JRC Scientific and Technical Reports

The Future Evolution of the Creative Content Industries

Three Discussion Papers

Fabienne Abadie, Ioannis Maghiros, and Corina Pascu
Editors

JRC
EUROPEAN COMMISSION

ipts
Institute for
Prospective
Technological Studies

ETEPS
NET
European Techno-Economic Policy Support Network

The mission of the IPTS is to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic and a scientific or technological dimension.

European Commission
Joint Research Centre
Institute for Prospective Technological Studies

Contact information
Address: Edificio Expo. c/ Inca Garcilaso, s/n. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

http://ipts.jrc.ec.europa.eu
http://www.jrc.ec.europa.eu

Legal Notice
Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server http://europa.eu/

Luxembourg: Office for Official Publications of the European Communities

PREFACE

This report is the compilation of three discussion papers prepared during the EPIS project – European Perspectives on the Information Society – with a view to gaining an in-depth understanding of the creative content sector. The creative content sector is characterized by a great diversity of activities, therefore music, books, games, films / TV broadcasting, cultural spaces, mobile content and advertising have been the focus of EPIS, for two main reasons: the role of ICT in their evolution and their contribution to the creation of growth and jobs in Europe. By studying the future evolution of the sector the ultimate goal of EPIS was to provide strategic intelligence for policy makers, and assess the need for policy action in order to unleash the potential of the creative content sector in Europe. The EPIS project was commissioned by EC DG INFSO and carried out by the ETEPS Network[1] in cooperation with IPTS between November 2006 and March 2008.

The three papers presented in this report address the following issues:
- **Discussion Paper 1** describes the state of the art of the creative content sector in Europe and establishes a present scenario, in market, industrial, technology and business terms, for a set of sub-sectors (books, music, audiovisual production, video games and cultural spaces) engaged in the mass production of creative goods.
- **Discussion Paper 2** analyses the impact of ICT innovations on the industrial structure and dominant business models of these sub-sectors.
- **Discussion Paper 3** focuses on factors related to consumer demand, and social and institutional issues that might drive or hinder the adoption of these innovations.

The three discussion papers were presented and validated at a workshop (May 2007) with stakeholders from different parts of the creative content sector. They were also used as a basis to define theses for a Delphi survey that was carried out in June-July 2007. Finally the discussion paper findings helped define scenarios for the future of the creative content. These scenarios may be the subject of a separate publication.

The papers present an in-depth analysis of the creative content sector and its future evolution. They can be read sequentially or individually according to the interest of the reader.

---

[1] The ETEPS AISBL – European techno-economic policy support network was set up on the initiative of the IPTS in 2005 by 19 effective members from 15 EU Member States. It further counts 19 associated members worldwide and is supported by a network of external organisations. Its main mission is to provide intellectual services for carrying out techno-economic and policy-related studies in the context of EU policy-making. See: www.eteps.net for further information.

TABLE OF CONTENTS

Discussion Paper 1:
State of the Art of the European Creative Content Industry and Market and National/Industrial Initiatives

EPIS Work Package 2 – Deliverable 2.1

**Administrative Arrangement
30-CE- 0070769/00-29**

IPTS – IS Unit

The following EPIS project partners and ETEPS* members are the authors of this report:

Juan Mateos-Garcia   SPRU - Science and Technology Policy Research   UK
Aldo Geuna   SPRU - Science and Technology Policy Research   UK
W. Edward Steinmueller   SPRU - Science and Technology Policy Research   UK

The following IPTS EPIS Team members have contributed to and edited this report:

Ioannis Maghiros   IPTS, Senior Scientific Officer
Fabienne Abadie   IPTS, Scientific Officer
Corina Pascu   IPTS, Scientific Officer

This is the first discussion paper of a series of three which describe the present status and future trends in the Creative Content sector with the aim to help identify appropriate strategies to enhance the growth of the sector in the future.

EXECUTIVE SUMMARY

Discussion Paper 1 begins by focussing on the specific characteristics of creative content that make its reproduction, transmission and access through an ever-increasing variety of devices possible and inexpensive. It begins with an analysis of ways in which ICT innovations challenge traditional value chain structures and business models in the creative content sector. This analysis of technology and its impacts on industrial structure is further developed in Discussion Paper 2. The content industries have, in the past, often been dominated by large right-holders and content aggregators, endowed with sufficient financial resources to fund the creation, mass promotion and physical distribution of content goods, and to face the uncertainty that characterises cultural and entertainment markets.

Areas where recent ICT innovation in the area of digitisation, online distribution and access has been particularly important are identified. A qualitative assessment of the impact that recent ICT innovative trends have had on the production and distribution modes of specific sub-sectors is then carried out. This reveals that **the upheaval of industrial structures has been particularly strong in the music and audiovisual sub-sectors**, where the adoption of new models for the online distribution of digital content (ranging from peer-to-peer technologies to Internet Protocol Television) have started emerging as part of an ongoing process that is altering their industrial structures and business models radically.

It is important to note that the **smaller scale of change that ICT innovation has so far brought to the book and cultural spaces sub-sectors** (mostly confined, at this point, to the areas of internal knowledge management processes and eCommerce) does not preclude their eventual transformation along similar paths in the future. We focus on this issue in Discussion Papers 2 and 3.

The relative youth of the **video game sub-sector** may have contributed to the lack of attention being paid to important processes of technological and business innovation taking place inside it, such as **the transformation of shrink-wrapped products into online services, and the emergence of communities of users who engage in promotion and productive activities in close contact with business firms.** These innovations are supporting explosive rates of growth and are spilling over into other creative content sub-sectors and, more broadly, the Information Society. These issues are identified and described in Discussion Paper 1 and are analysed in more detail in Discussion Paper 2.

Our analysis of the European context shows the presence of **a highly creative content sector responsible for the production of a broad range of high quality goods whose competitiveness, especially compared to global mass media conglomerates, is hampered by the difficulties they face in reaching sufficient scale and scope as a consequence of the linguistic and cultural fragmentation of the European market**. Smaller actors also find **important barriers in their access to markets as a consequence of distribution bottlenecks and the growing consolidation of the retail sector**. New models based on online distribution of content and creation of close links with communities of users and consumers constitute potential strategies that these small and medium-sized actors, which predominate in the European creative content sector, can adopt in order to access (or create) markets and audiences from which, until now, they have been mostly excluded.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The growing adoption of Information and Communication Technologies (ICTs) is having a momentous impact in all areas of the Economy, changing the way goods are produced, distributed and consumed. The Creative Content sector constitutes, as a consequence of the symbolic, highly digitisable nature of the goods it produces, a particularly suitable environment for their application, which has become increasingly pervasive throughout the last two decades, with radical consequences. In this series of Discussion Papers we analyse the impact of these innovative processes on the industrial structure and business models of the sector, focussing particularly on the Printing and Publishing (especially Books), Music, Audiovisual (Films and Television), Video Games and Cultural Spaces sub-sectors, but without losing sight of other creative areas where ICTs are being applied: an essential feature that characterises these technologies and networks is their broad applicability to any kind of digital good,[2] and many of the processes and dynamics we will be describing are relevant to sub-sectors outside the initial scope of our analysis.[3]

We begin, in Discussion Paper 1, by presenting state of the art in the Creative Content Sector in Europe. Discussion Paper 2 analyses the likely impacts of innovations in the area. Discussion Paper 3 examines the market, social and institutional barriers and drivers for the adoption of these innovations.

Discussion Paper 1 contains a characterisation of the sector and the sub-sectors we are focussing on in economic, business and technological terms within the European context. We identify loci where ICT innovation in content creation, distribution and sharing, and user interaction has had important repercussions in terms of industry structure and business models, major determinants of the sector's productivity and global competitiveness. Although the discussion will contain references to currently unfolding technological developments, this paper should be understood, in the context of the series, as a descriptive assessment of the special features of creative content goods that explain the industrial and commercial evolution of the sector, with an emphasis on traditionally dominant models and the contemporary European context. An essential premise that informs our analysis is that these traditional structures have been seriously challenged, in some cases already replaced as a consequence of ICT innovation. The assessment of the impact of technologies that have only been recently introduced in the market, or are currently under development will be the subject of Discussion Paper 2.

The technology-push focus of these two papers is complemented with the third one, where we assess the market, institutional and social drivers and barriers that favour or hinder the adoption of these innovations (and might thus speed or block the associated changes in structure and competitive dynamics).

