and the necessary protection of associated IPRs while reducing online piracy. In devising IPR regimes, governments constantly have to strike a balance between setting the right incentives for creation and diffusion of protected works (including the respect for the interest/rights of rights holders and the interests/rights of users). The need for balance between the interests of suppliers, users, and innovation in areas such as the protection of intellectual property rights is called for in the afore-mentioned OECD Council Recommendation on

Broadband Development. The interactions between technological development and the effective protection of IPRs are thus of continued policy interest.

The policy environment surrounding legal IPR regimes is in flux. Important court cases (US Supreme Court in the case of Grokster and Australian Federal Court in the case of Sharman Networks/KazAa) that involved judgements against firms producing software which 'induced' unauthorized peer-to-peer file sharing have contributed to the debate about effective balance between protecting copyright and ensuring technological and business model innovation.[39] Another example of public debate surrounding new uses of content and the relationship to IPRs was the Google Print Project. With partner libraries from the University of Michigan, Stanford, Harvard, the New York Public Library, and Oxford, this Google project aims at making available a number of public domain books that were never subject to copyright or whose copyright has expired.[40] Google also planned to digitize and make searchable copyrighted works as part of their search and retrieval function. As the wholesale copying and digitisation of copyrighted works is necessary to establish such a service commercial publishers and others have expressed their opposition to such projects (i.e. if their consent is not sought after). This and other examples of the application of new technologies and new content uses, will lead to new opportunities and challenges as regards the interpretation and enforcement of IRP regimes.

Implementation of the treaties of the World Intellectual Property Organisation (WIPO): In December 1996, the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) (commonly referred to as the "WIPO Internet Treaties") were adopted by more than 100 countries. They adapt existing international copyright conventions to digital technology. Ratification of these treaties on a global level is a key priority for many countries. The ratification of the WIPO Internet Treaties into national law and the peculiarities of specific provisions are still a recurrent policy theme in many OECD countries (*e.g.* the transposition of the EU Copyright Directive into national law). EU Member Countries have or are implementing the "EU Directive concerning the harmonisation of particular aspects of the copyright and related rights in the information society (Directive 2001/29/CE)" which implements the WIPO Treaties. At the time of writing, the implementation of this Directive was at the heart of policy in France and Germany as the specific legislative drafts were being debated.

Liability of Internet service providers (ISPs) and other intermediaries: Many OECD countries are currently assessing and defining the liability and exemptions of ISPs and other intermediaries and 'notice and take down procedures' (content owner asking Internet intermediary to take down material because an alleged violation of copyright law is occurring) as regards the unauthorised downloading of copyrighted material. Some OECD countries have addressed these issues in their legislation. The US Digital Millennium Copyright Act (DMCA) also creates a legal process for ISPs to co-operate in taking down infringing materials from their systems or networks. Australia, for instance, introduced a new Internet Service Provider (ISP) liability scheme as a result of legislative changes following the United States-Australia Free Trade Agreement. The scheme establishes a prescribed notice and takedown procedure which allows copyright owners to notify ISPs of suspected copyright infringements occurring on their systems or networks. To take advantage of the limitation on remedies available under the scheme the ISP are required to expeditiously remove access to the material or link, as well as comply with a range of other conditions. The "EU Directive on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market" (Directive 2000/31/EC) defines the strict conditions under which a services provider can be held liable for third party illegal content, when acting as an online intermediary.

Technological Protection Measures (TPMs): The WIPO treaties contain language requiring ratifying states to prevent circumvention of technological measures (such as DRM technologies) used to protect copyrighted works, and to prevent tampering with the integrity of copyright management information.[41] These obligations serve as technological adjuncts to the exclusive rights granted by copyright law. Their

purpose is to provide legal protection to works on digital networks. A large number of OECD countries have strengthened their laws against the circumvention of TPMs in addition to laws against the manufacture and dealing in devices used to circumvent TPMs and the provision of services that circumvent TPMs. This is the case in the EU, where the Directive 2001/29/CE requires EU Member States to provide adequate legal protection against circumvention of TPMs and DRMs. These often include exceptions, *e.g.* for special cases involving non-profit libraries, archives, educational institutions, reverse engineering, encryption research, personal privacy, and others (see *e.g.* the US Digital Millennium Copyright Act. Debate is ongoing about how far TPMs unduly restrict usage, interoperability, etc. (c.f. the sections on standards and DRMs).

Copyright term extension: Some OECD countries have extended the duration of copyright. For instance, as a result of legislative changes following the United States-Australia Free Trade Agreement, Australia has extended the duration of copyright in works (including computer software), sound recordings and films by 20 years to the life of the author of the works plus 70 years and 70 years from the publication of sound recordings and films.

Fair use review: International obligations (*e.g.* the three step-test of the Berne Convention and TRIPS) provide room for countries to adapt and implement copyright laws in a manner that accords with national interests. 'Fair use' may include exceptions providing for the use of and free flow of information for educational or cultural purposes, the promotion of innovation, research and development activities, and other 'fair uses' of content confined to special cases (*e.g.* persons with disabilities). Some OECD governments, like Australia, are reviewing whether specific exceptions to copyright based on principles of 'fair use' should be adapted and/or adopted in light of the digital networks.

OECD countries have arranged for exceptions or limitations in the public interest for the purpose of education and teaching (see, for example, the EU Directive on the harmonisation of certain aspects of copyright and related rights in the information society). Projects are ongoing that analyse ways in which digitization alters the use of content by teachers and scholars in their educational mission; what obstacles (legal, technical, or institutional) prevent the full potential of digital learning; and what reforms might improve the situation. This includes seminars analysing the flow of educational materials (including to developing countries) and devising copyright exceptions for education.[42]

Complex rights negotiations: Managing IP rights globally continues to be a major challenge for content providers and distributors, including mobile operators. Although the process of obtaining rights for the legitimate sale of online music and remuneration of artists is necessary and important, the high business costs and administrative burden of clearing intellectual property rights for country-specific online music services has been raised as an issue potentially slowing digital music distribution. The lack of experience in managing digital rights appears to be a barrier for a number of firms in the industry. SMEs are often said to have a problem protecting their IPRs, and navigating complex IPRs.

The fragmentation of the online music market due to rights' negotiations for different national territories has been recognised as an issue in many OECD countries. The artificial division between the licensing of public performance rights and the licensing of reproduction and distribution rights complicates the rights negotiations. There is a growing consensus that the unavailability of certain musical compositions and the increased transactional costs engendered by this antiquated and complex system prevent the music industry from being able to combat piracy. Reforms of the process for licensing online distribution of musical works are being debated. As a result, the EU Work Programme 2003/2004 of the EU e-content programme recognises that the 'effectiveness and efficiency of the multimedia rights clearance have a strong and direct impact on the functioning of the content industries in the digital world'. After a study on a community initiative on the cross-border collective management of copyright, the European Commission has also recently adopted a recommendation on the management of online rights in

musical works. The recommendation puts forward measures for improving the EU-wide licensing of copyright for online services.[43] The facilitation of digital music licensing is also being debated in the US (*e.g.* in the US House of Representatives; Committee on the Judiciary; Subcommittee on Courts, the Internet, and Intellectual Property[44]).