The main goal of our analysis is to identify essential economic, competitive, technological and social forces that are currently shaping (and will shape, in the short and middle-term) the Creative Content Sector, and to illustrate the nature of their impact and their inter-linkages with scenarios that should inform subsequent quantitative research (e.g. through the

---

[2] For a thorough discussion of the economic implications of digital goods see Quah, D. (2003). Digital Goods and the New Economy. New Economy Handbook. D. Jones. San Diego CA, Academic Press**:** 289-321. Working paper version available at http://econ.lse.ac.uk/staff/dquah/dp-0212hbne.html (Accessed 1 March 2007)

[3] We will highlight particularly interesting cases as part of our discussion.

construction of statements to be tested empirically in a Delphi Survey) and provide policy-makers with a coherent and comprehensive picture of the sector's current state and future evolution.

This first Discussion Paper has the following structure:

Section 1 is an introduction.

In **Section 2** we provide a definition of the Creative Content Sector, and establish the criteria we have adopted for the selection of the sub-sectors in which we will be primarily focussing. We then describe the sector's key economic features, taking into account the technological state of the art. We adopt a broad perspective first, discussing features that are relevant to all the selected sub-sectors, and afterwards focus on individual sub-sectors. This analytical process enables the characterisation of prevailing industrial structures and business models, and the identification of areas and the nature of the impact of ICT innovation in content creation and distribution and user interaction (in which we focus in discussion paper 2).

In **Section 3** we describe the current situation of the European Creative Content Sub-Sectors in a global context, in quantitative and qualitative terms, considering national and industrial initiatives. We use data obtained from a diversity of sources, as well as the outputs of our own intelligence-gathering efforts in order to characterise each of the sub-sectors' competitive position, state of the art in technology adoption, industrial structure and dominant business models, as well as its strengths and weaknesses.

In the **Conclusions** we provide an outlook of the current competitive and technological position of the European Creative Content Sector within a global context. This "present scenario" constitutes the starting point of Discussion Paper 2, where we identify key ICT innovative trends in content creation and distribution and user interaction, and illustrate the nature of their impact on the European Creative Content industries as characterised in this conclusion.

2. THE STATE OF THE ART OF THE CREATIVE CONTENT SECTOR IN EUROPE

2.1 Our definition of the creative content sector

As Carmen Marcus, a researcher for the European Commission's DG RTD, shows in her appraisal of the future of the European Creative Industries, there are numerous definitions of the Creative Content sector, each of which comprises a wide range of heterogeneous activities with diverse levels of industrialisation and commoditisation (ranging from, for example, sculpture to advertising), and radically dissimilar value chains.[4] Because of this diversity, it is not possible to propose a general framework capable of capturing, in a meaningful way, the nuances and idiosyncrasies of this rich variety of activities, and this has made it necessary to select a sub-set of them that appear to be particularly important considering the background of the EPIS06 project, with its focus on the impact of ICTs on the production and distribution of creative content goods. In order to do this we have elaborated a Creative Content definition and established two criteria for the selection of the specific sub-sectors which we analyse in the following section.

- **Definition:** We define the Creative Content Sector as the collection of activities involving the *"creation and distribution of goods with an intrinsic cultural, aesthetic or entertainment value which appears linked to their novelty and/or uniqueness"*. This definition (which, it should be noted, does not specify the direction of the linkage between "novelty" and "value") makes it possible to adopt a tolerant characterisation of our subject matter avoiding traditional differentiations between "high" and "low" cultural activities, or the use of attributes that are restrictive such as "intellectual property" to identify them.[5] It also establishes a clear separation between creative content and communication media industries such as magazines, television or news broadcasting (where the value of the content is closely linked to its accuracy and timeliness).[6]

  Our definition excludes activities where, although creativity is undoubtedly present, the final output is valued by consumers in terms of usefulness or subsistence: in these areas the exercise of creativity tends to focus on improvements of efficiency or quality, and when new goods are created, these are valued according to the aforementioned criteria. A way to think about this difference is to compare a gardener with a farmer: although the latter individual might be creative in the techniques he adopts to carry out her productive work, we would not consider the crops she reaps as cultural.

- **Consumption goods:** There are many instances of "hybrid goods" (such as fashion products), that are valued in both tangible (usefulness/subsistence) and intangible

---

[4] Marcus, C. 2005: "Future of Creative Industries: Implications for Research Policy". Brussels: European Commission.

[5] Differently from the definition in Throsby, D 2001: "Economics and Culture". Cambridge: Cambridge University Press.

[6] Nevertheless, any of the issues we will be touching upon, such as the impact of new printing technologies, reproduction of digital content on portable devices and mobile phones, or shifts in the area of advertising are also relevant in some of these areas.

(aesthetics, culture or entertainment) terms. These intangible elements of utility/value are usually linked to these goods' "design" or "presentation", which are the outcome of creative activities that have become increasingly important as strategies for product differentiation and branding. Professionally valuable and educational cultural goods such as academic journals, trade magazines or textbooks would also constitute examples of such 'hybrid goods'. In our analysis we focus on the process of generating novelty or entertainment content and the use of various business models to exploit these values which generally involve 'final demand' (the demand of consumers) rather than 'intermediate demand' (the demand of individuals or organisations for inputs to be used in some productive process). This leads to the exclusion of creative activities such as design (aimed at enhancement the attractiveness of goods which are used for other purposes).

- **Mass:** A second criterion we have adopted in order to circumscribe our subjects of analysis is that of "mass": we focus on creative content activities where "mass production" (through replication of an original creative content good) is feasible (although not necessarily undertaken). A reason for the adoption of this criterion is our interest on the impact of processes of reproduction or replication, including the specific role of ICT innovation in content creation, distribution and user interaction, where effects on growth and employment are more profound. Mass industries (where content can be digitised) may draw upon those based on highly idiosyncratic production practices, or with a high presence value (e.g. theatrical performances and visual arts).

The adoption of the aforementioned definition and selection criteria has led to the inclusion of the following sub-sectors of the Creative Content sector in our analysis:

- **Audiovisual production** (film and television broadcasting, excluding advertising),
- **Music Recording and Publishing,**
- **Printing and Publishing** (focusing on Books),
- **Video game development and publishing,**
- **Cultural spaces** (museums and libraries).

In the case of the first four sub-sectors there is a creative effort aimed at the production of the master copy of a good which is relatively easy to duplicate and distribute digitally (digitise), and as such they follow a publishing/broadcasting model, which we describe in detail in the following section.[7]

In the case of the fifth sub-sector, we conceive museums and libraries as aggregations of cultural goods that can be digitised and distributed electronically following a model that is, in principle, analogous to the one presented above, although endowed with special characteristics derived from their "public" not-for-profit nature.

It is important to point out that Mobile phones and radio are not included in the list above because, throughout our Discussion Papers we shall focus on them as channels for the distribution of creative content goods, in most cases the output of other sub-sectors (e.g. mobile gaming or radio broadcasting of music content), rather than as the

---

[7]   As we will show in Discussion Paper 2, numerous ICT innovations, especially in the area of "user interaction", challenge the traditional top-down nature of these models.

locus of creative activities themselves.[8] As such, ICT innovations that affect them will be considered inside the 'content distribution' sub-sections for all the sub-sectors where they are relevant.

This selection excludes, in principle, a number of sub-sectors such as newspapers and magazines, advertising, fashion or design, whose production incorporates undeniable exercises of creativity. In the case of newspapers and magazines, this decision is justified by their nature as 'communication media', associated to markets presenting different dynamics, goals (precision and timeliness) and business models from creative content printed goods. Nevertheless, many of the impacts of ICT innovation in content creation (for example in the areas of digital printing and electronic document management), distribution and user interaction (online newspapers and self-publishing models) are applicable to these sub-sectors as well, and will be highlighted when relevant.

The reason for the exclusion of the advertising sub-sector from our analysis has to do with its market target: differently from the other creative content goods in which we are focussing as part of our Discussion Papers, demand for advertising comes not from mass consumer markets, but from companies that want to promote their products and services. In this sense, advertising cannot be understood as a 'consumption good' but as an investment made by those companies who engage in it.[9] Our decision to focus on consumption goods justifies, therefore, the exclusion of this sector. Nevertheless, advertising constitutes an essential tool for the promotion and diffusion of creative content goods and in the case of some sub-sectors, also an essential source of revenues, and as such it will be featured throughout our discussion papers, with a particular emphasis on the innovative forms it has adopted, and the business models it supports in the online context.

In the area of fashion, although the economic and social importance of this sub-sector is indubitable, the current inability to digitise the goods it produces justifies its exclusion from our analysis.[10]

Finally, the caveats to the inclusion of advertising and fashion are applicable to design activities as well.[11]

We also acknowledge that with its focus on mass processes of creative content production (and collection) our selection excludes from our Discussion Papers highly significant creative activities inside the realms of 'visual' and 'performance' artists. We will redress this issue, to an extent, by highlighting, in Discussion Paper 2, some

---

[8] The majority of the content created exclusively for radio diffusion can be considered as media, instead of creative content, while in the case of mobile phones, mobile content (e.g. ringtones, screen-savers etc.) is in most cases adopted from other creative sources.

[9] The product unit in the case of advertising is the 'campaign' or project elaborated as a commission from a contractor, which is then distributed with the goal of maximum/visibility impact, making many of the crucial issues relevant in the case of the other creative content goods in which we are focussing (such as control or pricing) irrelevant. Our treatment of advertising should not be taken to be the view that consumers fail to value, and thus demand, advertising, but that the way that demand is expressed most directly is through advertisers – in this respect, surgical patients demand scalpels but generally prefer not to consider their selection.

[10] An exception to this would be the virtual garments which are sold in Virtual Worlds such as Second Life.

[11] Design is, again, an investment, in many cases undertaken in-house (hence, difficult to characterise in terms of business models or industrial structures), and the market for its digitised version (i.e. blueprints and templates) is usually relatively specialised (i.e. not a mass market).

of the impacts that innovative ICT applications such as virtual worlds or collaborative models for content creation in these areas.[12]

To conclude this section, we recognise that our selection of creative content goods is incomplete, it is nevertheless coherent, and sufficient, for the purposes of our Discussion Papers: it makes it possible to identify the essential dynamics of creative content markets without introducing heterogeneous factors such as those characterising media goods, with a focus on mass markets of digitisable goods where the impact of ICT innovation in terms of competitiveness, employment and growth will be stronger. The adoption of a conceptual framework based on content creation, content distribution and user interaction activities justifies the inclusion of communication media such as mobile or radio as channels for distribution of content instead of as creative content sub-sectors in themselves and enables the incorporation in our analysis of those innovative trends in ICTs that are altering their nature, and affecting the industrial structure and business models of those creative content goods for which they are channels. This framework also facilitates the discussion, when pertinent, of the impact of ICT innovations with a wide deployment potential in sub-sectors outside those we have initially included: as we demonstrate throughout all three Discussion Papers, an essential aspect of ICT innovation is the homogenising effect it has on the traditionally idiosyncratic industrial structures and business models of different creative content sub-sectors- books, music, audiovisual content and video games tend to converge digitally, and to the extent that other creative content goods do as well, the conclusions of our analysis will be applicable to them too.

2.2 Economic and business aspects of the creative content sector

In this section we identify some key economic aspects of the Creative Content Sector using tools borrowed from the Economics of Information, Networked Markets and Cultural industries.[13] The features in which we focus (linked to the nature of the goods being produced) are basic determinants of the institutional and industrial structure and dynamics of the sector, and of the dominant business models that have characterised it until recently.

Understanding these factors makes it possible to identify specific loci where ICT innovation has started altering cost structures, creating new distribution channels or facilitating cooperation between actors, with the ensuing disruption of traditionally dominant models, processes of disintermediation or realignment of value networks, and the emergence of new opportunities and markets for innovative players.

We carry out our analysis in three sub-sections: in 2.2.1 and 2.2.2 we respectively identify essential features of the Creative Content sector which cut across all the sub-sectors we are considering, and present its basic business model. Our discussion takes

---

[12] Thus acknowledging the broader definition of cultural and creative sector proposed in KEA 2006: "The economy of culture in Europe". Report available at: http://ec.europa.eu/culture/eac/sources_info/studies/economy_en.html

[13] Caves, R. 2002: "Creative industries: contracts between art and commerce". Cambridge, Mass.: Harvard University Press, Shapiro, C. and Varian, H. 1998: "Information rules: a strategic guide to the network economy". Boston, Mass.: Harvard Business School Press, Baumol, William J, 1982. "Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, American Economic Association, vol. 72(1), pages 1-15, March. Machlup, F. 1980, "Knowledge: Its Creation, Distribution and Economic Significance, Volume 1: Knowledge and Knowledge Production", Princeton, NJ: Princeton University Press.

place in relatively general terms, although it includes several examples in order to illustrate the processes being described: we identify features through a descriptive narrative, highlighting their interactions with ICT innovations, that are specified in further detail in sub-section 2.2.3 where we focus on specific factors linked to the particular economic and technological characteristics of each of the sub-sectors.

2.2.1. Key characteristics of the creative content sector

In this sub-section we present some essential economic features that characterise Creative Content goods, and analyse their impact on the sector's industrial structure taking into account their relationship with technological innovation (see Figure 2 at the end of sub-section 2.2.2 for a summary of the effect that these features have in the structure of the sector, and the relevant technologies inside of each area):

a) The creative content value chain

The creative content sector value chain has the following steps (see Figure 1):[14]

- **Content creation**- Includes the artistic and technical activities that result in the production of creative content.

- **Content publication-** Includes the aggregation, presentation, pricing and marketing of a creative content good.

- **Content distribution-** Includes the content transportation, logistics, intermediation and stock management activities to which a creative content good is subject until it reaches its point of sale.

- **Content retail-** Includes the retail pricing, presentation and transaction management activities to which a creative content good is subject until it is sold to a customer.

- **Intermediate inputs to all the steps above-** Includes the design, development, production and supply of all the intermediate outputs necessary for the undertaking of the aforementioned activities (e.g. software, hardware and specialised services and network access which enable content creation, publication, distribution and retail).

This stylised model of the Creative Content Sector value chain, illustrated in Figure 1, makes it possible to understand the basic division of labour inside the sector. It should be noted that there is no fixed correspondence between steps in the value chain and the actors that are involved. For example, vertical integration might lead to the incorporation of different activities by a single actor (e.g. an artist who sells her work in a personal website, thus assuming creative, publication and distribution functions). Different sectors present specificities in their industrial structures and these might diverge from this basic model depending on the nature of the creative content good

---

[14] Porter, M. 1985: "Competitive Advantage: Creating and Sustaining Superior Performance". New York: Free Press. We acknowledge that the Value Chain's implicit depiction of top-down flows of information and goods, and its emphasis on intermediation and disintermediation limits its usefulness as a tool for the analysis of the dynamics of Creative Content industries in a context of growing interactivity and flexibility. However, we consider its introduction necessary in order to map the structure of the division of labour inside the sector. In Discussion paper 2, when focussing on emerging innovative trends in ICT and its impact, we move towards a more flexible 'value network' approach along the lines of EC 2003: "The EU Publishing industry: An assessment of competitiveness". Luxembourg: Office for Official Publications of the European Communities.

being produced and the technological infrastructure required for content distribution and consumption.