Conduct by value chain participants and governments: Various initiatives to reconcile value chain participants around the creation of online business models and the reduction of online piracy have been conducted. The French government, for instance, installed an Anti-piracy Action Plan which involves an agreement between French ISPs and French groups of right holders, including the French recording sector, to fight online piracy and to promote the development of legal online music site. In March 2005, the Italian government has promoted the so-called San Remo charter for the adoption of a coordinated set of codes of conduct by the content industry, ISPs, network operators, manufacturers and rights owners, to foster the availability of quality in a secure environment, and to organise and promote educational campaigns, in particular amongst youth, to ensure the respect of digital rights.[45]

Other IPR-related issues: In the context of the OECD music and other digital content studies, various other IPR-related issues were identified that could pose obstacles to development of new business models, and where further work may be needed (see Box 1 for some issues).

Box 1 Potential obstacles to online business models

- High incidence of copyright infringement involving unauthorised digital distribution of copyright content on line, with harmful effects on music, audiovisual and software industries.
- Differences in the nature and scope of limitations and exceptions to copyright across jurisdictions (*e.g.* exceptions for the benefit of disabled people, illustration for teaching or scientific research, reproduction for information purposes, and ephemeral recordings by broadcasting organisations), creating uncertainty as to which uses of music might be exempted (free) in multiple territories.
- Differing approaches to establishing copyright liability of Internet intermediaries, including Internet Service Providers, across jurisdictions.
- Different national approaches to ensuring that beneficiaries of exceptions and limitations have access to digital copyright content to which technological protection measures (TPMs) have been or may be applied.
- Differences in the scope of individual privacy rights and data protection legislation across jurisdictions, resulting in different practices for gathering of personal information in the course of applying DRM solutions, or for purposes of enforcement of copyright.
- Multiplicity of rights clearance and cross-border licensing processes, creating uncertainty as to which rights have been cleared for digital delivery in each territory.

Source: Adapted from Box 6 of OECD (2005), Digital broadband content: Music, DSTI/ICCP/IE(2004)12/FINAL, www.oecd.org/document/46/0,2340,en_2649_34223_34994926_1_1_1_1,00.html.

Digital rights management (DRM)

Effective DRM technologies have been seen as business enablers for the digital distribution of content and for the variety of new business models that consumers may want. Through their ability to create diverse access schemes to content, DRMs may enable content offerings that are more tailored to consumer demand (*e.g.* the right to purchase time-limited access to songs) and that may – if prices reflect the level of access – increase consumer choice, satisfaction and overall economic welfare if price discrimination expands markets.

Several problems still exist in relation to DRMs. First, one of the central problems with DRM's seems that in the past they have - at times and despite of their recognised function as a deterrent - failed to prevent unauthorised uses. DRM technologies may have to be sufficiently robust to ensure that digital content cannot be subjected to unauthorised copying or unintended uses. To remedy this situation, many governments have - through the signing of the WIPO Treaties - pledged to create "adequate legal protection and effective legal remedies against the circumvention" of technological protection measures such as DRMs. Second, with some stakeholders the increasing use of DRM technologies has raised the question if the latter could potentially limit usage rights. This topic has become a consideration notably for consumer associations (The European's Consumers' Organisation, BEUC[46]) and is reflected in relevant conferences[47] and consumer surveys.[48] According to some academics, limits set to private copies can be troublesome when they shift the balance between copyright holders' interests and the public's (Gasser, 2004).[49] Research into the impact of current and proposed DRM technologies on consumers' existing rights, technological innovation, and the effectiveness of DRM in protecting rights holders' intellectual property rights (including privacy protection) may thus be warranted.[50] But it is also worth noting that market forces (*e.g.* consumers voting with their purchasing behaviour), growing experience of content and technology providers with DRMs and technological developments may address some of these issues. As DRM technology develops and content service providers learn about consumer preferences, DRM may become more sophisticated, more flexible and provide support for innovative business models.

Many OECD countries are active in conducting internal reviews of DRM issues. The European Commission, for example, has been involved so far not only in setting norms, but also as a facilitator in promoting a dialogue between stakeholders (manufacturers, copyrights holders, collecting societies, consumers). In 2004, it set up a High Level Group on DRMs which delivered a report in July 2004, and finalised its work in April 2005.[51] The European Commission also set up the INDICARE project (The Informed Dialogue about Consumer Acceptability of Digital Rights Management Solutions) to address the consumer side of managing rights.[52] Some government studies note that there may be a role for government or industry collaboration to further clarify and inform the industry about digital rights negotiations and management.[53]

Some OECD governments are involved in setting standards in relation to DRM. In the United States, for instance, the Federal Communications Commission (FCC) has initially been involved in trying to define the so-called 'broadcast flag'; a piece of embedded software to mark digital broadcast programming so as to limit its improper use.[54] It was felt by broadcasters that the current lack of digital broadcast copy protection may be a key impediment to the transition's progress. Finally, Japan has released a study on introducing infrastructure technology for general purpose metadata structure which will facilitate the copyright clearance system.

Security and privacy

Security and privacy are key areas of policy and regulation pertaining to electronic commerce, including the delivery of mobile content on line. Anti-spyware and anti-phishing measures which would be supplementing existing anti-spam initiatives are under consideration in many OECD countries. The OECD Council Recommendation on Broadband Development specifically recognises that it is important to implement "a culture of security to enhance trust in the use of ICT by business and consumers, effective enforcement of privacy and consumer protection". Extensive policy work has already been undertaken at the OECD in these fields.[55] The OECD Guidelines, and subsequent guidance for privacy on line, offer recommendations concerning the collection and management of personal information, which are applicable with regard to any technology used for collecting and processing personal data.

As concerns the security of information systems and networks, which is equally important for delivering mobile content, the 2002 *OECD Guidelines for the Security of Information Systems and*

Networks: Towards a Culture of Security call for a greater awareness and understanding of security issues. In addition, work on spam policies is proceeding at OECD and in many OECD member countries. OECD has set up a Task Force on Spam which is examining potential solutions that can be taken at the international level to help combat spam (see www.oecd-antispam.org).

Consumer protection

The WPIE digital content sector studies have raised various issues that may be of interest from the perspective of consumer protection (*e.g.* limited terms of usage rights, interoperability problems). In the area of consumer protection, the OECD Council Recommendation on Broadband Development calls for policies that ensure consumer protection, including cross-border co-operation. Work is underway by the Committee on Consumer Policy (CCP) to examine new services that take advantage of mobile communications technologies, but which may raise consumer protection issues regarding, for example, the effectiveness of information disclosures on small screens, the use of mobile devices as a payment mechanism and issues related to the protection of minors. Examination will take into account the *OECD Guidelines for Consumer Protection in the Context of Electronic Commerce* (1999). The CCP has also issued a report (DSTI/CP(2005)15/FINAL) examining the adequacy of disclosure to consumers of technically imposed restrictions on the use of digital content. It focuses on the application of copy control (CCT) and digital rights management (DRM) technologies in three areas: copy-protected CDs; online music, and DVD regional coding (available at www.oecd.org/dataoecd/47/31/36546422.pdf).

Content regulation

OECD governments have to rethink many aspects of content regulation. Essentially the questions are which content should be regulated in which way.

Content regulation over various platforms: Through technological and industry convergence the same content can increasingly be delivered over different technology platforms and services. Technologically neutral policies would ensure that the same content gets the same regulatory treatment.

The development and application of digital technologies, combined with other developments in broadcasting markets, are changing the traditional broadcasting model and leading some OECD countries to review their regulations on audiovisual content. In the EU, for instance, the European Commission launched a modernisation of rules on audiovisual services by proposing a revision of the "Television Without Frontiers Directive" at the end of 2005. The existing Directive allows the creation of conditions necessary for the free movement of television broadcasts (irrespective of being analogue or digital) among the members of the European Union. It aims to achieve this by providing that Member States of the European Union cannot restrict reception or retransmission of broadcasts from other Member States for reasons falling in the areas co-coordinated by the directive; these cover the promotion of European works and works by independent producers, advertising, the protection of minors and public order, and the right of reply. The EU Directive also ensures that events which are regarded by a Member State as being of major importance for society may not be broadcast in such a way that a substantial part of the population of that Member State is deprived of seeing them. Modernisation of the EU Directive aims at making sure that these regulatory objectives would be met in a digital environment where the development and application of digital technologies combined with other developments in the broadcasting markets are changing the reality of European broadcasting.[56]

Harmful and illegal content: Counteracting illegal and harmful content on the Internet is a priority for many OECD governments. It is often felt that children need to be protected from being exposed to undesired and potentially harmful content on the Internet. The ‘Recommendation of the Council of the European Union on the development of the competitiveness of the European audiovisual and information

services industry' aims at achieving a comparable and effective level of protection of minors and human dignity covering all forms of delivery, from broadcasting to the Internet (including guidelines for the establishment of national self-regulation frameworks to complement rules on liability of content providers). The Action Plan on promoting safer use of the Internet is one of the Community actions implementing the Recommendation. Information and attitude-building projects (for example, Safety and Awareness Project, SAFT, in Norway) will contribute to this goal. Co-operation between industry, education, governments and enforcement is important to reduce harmful and illegal content. The Danish government, for instance, recommends that institutions offering Internet access to the public should introduce a policy for Web ethics so as to offer children the best possible protection.

In general, there is insufficient understanding of how media consumption generally affects brain processing, learning, attitudes, and behaviour (*e.g.* the impacts of violent games on behaviour, the impact of games on learning). More research may be warranted in this field.

Age ratings: Rating systems are seen as important to ensure protection of minors from content judged unsuitable for their age. Recognised clear rating systems allow protection of minors. A number of countries have focused on providing age rating systems, including government or industry self-regulatory initiatives to develop national and trans-national rating systems (*e.g.* the cross-national European age rating system PEGI (Pan European Game Information). Age ratings and their effective implementation through technological innovations (filters, etc.) merit consideration.

Fostering legal frameworks adapted to online digital content distribution

Inadequate legal and regulatory frameworks may limit the growth of Internet content, increase the cost of doing business and creating uncertainty in the market place. The online distribution of services and content is a relatively new phenomenon and consequently legal frameworks for such transactions may need to be revisited. Creating and increasing the use of (cross-border) e-services thereby adding the value to content, and improving the transparency and quality of service is a key consideration to OECD governments. While all OECD governments have taken steps to adapt their regulation of e-commerce/digital delivery, issues such as electronic signatures, rights protection technologies (watermarking, encryption), secure payment systems, privacy protection, taxation, illegal or harmful content have been voiced as key concerns of market players and governments.

Taxation issues and fiscal environment specific to digital content

Value-added tax / Consumption-tax - Incidence and applicable tax regime: Tax policies can significantly influence the development and uptake of digital content. As content developers and distributors look to global markets, managing the variety of taxation regimes can become costly. The question is whether content delivered on line is subject to value-added, consumption and/or sales tax and which tax regime applies in the case of international transactions (including in the mobile context). The 1998 OECD Ottawa Taxation Framework Conditions provide that consumption taxation of cross-border electronic commerce should result in taxation in the jurisdiction where the consumption takes place. This, whilst preserving tax neutrality, raises practical difficulties in ensuring collection of consumption taxes on cross-border business-to-consumer transactions of electronic services and intangible products.[57]

Taxes levied on offline and online content distribution can vary between OECD countries. From the point of economic efficiency, however, the most important would be that taxes are effectively neutral as to their delivery (the same tax no matter whether physical or digital distribution). Some OECD countries have put in place certain tax measures that directly affect e-commerce and the sale of digital content products. The Unite States, for instance, has a put in place a temporary moratorium on Internet access taxes since 1998 (Internet Tax Freedom Act), temporarily banning taxes on Internet access and multiple or

discriminatory taxes on e-commerce.[58] More specifically with respect to digital content products, new EU legislation[59] specifies that, after July 2003, non-EU suppliers of digital content products are subject to the same value-added tax as EU suppliers when they are providing electronic services to EU customers.[60]

E) GOVERNMENTS AS PRODUCERS AND USERS OF CONTENT

Besides assisting third-party use and creation of content, governments also have important roles as producers and users of content.[61]

Governments putting public content on line

The public sector is a large content producer (including data/information, images, film, etc., excluding administrative and e-government content, and personal data). Publicly funded digital content is, in some cases, not easily accessed by the general public. This content is potentially valuable for established and digital content applications and value-added services for commercial and non-commercial use. Governments also generate very large amounts of content that is susceptible to be used over mobile platforms. The overall objective is to use outstanding government content to push the market forward, provide good services, and establish good access to public content resources.

Government efficiency, structural reforms and modernisation, transparency, and enhanced access to public services, can also be further developed through *e.g.* providing public information, collecting taxes or procuring goods and services on line, as well as fostering e-health and e-education. Often this calls for a mindset change in the public sector and a rearranging of the structure of public information. Challenges are in changing budgetary practices and public sector culture for information sharing. Establishing the necessary national legislation, guidelines and governance principles are a key concern. Governments can also act as model users in the area of electronic signatures, payment, etc., potentially leading to standardization effects.