Figure 1: The basic value chain of creative content markets
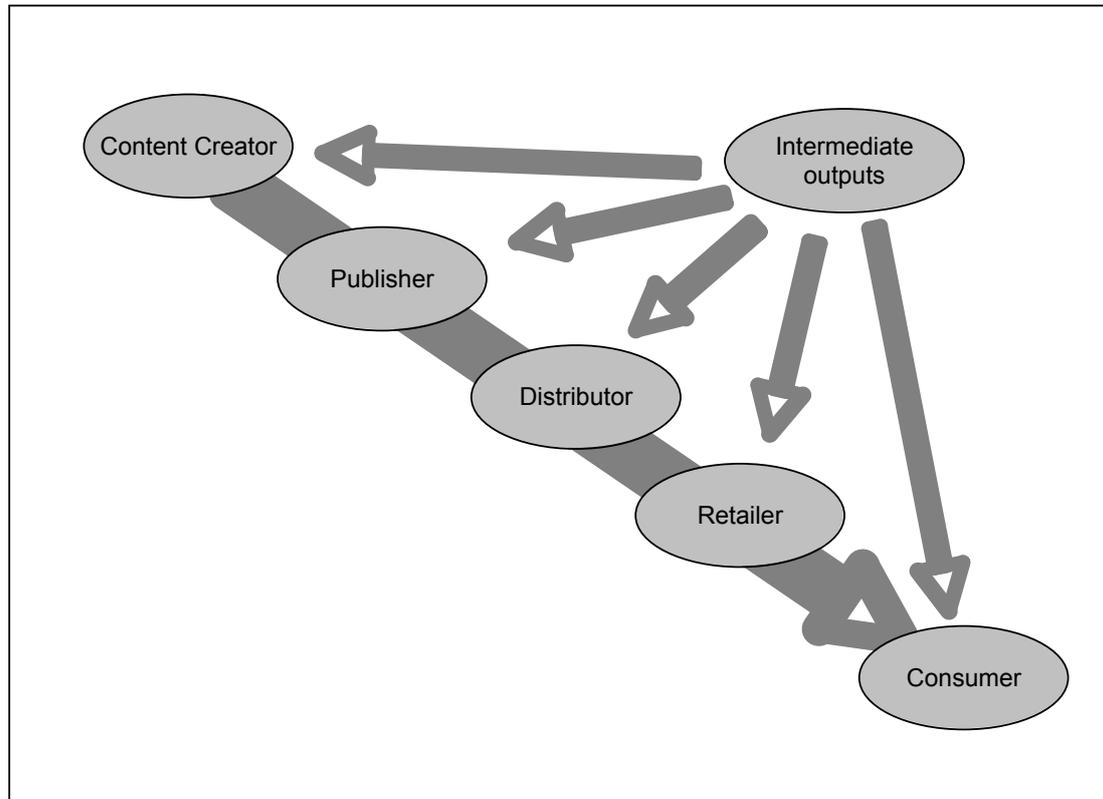
b) Creative content as an information good and the financial role of publishers

Creative Content is an information good, and as such its production presents a cost structure characterised by high fixed and low marginal costs:[15] the investment necessary for the production of the first ("master") copy of a creative content good is high, but once this task is accomplished, producing additional copies is relatively inexpensive.[16] For example, once a piece of music has been recorded, the costs of producing extra copies (i.e. pressing Compact Discs) are very low.[17] This characteristic has important implications for industrial structure and the predominant business models within the sector, as it creates the need for a relatively high investment at an early stage of the creative process, which leads to the emergence of publishers, who specialise in the funding of creative content production and distribution.[18]

---

[15] Caves (op. cit. p. 11)

[16] This is a consequence of the symbolic nature of information goods, and of the advances in content reproduction technologies, in which we focus below in this same sub-section.

[17] Peitz, M. and Waelbroeck, M. 2004: "An Economist's Guide to Digital Music". CESIFO Working Paper No. 1333.

[18] The presence of this phenomenon in the area of distribution (i.e. once a distribution channel is set-up, the additional cost of distributing additional copies of a good is relatively low) leads to processes of consolidation in this area, and raise barriers to entry.

c) Creative content as an information good, the function of intellectual property rights and digitisation

The low marginal cost of producing additional copies of a Creative Content good (this is, its high reproducibility) brings forward the need to establish and enforce Intellectual Property Rights regimes (i.e. copyright and trademarks) in order to provide incentives for creative actors to engage in innovative activities. In their absence, it is argued that they would lack sufficient incentives to engage in creative content production in the first place.

Digitisation makes it possible to reproduce and transmit many types of creative content at almost zero cost using telecommunication networks and emerging technologies such as peer-to-peer networks. According to large associations of mainstream publishers, the usage of these channels for content distribution has aggravated the problem of piracy threatening the survival of some sub-sectors.[19] "Digital Right Management" (DRM) measures are being growingly implemented in digital content media with the aim of hindering the illicit reproduction and distribution of content.[20]

Digitisation is also linked to unfolding processes of technological convergence, as creative content becomes easier to reproduce in a diversity of media. An example of this would be text, which once digitised can be accessed through computers, portable devices, mobile phones or digital television.[21] This has technological implications for creative content production (e.g. implementation of processes and tools that facilitate the production of cross-platform content) and, is constrained by the presence of technological standards for content transmission and reproduction.

d) Creative content and mass markets

The low marginal costs of Creative Content production (in a context of stable revenue per unit of good sold) creates incentives for profit maximising actors to try and reach as large a market possible by publishing content goods with a broad appeal. This goal might conflict with the artistic and innovative aspirations of content creators, and have a detrimental effect on the diversity of creative content goods available in the market.

e) Cultural markets

According to Caves, cultural goods present the following characteristics:[22]
- Uncertain demand,
- Short period of profitability,
- Infinite variety,
- Vertical differentiation of markets.

These features are linked to the high reproducibility and potentially high profits of "blockbusters." A high quantity and diversity of supply is produced as suppliers

---

[19] Leibowitz, S. 2005: "Pitfalls in Measuring the Impact of File -sharing on the Sound Recording Market". CESifo Economic Studies, Vol. 51, 2-3/2005, 439–477

[20] EC 2002a: "Commission Staff Working Paper- Digital Rights Management: Background, Systems, Assessment". Brussels: European Commission.

[21] i2010 High Level Working Group 2006: "The Challenges of Convergence". DG INFSO Working Paper.

[22] Caves (op. cit. p. 11)

attempt to win the sweepstakes represented by the existence of "blockbusters"). The uncertain relationship between content's characteristics and its value (demand for a specific Creative Content good is very difficult to predict a priori) sustains variety. Vertical differentiation (i.e. fragmentation of the sector in mass and niche markets) appears as a consequence of heterogeneity in the motivations of content creators and publishers (profit-maximising actors who target mass markets and specialised suppliers who focus on niche markets) and an heterogeneous demand: it has been observed that actors with different sizes, goals and cultures act in complementary ways (smaller independents discover and develop talent which is then launched into mass markets by larger companies, such was the case with Oasis, the UK Britpop band initially discovered by independent record label Creation).[23]

The combination of diversity in supply and uncertain demand further increases the risks of creative content good creation and publication. Publishers (especially those aiming for mass market success) try to address this issue through marketing and branding strategies aimed at increasing product visibility.[24] This also results in further enlargements in the financial investment required to produce and publish a Creative Content good, and drives sector consolidation. It is also argued that the growing financial investments necessary to guarantee customer awareness of a creative content good make large publishers risk-averse and conservative in their release strategies.

The high quantity and diversity of supply, especially in a digital context, also strengthens the importance of content tagging and filtering innovations including Folksonomies and search engines that provide consumers with content identification, location and access services.

f) Channel diversification, convergence and leveraging of content in different media

The Intellectual Property embodied in Creative Content can, in some cases, be distributed into several markets simultaneously (e.g. motion pictures adapted into books and video games, with an original soundtrack and assorted toy lines and merchandise).

Channel diversification and digital convergence create important economies of scope in the sector and favour horizontal integration. An outcome of this process is the emergence of large media conglomerate such as Virgin or News Corp. with the size and capabilities necessary to leverage resources that are, in principle, targeted at different markets, finally incorporating, in some cases distribution, media and retail channels.[25]

g) Social consumption of creative content goods

The symbolic, cultural and interpretative nature of Creative Content goods lends an important social dimension to their consumption, associated with network effects and virtuous market circles where, for example, "success begets success" (e.g. fan

[23] Marcus (op. cit. p. 9), Gander, J. and Rieple, A. 2004: "How Relevant is Transaction Cost Economics to inter-Firm Relationships in the Music Industry?". Journal of Cultural Economics 28, pp 57-59.

[24] An example of this would be the casting of renowned "stars" in the case of films.

[25] Chan-Olmsted, S. and Chang, B. 2003: "Diversification Strategy of Global Media Conglomerates: Examining its Patterns and Determinants". Journal of Media Economics 16 (4), pp. 213-233.

communities who carry out informal "word-of-mouth" marketing activities which can be much more effective and successful than traditional marketing.[26] The perception of these social dynamics has brought forward the implementation, in the digital context, of virtual community strategies aimed at creating expectation ("hype") about future releases, enhancing customer brand loyalty, selling complementary goods (e.g. merchandise) and obtaining feedback.

h) Technological platforms, standards and creative content goods

Classification, software and hardware standards facilitate seamless inter-communication between networks, media and devices and the digital transmission and reproduction of creative content goods. The presence of standards reduces consumer uncertainty and promotes the uptake of technologies for digital content reproduction and distribution (e.g. inter-operability problems related to the lack of a dominant standard has hindered the adoption of eBooks and DRM Technologies).[27]

Standard setting processes require co-ordination between actors across different sectors, and can be carried out through negotiation (de jure standards) or market (de facto standards) processes where creative content goods become components or complementary assets that enhance the attractiveness of competing technological platforms.[28] The outcome of these processes, and the balance of power between the providers of the components that constitute them are important determinants of the industrial structure and dominant business models within individual creative content sub-sectors. For example, the video game console market is dominated by three large hardware providers (Sony, Nintendo and Microsoft) who restrict video game developer access to their proprietary platforms; their position as gatekeepers gives them a central position in the sub-sector and increases their bargaining power making it possible for them to establish favourable conditions of exchange with their suppliers and distributors. The strategic decisions that creative content publishers need to make regarding, for example, which standard to support appear linked to the channel diversification and digital convergence issues mentioned above.