Commercial re-use of public sector information: This entails policy initiatives and laws that facilitate the commercial re-use of public sector information (*e.g.* geographical, meteorological, traffic, business, and economic, social, educational data).

The United States has a history of facilitating access and commercial re-use of public sector information. Currently, many EU countries are implementing the EU Directive on the re-use of Public Sector Information which strives to increase commercial re-use. It is built around five main ideas: *i)* Minimum harmonisation to facilitate cross-border use; *ii)* Transparency of conditions; *iii)* Avoid abuse of market power, *iv)* Non-discrimination, *v)* Clear procedures, lists of assets, online licenses. It excludes cultural public sector content. In Norway a comprehensive scheme for access to public sector information is being established which involves suggestions for a general rearranging of the structure of public information. In June 2005, the Danish Parliament passed a law on the re-use of public sector information among citizens and businesses that further improves access to data for the private sector and sets marginal cost as the maximum price for data. In the Czech Republic the so-called Portal of Public Administration integrates the spatial data of governmental institutions.[62] After the implementation of the EU PSI Directive, Hungary now makes available weather information, such as meteorological measures, observations and telegrams which are freely downloadable from the Web site of the National Meteorological Service. The Swiss e-geo.ch project establishes a national geo-data infrastructure with a view to networking the data,

facilitating access and encouraging its use. Austria, the Czech Republic, Slovakia and Hungary have launched a joint initiative to promote digital content - a series of workshops on digital content, public sector information, geographic information systems, cultural content will be organised in these countries.[63] Italy has published a study on the value of public sector information in the spring of 2006.[64]

Increasing the accessibility of other public sector content (*e.g.* from educational and research establishments, public service broadcasters, and cultural establishments)*:* Providing co-ordinated access to research data, cultural and educational public resources is an important policy objective. It is felt on many occasions that state-controlled content companies (especially in broadcasting) should be encouraged to move towards the digital creation, management and distribution of their content while respecting the right of various stakeholders in such content.

In the United States, Europe (France in particular) and many other OECD countries digitisation efforts of libraries, museums and archives are being carried out. In September 2004, the European Commission also unveiled plans for European digital libraries.[65] In 2003, the National Library of Australia prepared *Guidelines for the Preservation of Digital Heritage* to form part of UNESCO's campaign to improve access to digital heritage. The National Archives of Australia and the National Library of Australia also provide guidance on preservation of, and access to, digital content including: digital recordkeeping and digitisation projects through the Australian digitisation project Web site. The National Library is also participating in the Australian Partnership for Sustainable Repositories Project which aims to develop demonstrator repositories and support continuity and sustainability of digital collections, including research data sets. In 2004-05 Australian institutions including the National Library of Australia, National Archives of Australia, National Museum of Australia, National Gallery of Australia and the Australian Film Commission collaborated in preparing a National Digital Collection Strategy as a principles-based document to guide future development activity. The Digital Content Working Group of the National Broadband Strategy Implementation Group has scoped an *Audiovisual Australia Project* for wider consideration.[66] In New Zealand, EPIC is meant to provide access for all New Zealanders through their libraries to e-content.

In the field of cultural heritage, the Manuscriptorium project of the Czech Republic which aims to preserve ancient manuscripts and to complete the digitalisation of old documents, has been launched in co-operation with The National Library.[67] Other examples are that under the Danish Ministry of Culture programmes of digital content have been developed, including the Danish Archival Information System (DAISY) making the holdings of The Danish State Archives available. The Danish National Cultural Heritage Agency has the responsibility for managing and developing an online National Sites and Monuments Record.[68] The common access system is also used to give access to licensed online music to everyone in Denmark through the libraries' Netmusic.[69] In France, the 'Programme national de numérisation du ministère de la culture et de la communication' has launched a call for tender aimed at public and non-profit organisations to explore digitisation of national collections of documents and audiovisual works of national importance.[70] The Belgian 'Plan de digitalisation du patrimoine scientifique et culturel des Etablissements Scientifiques Fédéraux (ESF)' of the Ministry of Science and the Royal Belgian Cinematography plans to invest about EUR 150 million to digitise important works, to establish a complete catalogue of available work, the facilitation of search, the development of metadata and the on line availability of this content.

The Common Archives project of the UK's BBC intends to make available a large BBC film catalogue for free non-commercial use. The NDDA is a distributed network of archives that makes Hungary's national cultural assets available in a digital form for a wide range of users.[71] The Hungarian National Audiovisual Archive (NAVA) now also provides on line access to its collection and it also helps in processing local broadcasters' archives.[72] Australia has also initiated a number of programs to preserve and promote access to its cultural heritage material in digital format and promote access to material

reflecting and maintaining Australian culture and values. The Culture and Recreation Portal provides access to online services such as News and Events and information from over 3 500 Australian Web sites in the fields of culture and recreation spanning government and non-government sectors, receiving over 3.5 million visits per annum. An estimated $3 million per annum is invested in digitisation activities of collections housed by the national collecting institutions. Initiatives are in progress across all collections domains (including archives, galleries, libraries and museums) to digitise culturally significant material and to provide online access.[73] New Zealand offers an online Cultural Portal.[74] In addition, the Digital Strategy's Community Partnership Fund initiative is available as a potential source of funding to digitise local and valuable content.

Finally, Japan is also in the process of setting up digital archives on cultural heritage while driving the standardisation of the use of meta-data (title of work, author, information on right holders and conditions for use) to improve the possibility of searching, browsing and utilisation of digital archives within and across various museum and government databases (see also section on IPRs).

The dividing line between allowing for commercial re-use and making public sector content available to the general public is sometimes hard to draw as governments do both at the same time. Korea, for instance, is digitizing publicly important knowledge information resources. The strategic areas of knowledge information resources are: science and technology, education and academy, culture, and data from social welfare and industrial economy. While Korea first focuses on resources which are "high on public value but low on commercial value", the next step of the digitisation effort focuses on knowledge information resources with higher industrial impact. The EU *e*Contentplus programme (2005-2008) also focuses - at the same time - on improving creation and use of cultural, educational, scientific and spatial content and providing access to and preservation of cultural and scientific resources.

Public broadcasting: In many OECD countries there exist fully or partially state owned broadcasters which are government financed or subsidised. These broadcasters produce content, which may (or may not) be used by private companies or other public actors like schools etc. depending on the accessibility of the content and usage rights. Public broadcasters also stand before the challenge of digitising and making available their content more widely (back archives and similar initiatives like the above-mentioned BBC experiments). In Switzerland, for instance, it was questioned before Parliament whether public broadcasters should not open their archives for free for other broadcasting companies, because their productions were funded by tax incomes and fees.

Governments as content users, demand promotion and aggregation

The public sector also has a major role, both as a customer (*i.e.* government as model user) and as a channel for aggregation of broadband demand, to push broadband usage and capacity to new levels.

Promote demand through public demand aggregation and private demand promotion (including e-learning): Parts of the creative digital content industries, particularly the tourism, health and educational content sector are largely reliant on the government sector as a customer. Moreover, broadband procurement of the public sector can be used to achieve policy objectives. These circumstances can be used by OECD governments to promote public demand.

The United Kingdom, for instance, is issuing guidance on broadband content procurement to facilitate more effective procurement of Broadband Content by the public sector. *Innovazione Italia* is launching promotion policies for digital content by increasing "critical mass" to increase the number of content users in Italy through enlargement of supply. It develops projects that stimulate public demand (*e.g.* school education) and private demand (*e.g.* Guidelines for digital content in school education). The Italian Government is also using digital content in schools to change teaching methods (*e.g.* making use of

media/games software to provide innovative learning). In New Zealand, the Digital Learning Materials Development Project aims to develop digital learning objects with major cultural and heritage institutions (Te Papa, National Library of New Zealand, TVNZ). The Ministry of Education of the Czech Republic has also launched a Web application for educational content. Teachers may also use the web to access educational content and exchange opinions on the instruction materials in terms of their practical use.[75] The Czech Government also plans to support the development of broadband content and services by co-participating financially in projects at a public administration or non-profit organisation level. Such projects are supposed to stimulate the demand for broadband from different users, in particular in the fields of healthcare, education, and culture and also for dealing with self-government business.

Participate in development of specific content: Through R&D, more direct financing support and other measures touched upon earlier, governments can actively participate in the development of specific content. Co-financing possibilities are used not only to support infrastructure in less favoured regions but also to support the demand side in the information society (including the support of SMEs, computer literacy, *i.e.* the development of ICT usage skills). As part of the IST Framework programme and e-content plus of the EU, many EU Member States have programmes to support digital and multilingual content. This entails the support of the creation of digital content infrastructure. Greece, for instance, supports the development of products and services for the Information Society with priority on the emerging industry of electronic information content (cultural heritage, educational programmes, and entertainment). The development broadband content in the health sector is of importance to many OECD countries.

Knowledge creation and distribution: the case of scientific publishing

In addition to making the content of libraries, archives, museums and other institutions available on line, OECD countries emphasise the importance of access to the stock of scientific and technological research information. Research and innovation are undergoing radical reassessment and becoming central to public policy in knowledge-based economies, increasingly focusing on improving knowledge transfer and supporting innovation and commercialisation. With increased awareness of the importance of knowledge creation and distribution, there is widespread interest in realising the benefits of digital delivery and maximising returns on investments in R&D through enhanced access to research data/findings and scientific publications.

- *Research funding*. Public funding and funding agencies are very important in R&D and related activities that generate research data, databases and scientific publications.

- *Advanced networks to benefit research.* Like in the case of Australia, Advanced Networks Programs can allow researchers in the public and private sectors to explore potential information-rich services using very large bandwidth.

- *Access to public and government-funded content* is a crucial issue, and there is considerable potential for governments to provide a lead in enabling digital delivery and enhanced access to publicly-funded scientific and technical information. The principle is to enable maximum access to findings from publicly funded research to maximise social returns on public investments. The OECD Science Ministers declaration of January 2004 asked the OECD to work towards the establishment of access regimes for digital research data from public funding (see Box A.1 in the Annex). At that meeting, Ministers recognised that fostering broader, open access to and wide use of research data would enhance the quality and productivity of science systems worldwide, and they adopted a Declaration on Access to Research Data from Public Funding.

Another recent development to have gained considerable momentum has been open access, principally in the forms of open access publishing / archives supported by grants and donations or author

charges and various hybrid models, and open access archives and repositories. Many governments and public institutions, as well as the industry, are exploring new ways of digital access to scientific information. Annex 1 of the WPIE study on scientific publishing (DSTI/ICCP/IE(2004)11/FINAL) reviews some of the current initiatives. The US National Institutes of Health, for example, are increasingly providing free access to funded research.

F) CONCEPTUALISATION, CLASSIFICATION AND MEASUREMENT

Many OECD governments recognise that there is a need to improve the way digital content is measured (especially the structure, scale and progress of the digital content sector does not seem adequately captured). Various government presentations stressed that lagging statistical indicators mask the economic potential and implications of emerging industries and trends, affecting both business issues and the government policy setting. It was felt that there is a need for more systematic collection, research and analysis of information on these industries (presentations from Australia, United Kingdom, Norway, etc.).

There are two major conceptual and classification challenges in defining and analysing the development of digital content:

1. Current statistical classifications do not capture many of the new activities or fully identify established activities that are now developing digital content. Existing classifications overlap, or there is a total absence of classification which makes it difficult, if not impossible, to define digital content activities in a way that is mutually exclusive and collectively exhaustive.
2. Digital content spans both traditional content-producing industries (*e.g.* publishing, audiovisual, etc.) and those that produce digital content/information-rich products as part of their activities, but have so far not been perceived as content-producing industries.[76]

Two more (albeit related) problems are: Different countries (and even different organisations within countries) have different definitions of digital content and what sub-sectors the definition includes. And digital content may (or may not depending on one's definition) exclude analogue content, which still accounts for a large percentage of output in some sub-sectors such as film and publishing, making it a definition based on technological differences.

Some degree of harmonisation of definitions across jurisdictions would improve the reliability of "digital content" metrics and the robustness of comparative statistics. Development of appropriate measures/metrics for benchmarking broadband content will also aid policy development and analysis.

Box A.1 2004 OECD Ministerial Declaration on access to digital research data from public funding

On the 30th January 2004, 34 governments committed to work towards the establishment of access regimes for digital research data from public funding in accordance with the following objectives and principles:

Openness: balancing the interests of open access to data to increase the quality and efficiency of research and innovation with the need for restriction of access in some instances to protect social, scientific and economic interests.

Transparency: making information on data-producing organisations, documentation on the data they produce and specifications of conditions attached to the use of these data, available and accessible internationally.

Legal conformity: paying due attention, in the design of access regimes for digital research data, to national legal requirements concerning national security, privacy and trade secrets.

Formal responsibility: promoting explicit, formal institutional rules on the responsibilities of the various parties involved in data-related activities pertaining to authorship, producer credits, ownership, usage restrictions, financial arrangements, ethical rules, licensing terms, and liability.

Professionalism: building institutional rules for the management of digital research data based on the relevant professional standards and values embodied in the codes of conduct of the scientific communities involved.

Protection of intellectual property: describing ways to obtain open access under the different legal regimes of copyright or other intellectual property law applicable to databases as well as trade secrets.

Interoperability: paying due attention to the relevant international standard requirements for use in multiple ways, in co-operation with other international organisations.