2.2.2. The creative content business model

Having presented some essential characteristics of creative content goods, discussed their economic implications in terms of content creation, distribution and, to an extent, user interaction, we briefly describe now the defining features of the sector's business model, sketching the nature of the impacts that content digitisation and other innovative trends have had in it. The reader should bear in mind that the discussion in this sub-section has as its main goal to illustrate some basic features of the business model that dominates the creative content sector, to be specified in further detail in our discussion of each of the sub-sectors which follow in 2.2.3.

---

[26] Nielsen Buzzmetrics 2006; "Consumer Generated Media 101: Word-of-Mouth in the Age of the Web-Fortified Consumer". New York: Nielsen Buzzmetrics.

[27] TENIA Consortium 2002: "The emergence of New Industrial Activities: Fusing Services and Manufacture (Conceptual Framework)".

[28] Shapiro and Varian (op. cit. P. 11), Evans, D., Hagiu, A. and Schmalensee, R. 2005: "A Survey of the Economic Role of Software Platforms in Computer-based Industries". CESifo Economic Studies, Vol. 51, 2-3/2005.

a) Publishers and content creators

Publishers and content creators need to finance the initial content creation and marketing, a requirement that places publishers in a central position in the industry. Processes of consolidation in the sector have reduced the number of entry points into the market for content creators (e.g. independent authors, video game development and film studios etc.) creating a classic oligopsonic (demand oligopoly) situation. The dominant business model is based on publishers' advancement of funding to content creators in exchange for the property rights over content (including, in some cases, future works). Once the advance is recouped from sales of the product, content creators start receiving royalties, usually a share of the revenue per unit of content sold.

b) Publishers and distributors

The nature of the interaction between publishers and distributors depends on the physical nature of the good being produced, and we focus in it in more detail when describing different sub-sectors. Generally, it can be said that the growing trend towards content digitisation and online distribution tends to reduce the importance and power of distributors and wholesalers, which are in some cases being vertically integrated by publishers.

c) New players in the area of online distribution

Although the move towards digital distribution has not lessened the role of publishers, who carry out essential funding and marketing functions (essential to increase a product's visibility in a fiercely competitive environment), it creates new opportunities for actors with key capabilities and resources for online content aggregation, distribution and branding, such as Internet Service Providers and Internet Portals. In some cases online distribution chains have been 'captured' by players who have been able to leverage their power in one step in order to attain dominance over the rest. Such would be the case with Apple, who has used its dominance over the mp3 player market in order to expand its activities into the distribution of digital music (and increasingly, other types of digital content), excluding competitors from access through the implementation of proprietary DRM formats that are only compatible with Apple's devices.

d) Retail

Physical retailers still maintain an important function in the distribution and promotion of creative content goods (e.g. by placing them in visible displays in their stores). Consolidation of particular 'retail' outlets areas (e.g. video game stores and rental outlets) has increased their bargaining power and made publishers reluctant to, for example, undercut them through online distribution of goods at prices which reflect the more cost-efficient nature of these channels.[29]

---

[29] The common use of a data CD that is difficult to reproduce and serves as a 'key' to prevent copying is another reason for continued physical distribution although online authentication of products is becoming more commonplace.

e) Providers of intermediate inputs and tools

The growing complexity and costs of content creation brought forward by market and technological processes, and the fierce competition in creative content markets has increased content creators' reliance on developers of creative and project management tools with the aim of containing rising project costs and fulfil schedules. As it is the case with other software products, access to these tools takes place in terms of user licensing, with contractual forms in some cases established using innovative revenue-sharing models (e.g. tool providers who obtain royalties from the sales of the final output of a project).

f) Communities of customers

The move towards online distribution models facilitates the creation of closer communication channels between content owners and consumers, as well as the emergence of communities of the latter that in some cases engage in content production themselves. This is an area undergoing an important degree of experimentation in terms of innovative business models and IPR arrangements. The dominant trend is based on the exchange of user-generated content for merchandise and non-monetary rewards such as prestige and visibility inside the consumer community, although other alternatives, such as the creation of markets for the exchange of such complementary assets have started emerging. We discuss them when focussing in those sub-sectors (such as video games) where they have been implemented more successfully.

Figure 2: Creative content goods, impact on industrial structure and key technologies
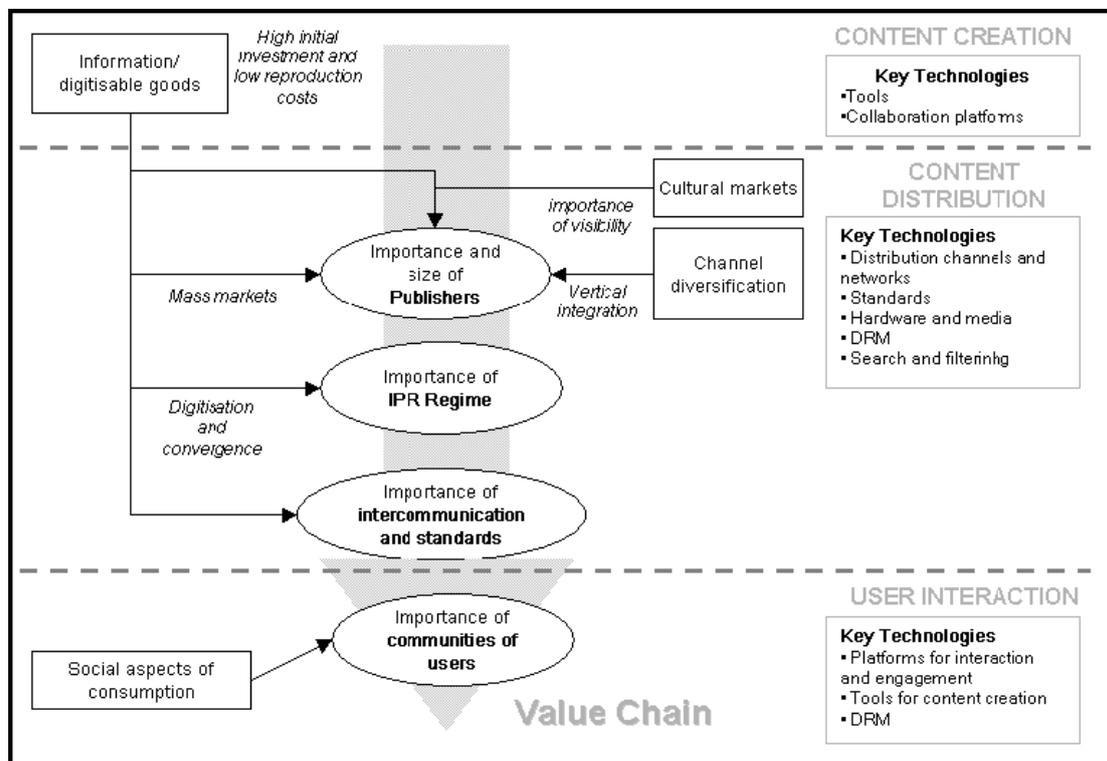
2.2.3. Economic, business and technological issues of creative content sub-sectors

Having identified, in the previous sub-section, some of the defining features of Creative Content goods and their repercussions on industrial structure and dynamics, as well as the associated business model, taking into account recent technological trends in the area of content digitisation, reproduction, transmission and access, we focus now on specific features of each of the sub-sectors in which we are concentrating throughout our report. Our goal is to provide a coherent picture of the characteristics of the industrial structure, and the current technological state of the art of each of the sub-sectors (within which we discuss the particulars of the European situation in Section 3).