Quality and security: describing good practices for methods, techniques and instruments employed in the collection, dissemination and accessible archiving of data to enable quality control by peer review and other means of safeguarding authenticity, originality, integrity, security and establishing liability.

Efficiency: promoting further cost effectiveness within the global science system by describing good practices in data management and specialised support services.

Accountability: evaluating the performance of data access regimes to maximise the support for open access among the scientific community and society at large.

They also pledged to: seek transparency in regulations and policies related to information, computer and communications services affecting international flows of data for research, and reducing unnecessary barriers to the international exchange of these data; take the necessary steps to strengthen existing instruments and – where appropriate – create within the framework of international and national law, new mechanisms and practices supporting international collaboration in access to digital research data; support OECD initiatives to promote the development and harmonisation of approaches by governments adhering to this Declaration aimed at maximising the accessibility of digital research data; and consider the possible implications for other countries, including developing countries and economies in transition, when dealing with issues of access to digital research data.

Source: www.oecd.org/document/15/0,2340,en_2649_33703_25998799_1_1_1_1,00.html.

GOVERNMENT STUDIES / PRESENTATIONS IN OECD WORKSHOPS AND CONFERENCES

Government presentations in OECD workshops and conferences. For all presentations at the OECD - MIT Digital Content Conference (January 2006) at which most OECD governments made presentations please consult:

http://www.oecd.org/sti/digitalcontent/conference.

United Kingdom: *The United Kingdom's (or DTI's) Engagement with the Content Sector*

John Kroeger, Head, Computer Games and Internet Commerce

Digital Content and Publishing Unit, Department of Trade and Industry, United Kingdom

http://www.oecd.org/dataoecd/57/48/32158544.pdf

Broadband Content Policy: The UK Approach

Mervyn Levin (Digital Content and Publishing Unit, Department of Trade and Industry)

http://www.oecd.org/dataoecd/18/11/34078718.pdf

Prime Minister's Strategy Unit (2005), *Connecting the UK: the Digital Strategy*, March 2005, joint report with the Department of Trade and Industry.

Japan: *Promotion Policy for Content Business in Japan*

Masamichi Kono, Counsellor, Secretariat of Intellectual Property Strategy Headquarters Cabinet Secretariat, Japan

http://www.oecd.org/dataoecd/57/47/32158552.pdf

Studies or links:

MPHPT (2003), *Information and Communications in Japan, Building a new, Japan-inspired IT Society*, Ministry of Public Management, Home Affairs, Posts and Telecommunications, available at www.johotsusintokei.soumu.go.jp/whitepaper/eng/WP2003/2003-index.html

IT Strategic Headquarters, www.kantei.go.jp/foreign/policy/it/index_e.html

Intellectual Priority Strategic Program 2005, www.kantei.go.jp/foreign/policy/titeki/kettei/050610_e.pdf

Norway: *Norway's Strategy for Electronic Content*

Eivind Lorentzen, Norwegian Ministry of Trade and Industry

http://www.oecd.org/dataoecd/57/46/32158568.pdf and http://www.oecd.org/dataoecd/17/49/34078064.pdf

United States: *Broadband in the United States: Regulator's View*

Irene Wu, Assistant Chief, Regional and Industry Analysis, US Federal Communications Commission

http://www.oecd.org/dataoecd/58/5/32158584.pdf

Siwek, S. E. (2004), *Copyright Industries in the US Industries*, *The 2004 Report*, prepared for the International Intellectual Property Alliance, Economists Incorporated.

Korea: *New Growth Engine Digital Contents Industry: Policies for Promotion of Digital Contents Industry*

Young-A Im, Knowledge & Information Industry Division

Ministry of Information and Communication, Korea

http://www.oecd.org/dataoecd/58/4/32158598.pdf

Korean Public Knowledge Contents

Ji-youn Son, Ministry of Information and Communication, Korea

http://www.oecd.org/dataoecd/18/30/34078464.pdf

Italy: *eContent Policies and Action Plans*

Daniela Battisti Coordinator, Research and Studies Unit, Minister for Innovation and Technologies, Italy

http://www.oecd.org/dataoecd/58/3/32158917.pdf

European Union: *EU E-content Programme*

Javier Hernandez-Ros and Anne Troye, Directive on PSI and High-Level Group on Digital Rights Management, European Commission

http://www.oecd.org/dataoecd/18/28/34078340.pdf and http://www.oecd.org/dataoecd/18/13/34078795.pdf

European Commission (2000), *Export potential and linguistic customization of digital products and services*, Study for the European Commission prepared by Electronic Publishing Services Ltd and Equipe Consortium Ltd, available at www.cordis.lu/econtent/studies/studies.htm (13 January 2004).

European Commission (2000), *Access to capital to the content industries in Europe*, Study for the European Commission prepared by VDI/VDE-IT, INBIS and Price Waterhouse Coopers, ftp://ftp.cordis.lu/pub/econtent/docs/access_final.pdf.

European Commission (2002), *Digital Content for Global Mobile Services*, Study for the European Commission prepared by Andersen Consulting, www.cordis.lu/econtent/studies/stud_mobile.htm.

European Commission (2002), *Regulating Audiovisual Content in the Digital Age*; Brussels: European Commission (DG for Education and Culture), www.europa.eu.int/comm/avpolicy/index_en.htm.

Valentini, E. (2003), "eContent - European Digital Content on Global Networks", lrc.csis.ul.ie/publications/presentations /2003/Conference/Presentations/1.

Australia: *Fostering the Digital Content Industries*

Anne-Marie Lansdown, Department of Communications, Information Technology and the Arts, Australia

http://www.oecd.org/dataoecd/18/8/34078645.pdf

Studies:

Australia's Strategic Framework for the Information Economy 2004–2006, *'Opportunities and Challenges for the Information Age'*, available at www2.dcita.gov.au/__data/assets/file/32042/New_SFIE_July_2004_final.pdf

Research and innovations systems in the production of digital content and applications, Report for the National Office for the Information Economy September, 2003 QUT CIRAC Cutler & Company, www2.dcita.gov.au/__data/assets/file/12342/Research_and_innovation_systems_in_production_of_digital_content.pdf

NOTES

1. Presentations by Australia and the United Kingdom. All presentations can be found at www.oecd.org/sti/digitalcontent.

2. Lorentzen, E., "Norway's strategy for electronic content", describes the virtuous circle of development of infrastructure, leading to increased supply of content and services, leading to improved skills, leading in turn to improved infrastructure.

3. Presentations by Australia and Korea.

4. "Digital Content", Accenture Digital Forum, http://digitalforum.accenture.com/DigitalForum/Global/ViewByTopic/DigitalContent/0209_Digital_Content_Solutions.

5. See www.pewinternet.org/PPF/r/113/report_display.asp or Fisher, W. (2004), *Promises to keep: Technology, Law and the Future of Entertainment*, Stanford University Press.

6. Balkin, Jack M. (2006), "Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society", New York University Law Review, http://ssrn.com/abstract=470842.

7 Foundation for Research, Science, and Technology (2003), *R&D Strategy for creative industries – a discussion paper,* Foundation for Research, Science, and Technology, www.frst.gov.nz accessed February 2004.

8. Forfás (2003), *A Strategy for the Digital Content Industry in Ireland*, Department of Enterprise, Trade and Employment, www.forfas.ie/publications/digicontent02/021105_digital_content_report_s.pdf.

9. 2003-2004 Work Programme, 2.3.2.7 Cross-media content for leisure and entertainment; and www.cordis.lu/ist/activities/activities.htm / www.cordis.lu/ist/workprogramme/en/2_3_2_7.htm. The EU research framework on "Cross-media content for leisure and entertainment" is designed to improve the digital content chain, covering creation, acquisition, management and production, through effective multimedia technologies enabling multi-channel, cross platform access to media entertainment and leisure content in film music, games, news.

10. Prime Minister's Strategy Unit, *Connecting the UK: the Digital Strategy*, March 2005. A joint report with the Department of Trade and Industry, www.strategy.gov.uk/work_areas/digital_strategy/index.asp

11. Canarie Inc, *Filling the pipe: Stimulating Canada's Broadband Content Industry through R&D*, Delvinia, May 2001.

12 See www2.dcita.gov.au/ie/environment/drivers/creative_industries.

13. Kangas, S. (2003), "Benchmarking Literature Review", MGAIN Deliverable D6.2.1 to the European Commission User-Friendly Information Society (IST) Accompanying Measures Project IST-2001-38846.

14. See www.cordis.lu/ist/so/mobile-wireless/home.html.

15. www.cordis.lu/ist/workprogramme/en/2_3_2_6.htm. To programm plans to foster the emergence of a rich landscape of innovative applications and services for the mobile user and worker and to support the use and development of new work methods and collaborative work environments. See also European Commission (2002), *Digital Content for Global Mobile Services*, Study for the European Commission prepared by Andersen Consulting, www.cordis.lu/econtent/studies/stud_mobile.htm.

16. See www.mobilmedia.de.

17. European Commission (2000), *Access to capital to the content industries in Europe*, Study for the European Commission prepared by VDI/VDE-IT, INBIS and Price Waterhouse Coopers, ftp://ftp.cordis.lu/pub/econtent/docs/access_final.pdf.

18 See www.oecd.org/dataoecd/53/19/36701575.pdf.

19. Forfás (2003), *A Strategy for the Digital Content Industry in Ireland*, Department of Enterprise, Trade and Employment, www.forfas.ie/publications/digicontent02/021105_digital_content_report_s.pdf.

20. *Ibid.*

21. An example is the conclusion of the UNESCO "Convention on the Protection and Promotion of the Diversity of Cultural Expressions", adopted in October 2005, http://unesdoc.unesco.org/images/0014/001429/142919e.pdf.

22 See www.oecd.org/dataoecd/56/24/32983964.pdf.

23. European Commission (2004), Benchmarking national and regional policies in support of the competitiveness of the ICT sector in the EU, Annex 1: Country Reports Prepared for European Commission, Directorate-General Enterprises by the Fraunhofer Institute Systems and Innovation Research, http://ec.europa.eu/enterprise/ict/policy/ict-policies/index.htm.

24. European Commission (2004), *Anticipating Content Technology Needs*, ACTeN, Final Report, www.acten.net/uploads/916/ACTeN_FINAL_REPORT.pdf.

25. See www.culture.gouv.fr/culture/actualites/conferen/donnedieu/observatoirenum_dis.html.

26. The first report was published in April 2005; a second release in the first half of 2006, see www.innovazione.gov.it/ita/normativa/pubblicazioni/econtent2005_es.pdf.

27. Minister for Innovation and Technology; Ministry of Communications; Ministry of Cultural Heritage; Ministry of Justice; Minister for European Affairs; Ministry for International Affairs. See www.innovazione.gov.it/ita/intervento/normativa/comitati/riunioni_commissione_cd/archivio.shtml and www.innovazione.gov.it/eng/intervento/allegati/rap_cont_dig.pdf

28. See Danish Ministry of Culture (2003), *Denmark in the Culture and Experience Economy - 5 new steps*, Copenhagen: Ministry of Culture, available at www.kum.dk/sw8166.asp (11 February 2004).

29. METI (2003), *Domestic and overseas-oriented expansion of activities in the Japanese service sector*; in: White Paper on International Trade; Chapter 3, Section 4 and European Commission (2000a), *Export potential and linguistic customization of digital products and services*, prepared by Electronic Publishing Services Ltd and Equipe Consortium Ltd, www.cordis.lu/econtent/studies/studies.htm.

30. Examples : In order to promote exports of its computer industry the UK's Department of Trade and Industry supports UK representation at E3. Also, Multimedia Victoria, a Australian State Government agency, is the main supporter of the Australian Game Developers Conference.

31. Austrade's Global IT Team actively assists mobile digital contents providers research export opportunities and identify potential trade partners, www.austrade.gov.au/IT/layout/0,,0_S4-1_wqcrz2o-2_-3_-4_-5_-6_-7_,00.html.

32. Geradin, D. (2004) "Access to Content by New Media Platforms: A Review of the Competition Law Problems", Paper prepared for the workshop on "Availability of Content for New Media", Brussels (8 July 2004).

33. The Strategy was developed collaboratively between the Australian Government, state and territory governments and local governments, and identifies priority sectors such as regional, rural, and remote areas; small and medium enterprises; communities; health; education; and research.

34. Report and Order and Notice of Proposed Rulemaking, 18 F.C.C.R 13, 620 (FCC 2003); "Prometheus Radio Project v. FCC", No 03-3388, et al., Slip Op. (3d Cir., 24 June 2004).

35. OECD (2004), *The Implications of Convergence for Regulation of Electronic Communications*, [DSTI/ICCP/TISP (2003)5/FINAL], www.oecd.org/dataoecd/56/24/32983964.pdf.

36. See www.premier-ministre.gouv.fr/acteurs/communiques_4/premier_ministre_decide_accelerer_54155.html.

37. For a review of work on online payment systems for electronic commerce including micropayment issues see DSTI/ICCP/IE(2004)18/FINAL, "Online payment systems for e-commerce", www.oecd.org/dataoecd/37/19/36736056.pdf.

38. See Broadband content & services: strategic issues, PwC study prepared for EU telecom ministers' Roundtable, 22 April 2004 seminal EPPA report on this matter, www.eppa.com/Publications/Interactive_Software.htm.