The discussion of the impact of ICT innovation on industrial structure and business models carried out in this section has the aim of providing a dynamic context for the analysis of the competitive situation of the European sub-sectors in the following section, mostly descriptive, is illustrated through Innovative Leader Overviews, which briefly present cases of innovative business models associated to ICT technologies which have gained a position of dominance in specific sub-sectors. Discussion Paper 1 takes the analyses carried out in this sub-section as a starting point for the elaboration of foresight exercises (mini-scenarios) assessing the impact of promising technologies with a small market presence, or currently under development.

a) The book sub-sector

We focus on the book sector as a sub-sector of what, in the context of European policy is defined as the 'Printing and Publishing industries', which also includes newspapers, magazines and academic and trade journals.[30] Our focus on books is justified by their 'creative content good' aspect when compared to newspapers and magazines (with a mass media function) or academic journals (that fulfil a role for the dissemination of research results in academic communities). It should not be forgotten, however, that the book category also includes journalistic accounts, biographies, works of scientific exposition, collections of articles, textbooks and other forms of content which could be construed as outside of the creative content area.[31] Books are defined, according to UNESCO, as "Non-periodical printed publication of at least 49 pages excluding covers".[32]

Of all the sub-sectors included in our discussion paper, the Book sector is, at least in its current form (characterised by the prevalence of the book as a "physical object") the one that resembles more closely our general characterisation of the Creative Content sector as presented in the previous sub-sections.

---

[30] We exclude audio-books from our analysis, given their special features as 'book content' reproduced in audio formats. We go back to them, in the context of ICT impact on the distribution of music goods in Discussion Paper 2.

[31] In this section we are focussing, using the industry's terminology, on 'trade publishing' (EC 2004a: "Publishing Market Watch Final Report". Brussels: European Commission.). The main feature that differentiates book publishing from newspapers and magazines is the stronger reliance of the latter on advertising as a source of revenue. Advertising supported business models for content creation are addressed when we discuss the creation of audiovisual content (Television and motion pictures), and the implications of ICT innovation in the area are relevant for this area of publishing as well.

[32] Vaknin, S. 2005: "The Future of Electronic Publishing". Article available at http://samvak.tripod.com/busiweb24.html

There is an abundant supply of manuscripts which are selected, edited and marketed by publishers of diverse sizes and market focus. There has, however, been a trend towards consolidation with the emergence of large media conglomerates with economies of scale in portfolio diversification, promotion of titles, distribution and negotiation with retailers.[33]

Economies of scale in printing and uncertainty about demand create risks which are addressed via stock management and return (and pulping) of unsold titles, an area where distributors play an important role.[34] Some of them also carry out financing functions (e.g. providing advance payments to smaller publishers or collecting cash sales from retailers[35]).

The area of retail also presents economies of scope and scale, as availability of financial resources and shelf-space makes it possible for larger bookshops to diminish risks in the selection of stock and engage in advantageous negotiations with distributors. This has led to a process of consolidation, limited to the extent to which retail competition is attenuated by public policies such as price intervention, justified by the cultural value of books.[36] Internationally, there are other models for such interventions such as in Japan where collaboration between publishers, distributors and retailers lessen the severity of these competitive dynamics.[37]

ICT innovation has had an important impact in the sector in a number of areas:

▪ **Content creation**

- Digital content and electronic document management, print-on-demand and digital printing have increased the efficiency and flexibility of book production processes, reducing the fixed costs and risks of publishing and facilitating the entrance of new players in the sub-sector. Reductions in the costs incurred by printing an edition of a book make it possible to carry out small, exploratory runs that can be increased if there is a positive market response.[38]

▪ **Content distribution**

- The implementation of automated systems for stock chain and return management, facilitated by book classification according to international standards (International Standard Book Number or ISBN, and Global Trade Identification Number) have reduced the costs of distribution and started to replace what in some cases used to be personal interactions between booksellers, distributors and

[33] Hyatt, S. 2002: "Judging a Book by its Cover: e-Books, Digitization and Print on Demand". In Gorman (2002): The Digital Factor in Information and Library Services: International Yearbook of Library and Information Management 2002-2003". London: Facet Publishing. It is important to highlight the role of literary agents as intermediaries between authors and publishers.

[34] PA/BA Book Industry Supply Chain Steering Committee 2000: "Returns: the New Process. A Code of Practice". London: Book Industry Communication.

[35] Miyamoto, D., Whittaker, H. 2005: "The Book Publishing Industry in Japan and the UK: Corporate Philosophy/Objectives, Behaviour and Market Structure". Cambridge: University of Cambridge ESRC Centre for Business Research Working Paper series.

[36] Canoy, M., Van Ours, J., Van der Ploeg, F. 2005: "The Economics of Books". CESIFO Working Paper No. 1414.

[37] Miyamoto and Walker (op. cit. p. 17).

[38] Hyatt (op. cit. p. 17), EC 2005b: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- ICT adoption and e-business activity in 2005". Brussels: European Commission.

publishers. This increases the range and scope of the inventories that can be accessed by booksellers, making it possible to address customer demand more efficiently.[39]

- The rapid growth of book e-commerce, which has eroded the position of traditional distributors and retailers, appears linked to economies of scope in stock management, which make it possible for online retailers to store a greater diversity of titles in their "virtual inventory" and deliver them at cheaper prices to broader markets than their "brick and mortar" competitors (We briefly present the activities of Amazon.com the leading global eBookstore, in the Innovative Leader Overview 1 below).[40]

- The market uptake of eBooks (books distributed and reproduced in digital formats using dedicated or general-purpose hardware platforms) has been constrained by uncertainty regarding reproduction standards and digital rights management.[41] eBooks have only managed to make inroads in the markets of physical books in very specific areas such as digital Encyclopaedias, where their reduced size and multimedia and hyper-textual nature presents obvious advantages over that of their competitors.[42] It is however expected that the growing penetration of a new generation of devices such as PDAs and Smartphones, and the adoption of standards for the creation and presentation of high quality digital content will enhance the attractiveness of the platform for mass market, with a potentially radical impact in the prevalent industrial structure and business models within the sector.[43]

▪ **User interaction**

- The growing adoption of self-publishing technologies such as weblogs has created new channels for the promotion and discussion of books (linked to the emergence of virtual communities of book readers), and in some cases, the identification of new talent by publishers.44

---

[39] PA/BA Book Industry Supply Chain Steering Committee (op. cit. p. 18).

[40] Brynjolfsson, E., Smith, M. and Hu, Y. 2003: "Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers". Cambridge, Mass: Centre for e-Business @ MIT. Available at http://ebusiness.mit.edu/research/papers/176_ErikB_OnlineBooksellers2.pdf

[41] TENIA Consortium (op cit. p. 14).

[42] Greenstein, S. and Devereux, M. 2005: "The Crisis at Encyclopædia Britannica". Kellogg School of Management, Northwestern University Case Study available at http://www.kellogg.northwestern.edu/faculty/greenstein/images/htm/Research/Cases/EncyclopaediaBritannica.pdf

[43] Vaknin (op. cit. p. 17).

[44] Morrell, S. 2006: "Book Publicity in the Internet Era Promoting David Morrell's Creepers". Public Library Quarterly 24 (2).

In Figure 3 we depict the value chain of the Book sub-sector in terms of participants, alternative distribution models (in a context of growing online sales and growing adoption of eBook formats) and key technologies, while Table 1 in Section 3 contains a brief description of their likely impacts and also highlights European issues.