39. Relevant hearings in the United States at http://judiciary.senate.gov/hearing.cfm?id=1624.

40. See http://googleblog.blogspot.com/2005/11/preserving-public-domain-books.html.

41. *C.f.* explanatory notes on the DMCA under www.copyright.gov/legislation/dmca.pdf.

42. See, for example, the WIPO Information Meeting on Educational Content and Copyright in the Digital Age http://www.wipo.int/meetings/en/details.jsp?meeting_id=9462 and related project at the Digital Media Project of the Berkman Center for Internet & Society at Harvard University, http://cyber.law.harvard.edu/media/. See also the Open Educational Resources project at the OECD under www.oecd.org/edu/oer.

43. See for the study and the recommendation http://europa.eu.int/comm/internal_market/copyright/management/management_en.htm.

44. See http://judiciary.house.gov/Oversight.aspx?ID=104. Copyright license reform, Hearing before the Senate Judiciary, Committee Subcommittee on Intellectual Property on "Music Licensing Reform" Tuesday, 12 July 2005, http://judiciary.senate.gov/hearing.cfm?id=1566 and Statement of the Register of Copyrights, before the US Senate on 28 September 2005, http://judiciary.senate.gov/testimony.cfm?id=1624&wit_id=4682.

45. See www.innovazione.gov.it/ita/news/2005/cartellastampa/sanremo/index.shtml.

46 Beuc (The European's Consumers'Organisation) (2004), *Digital Rights Management*, BEUC/X/025/2004, www.beuc.org. While the Group reached a consensus on the three papers, the consumer's trust and confidence aspects could not be addressed comprehensively, and the consumer side did not support the papers on 'Legitimate Services' and 'Private copying'. In order to allow a larger number of stakeholders to express their views, it has been decided to launch a wider, informal consultation on the Final Report.

47. See the 3rd Digital Rights Management Conference in Berlin, January 2005, www.digital-rights-management.org/mcms.php?p=&i=&active=71&leftval=1&rightval=2&level=2.

48. "British Music Fans Experience Digital Frustrations", in digitalmusicnews.com (26 April 2005).

49. Also see the results of the INDICARE project at: www.ivir.nl/publications/helberger/INDICAREStateoftheArtReport.pdf. For an analysis of the impact of

Online Music Stores on user rights, see the Berkman Center's case study, "iTunes: How Copyright, Contract, and Technology Shape the Business of Digital Media".

50. Comments on the OECD Working Party on Information Economy Draft Report "Digital Broadband Content: Music", Berkman Center for Internet & Society, Harvard Law School (William W. Fisher, Urs Gasser, Derek Slater, Meg Smith, and John Palfrey), 10 January 2005.

51. See http://europa.eu.int/information_society/eeurope/2005/all_about/digital_rights_man/doc/040709_hlg_drm_2nd_meeting_final_report.pdf.

52. See www.indicare.org.

53. Examples cited are: disseminating information; economical modeling of rights payments under a range of possible licensing arrangements; contract arrangements for digital rights transfers; supporting technical standards for digital rights management; or promoting investment and participation in IT infrastructures for digital rights management.

54. http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-02-231A1.pdf. Subsequently the United States Circuit Court of Appeals has struck down this FCC rule requiring television and computer makers to include a technology known as the broadcast flag in all new digital televisions starting on 1 July 2005.

55. Privacy Online: OECD Guidance on Policy and Practice (2003), addressed to OECD member countries, business and industry, and individual users, focuses on the implementation of the 1980 *OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data* in the online environment.

56. See http://europa.eu.int/comm/avpolicy/regul/regul_en.htm#3 for the process.

57. See OECD (2001), Taxation and Electronic Commerce - Implementing the Ottawa Taxation Framework Conditions - 2001 Report and the implementation report at www.oecd.org/dataoecd/45/19/20499630.pdf.

58. Internet Tax Freedom Act (ITFA), Public Law No 105-277, Oct 1998. Sec 1101(a). The moratorium was extended in 2001 and expired on 1 Nov 2003. It is important to note that the US moratorium does not prohibit the imposition of sales taxes on e-commerce transactions.

59. Council Regulation (EC) No 792/2002 of 7 May 2002 amending temporarily Regulation (EEC) No 218/92 on administrative cooperation in the field of indirect taxation (VAT) as regards additional measures regarding electronic commerce, OJ L 128/1 (15 May 2002). The proposed directive requires that non-EU suppliers register with a VAT authority in an EU Member State.

60. Congressional Research Service (2003), pp 11-12 and 'European Union E-Commerce Proposal', Statement by Deputy Treasury Secretary Kenneth W. Dam, Office of Public Affairs of the US Treasury, PO-1001 (8 Feb 2002), Internet: www.ustreas.gov/press/releases/po1001.htm.

61. OECD (2006), Public Sector Information and Content, DSTI/ICCP/IE(2005)2/FINAL, http://www.oecd.org/dataoecd/10/22/36481524.pdf.

62. The aim is to publish all available, state guaranteed data and information which means revised data and information and described by metadata.

63. For further information see www.econtentplus.net.

64. See www.innovazione.gov.it/ita/normativa/pubblicazioni.shtml.

65. See http://europa.eu.int/information_society/activities/digital_libraries/index_en.htm.

66. The project addresses the need for a national framework to support the supply of high quality Australian content to broadband users. The framework will assist Australian cultural, educational and research

organisations to provide full-screen and full-motion video content to emerging broadband networks. A model for an Audiovisual Australia has been developed based on the successful Picture Australia service.

67. See www.manuscriptorium.com.

68. The public Internet-client was scheduled to open in September 2005 at www.kulturarv.dk/museernessamlinger. A pilot study for the project is available at www.kulturhistorieonline.dk/.

69. See www.bibliotekernesnetmusik.dk/.

70. See www.culture.gouv.fr/culture/actualites/communiq/donnedieu/appelprojet.html.

71. See www.nda.hu/engine.aspx?page=englishversion.

72. See www.nava.hu/english/start.html.

73. Some key initiatives include the Collections Australia Network, a joint initiative of the Australian, State and Territory Governments; the Australian Fauna Web site Ozcam; Digital Spotlights from the National Screen and Sound Collection, MusicAustralia and PictureAustralia; Digital access to collections of the National Archives of Australia; and Australia's digital Web archive, Pandora.

74. See www.digitalstrategy.govt.nz/templates/Page_121.aspx.

75. The evaluation Web is to be found at http://web26.e-gram.cz.

76. DSTI/ICCP/IE(2004)7 (OECD Work Programme on Broadband Content – internal document). See also OECD (1999), Defining the Content Sector: A Discussion Paper, OECD, Paris; Pattinson, B. (2003), *The Measurement of Creative Digital Content*, Department of Communications, Information Technology and The Arts, Canberra, Australia and Technopolis (2003), *Indicators for European Digital Content for the Global Networks*, April, Vienna.