Figure 3: Actors and key technological areas in the book sub-sector
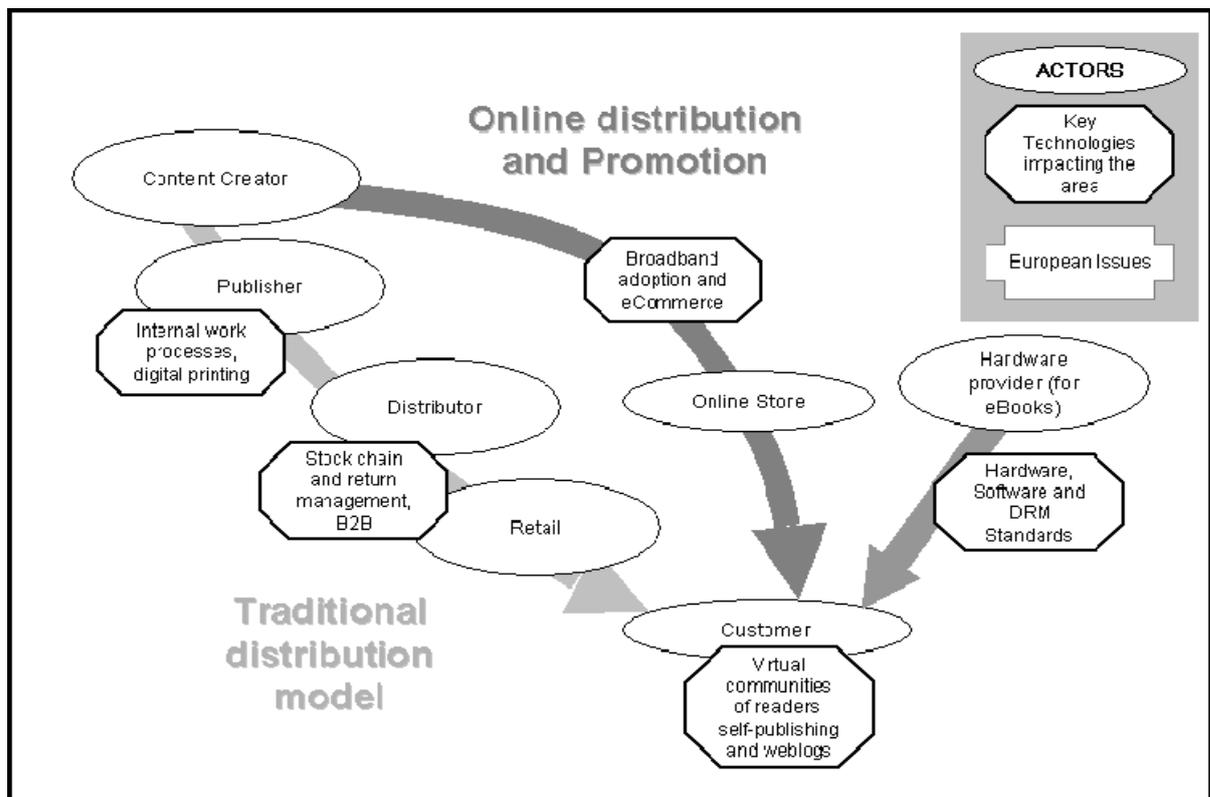
b) The music sub-sector

The music sub-sector comprises the recording, publishing, distribution and retailing of music goods.[45] Differently from physical books (where the medium for content distribution and reproduction is also the content), musical goods (albums and singles) require a technological platform for their reproduction, comprising a media where content is recorded (e.g. wax cylinders, cassettes, vinyl and compact disc records or mp3 files) and a reproduction device. These platforms have historically emerged after competitive standard setting processes and succeeded on the basis of their production and distribution costs or user convenience – e.g. miniaturisation.[46]

Traditionally, technological platforms for music reproduction have been open: the owners of reproduction standards grant their rights to consumer electronics manufacturers who develop compatible devices that compete in the marketplace on price and quality.[47]

The industrial structure of the music sub-sector shares several features with the book industry: it is characterised by a two-tier market where publishers (majors or independent) engage in the selection, publishing and marketing of records and singles, which are then sold by (increasingly online) retailers. The dominant business model follows the parameters discussed in sub-section 2.2.2: Publishers advance authors the resources necessary for the creation of music content in exchange of the rights over it, and pay them royalties once this advance is recouped from sales.[48] Processes of consolidation have led to the emergence of large mass-media conglomerates that own and fund a diversity of labels, as well as distribution and promotion channels including radio stations.[49]

In addition to their essential role in diffusion, radio stations are also important sources of revenue, as they pay royalties for the broadcast of music goods.[50] These are collected and distributed by copyright societies of publishers, writers and performers.[51]

The music retail sector has shown a trend towards consolidation as a consequence of economies of scale and scope in the selection and stocking of music. The use of

---

[45] See OECD 2005b: "Working Party on the Information Economy Digital Broadband Content: Music" for a detailed overview of the sub-sector and the impact of technological innovation on prevailing business structures. In the following discussion we focus on the recorded music market, leaving aside specific considerations concerning live performances, which can be considered as part of the 'performing arts' outside the scope of our Discussion Papers.

[46] In detriment of sound quality, according to some authors, see for example Hughes, J 2002: "Technology and the Degradation of the Musical Aesthetic Experience: Observations on the Historical Correlation Between the Increasing Technology and Declining Quality of Musical Recordings". Zicklin School of Business Working Paper series.

[47] This has changed with the emergence of the closely integrated iTunes-iPod platform

[48] See Albini, S. 1993: "The Problem with music". Originally published in The Baffler Vol. 4, available at: http://negativland.com/albini.html for a critical account of the revenue sharing model that characterises this model, and its stifling impact on the music industry's innovativeness: according to Albini, the advance model entraps bands into contractual relationships which are financially advantageous for publishers, and turn them into debtors who, eventually are forced to relinquish control over the creative process in order to cater for large audiences.

[49] Nguyen-Khac, T. 2003: "The Music Industry in a Dilemma: How New Technologies Can Turn an Industry Upside Down". Presented at the ITS Conference iin Helsinki, August 2003.

[50] Peitz, M. and Waelbroeck op. cit. p. 12

[51] Wolfe, Richard 1995: "Recording Artist's Royalties." Entertainment Law & Finance. no. 6 (1994).

creative content goods as loss leaders by generalist retailers including super-markets has strengthened this process.[52]

While the impact of ICT innovation in the book sub-sector has been limited to intra and inter-firm processes, and to a certain extent to online distribution, in the case of music it is bringing about radical structural changes in the sub-sector.[53] This is a consequence of the highly digitisable nature of music content goods, and their relatively small storage requirements (compared to, for example, video content), which make their reproduction and distribution through ICT networks extremely easy. In Figure 4 below, we illustrate the value chain of the Music sub-sector in terms of participants, alternative distribution models and key technologies.

Figure 4: Actors and key technological areas in the music sub-sector
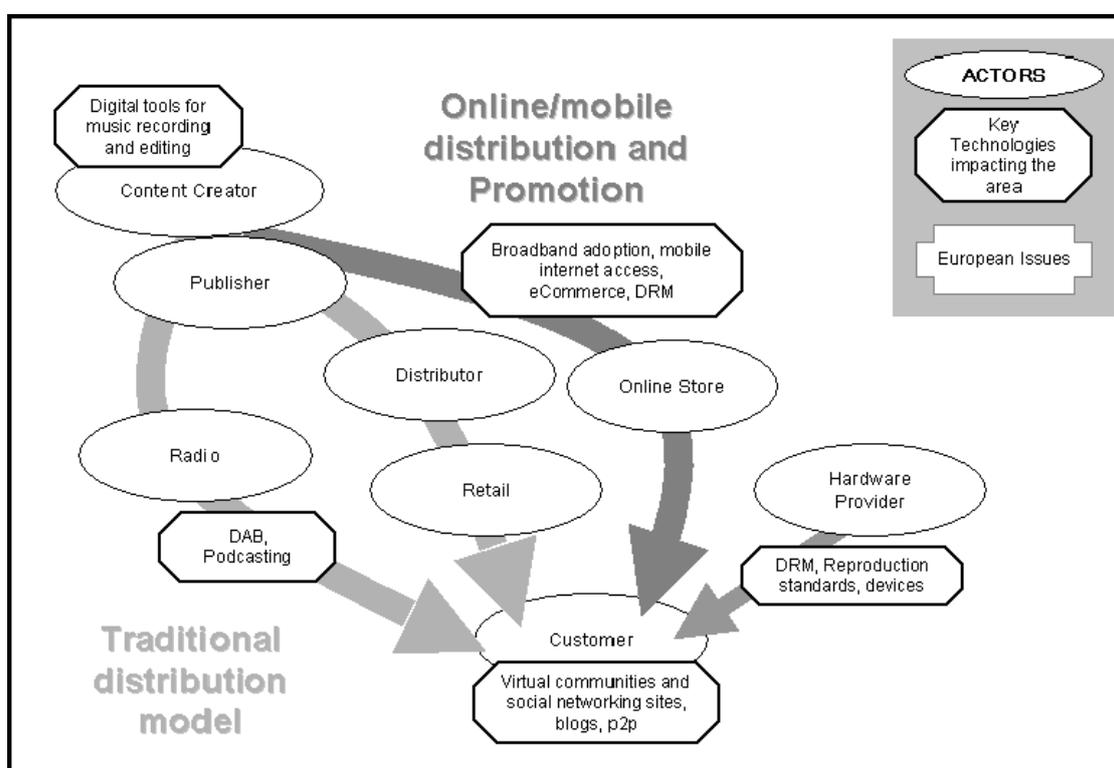
In addition, ICT innovation has had an important impact in the sector in a number of areas that are analysed below and are presented more in detail in Table 2 of Section 3 described within a European context.

▪ **Content creation**

- The growing availability of computer-based recording and editing technologies such as GarageBand or Ableton Live has decreased the costs of producing high quality recordings, and thus lowered barriers to entry in the market by smaller players.

---

[52] O'Kane, J 2004: "The Tide is High But They're Holding On: Are Traditional Music Retailers in the UK All Washed Up?". Report for Music Tank Sound Business Ideas available at:http://www.musictank.co.uk/retail.htm

[53] MusicTank 2006: "Beyond the Soundbytes: The Music Tank Report". London: Musik Tank.

▪ **Content distribution**

- The dominance of the Digital Rights Management-free MP3 format as a standard for digital music distribution and reproduction has brought forward the emergence of illegal file-sharing communities that use peer to peer services such as Kazaa, Soulseek, LimeWire or BitTorrent.[54] Major record labels and artists have accused these services as being responsible for decreases in records sales, and attempted to hinder their activities through lawsuits and the implementation of Digital Rights Management technologies in digital audio-storage media. The unpopularity of the restrictions that these measures impose in fair uses of such media, their inter-operability problems and the success of technology savvy users at eventually cracking them has restricted their adoption and effectiveness.[55] It has also been argued that file-sharing networks enable broader music distribution and sampling by users, and might contribute to raise artists' profiles, eventually contributing positively to record sales.[56]

- In addition to these illegal platforms, other alternatives such as Napster, mp3.com or Pressplay provide legal downloading services using novel business models based on advertising or subscriptions.[57] Although major labels have participated in some of these initiatives (e.g. PressPlay), they still seem to mistrust digital distribution channels. According to some authors, their caution is justified, as the widespread adoption of music digital distribution erodes their central position in the industry, by making it possible for content creators to establish closer relationships with their audiences without the need to resort to them for marketing and distribution.[58] We overview the position of the iPod/iTunes Music Store platform, which currently dominates the legal downloads music market, in the Innovative Leader Overview 2, below.

- Broadcasting (DAB) are also expected to impact the music industry's revenue models in terms of, for example, royalty determination and distribution. Given the prospective nature of the debate on the area, we focus on these issues in Discussion Paper 2.

- The growing availability of handsets with enhanced storage and music reproduction capabilities has increased the growth possibilities of online distribution of music in the mobile phone area (already economically important in terms of ring-tones).

▪ **User interaction**

- Blogs and other self-publishing tools, and social networking sites such as Myspace have become growingly important platforms for the distribution and

---

[54] Geer, D. 2006: "Digital Music Faces Incompatible Formats". Computer, Vol. 39 No. 4.argues that the dominant position of mp3 might be threatened by competitors incorporating stronger DRM features such as WMA, AAC or RealAudio, an issue in which we focus on Discussion Paper 2.

[55] The evidence in this area is controversial. Leibowitz (op. cit. p. 12) carries out a survey of available research and analyses the problems of measuring the impact of file-sharing on record sales. However, he concludes stating that "*given our current state of knowledge is that file-sharing hurts copyright owners and that it is responsible for most, if not all, of the recent decline in sales*".

[56] Peitz, M. and Waelbroeck op. cit. p. 12

[57] Meisel, J. and Sullivan, T 2000: "The Impact of the Internet on the Law and Economics of the Music Industry." Journal of Policy, Regulation and Strategy for Telecommunications. v. 4 no. 2 p. 16-22

[58] Nguyen-Khac (op. cit. p. 20).

sharing of music content. Myspace's initiative to enable a pay-per-download system through which unsigned bands registered in its site can sell mp3s directly to users lowers the costs of reaching an audience creates new channels for interaction between content creators and consumers, threatening the position of large music publishers.

Innovative Leader Overview 2: The iTunes/iPod platform

Apple has established a highly popular alternative to publisher and distributor- sponsored channels for the digital distribution of music: its model is based on the tight integration of the iTunes Music Store legal downloading site and its iPod mp3 players: Apple's revenues come from the sale of hardware devices, whose attractiveness is enhanced by the legal availability of a broad catalogue of competitively priced music ($0.99 per song), and protected by the relatively tolerant FairPlay Digital Rights Management system.

Apple's stronghold over the area (it currently has 70% of the market share in PC-based legal downloads) has placed the company in a key position in the sub-sector. However, there are concerns about the extent to which the close integration of Apple's proprietary DRM technology and its hardware might be locking-out competitors from the market (iPods cannot reproduce other audio formats, and music downloaded in the iTunes Music Store can only be played in iPods).

---

c) The audiovisual (television and feature film) sub-sector

We include inside the audiovisual sub-sector, activities of creation, publication, distribution and broadcasting of video content and feature films. Our definition is based on the characteristics of the creative content good being produced, instead of on the channels through which it is distributed (or the venues where it is displayed). This makes it possible to define some general aspects of the audiovisual sub-sector structure and value chain in order to focus, afterwards, on those specific characteristics which differentiate the two main markets that concern us, feature film and television.

Two aspects that set audiovisual content goods apart from the other content goods in which we have focussed so far (and situate them closer to video games) are their (generally) larger scale and the difficulty implicit in assessing the quality of a creative project before it is finished: differently from book manuscripts or songs, an audiovisual content good is, until it is shot and edited, a project in development that can only be gauged in terms of proxies such as the experience of the participants. These two factors elevate the level of investment necessary to engage in audiovisual content creation, and the risks of publishing activities (to which we refer using the term "production"), and favour consolidation and preponderance of large actors and mass media conglomerates.

Also, differently from the other sub-sectors in which we have focussed, the number of channels for audiovisual content consumption has traditionally been scarce (i.e. there is, or was, until the advent of internet distribution and digital television, a small

number of film theatres and television channels).[59] This feature, together with economies of scale in content aggregation and distribution increases the importance of distributors (this is, film distributors and television channels), who in addition to logistic functions, also select available audiovisual content for mass distribution.[60]

Having briefly characterised some essential features of audiovisual content we focus now on the specific characteristics of the feature film and Television industry structures and business models, to describe afterwards the impact that recent innovative trends in the area of content digitisation has had on them:

- **Feature films-** The basic model for film production is based on the assemblage of ad hoc teams of freelancing creative actors (e.g. actors, director, scriptwriter, photography etc.) in a project financed by a producer, in charge of the distribution and marketing of the film. Differently from the case of the music industry, this financing should not be understood as an advance, but as an investment, with returns specified as a share of the revenues from the box office, retail and other ancillary products (e.g. merchandise). The role of distributors in this process is essential: in some cases (particularly Hollywood) they are vertically integrated by major studios while in others they are independent and focus on distribution to niche or local markets.[61] Box office revenue has lost importance in the last decade as theatrical audiences dwindle, and current revenues from DVD sales and rental represent a larger share of the sub-sector's turnover.[62] This process of channel diversification has increased the 'shelf-life' of feature films and contributed, to an extent, to reduce production and distribution risks, with a larger share of feature films being released directly to the DVD market. The role of large retailers, with an important participation by supermarkets and other generalist stores has become growingly important in the sub-sector.

- **Television:** In terms of the value chain framework we have used to organise our analysis of industrial structure and prevalent business models in the creative content sector, television broadcasters can be conceived as simultaneous content publishers and distributors who acquire the rights over programmes produced (using freelance or studio models) in-house or by independent producers, aggregating them in their programming schedules.[63] Digital operators go one step forward by aggregating channels into their platforms.

    There are two main models for access to audiovisual content via television, a traditional one based on open access for the audience, and financed through advertising and public support, justified in terms of television's public value and

---

[59] The situation would be analogous to that of, for example, live music performances. Compare this case with recorded music, where the channel for diffusion of a musical good are the shelves of retail stores, broadcast radio stations and, finally, reproduction devices (all of which are relatively abundant).

[60] There is no such scarcity, or need for additional filtering of content in the areas of video and DVD rental and retail, which constitute alternative channels for access to the market for certain types of audiovisual content (e.g. straight to video film market).

[61] Scott, A. 2002: "A New Map of Hollywood: The Production and Distribution of American Motion Pictures". Regional Studies, Vol. 36 (9). Pp. 957-992.

[62] New York Times 2004: "Box Office in a Box". November 14, 2004.

[63] This includes, film studios whose production is in some cases financed by Television broadcasters in exchange for television rights after a certain period

strategic importance, and a more recent one provided by cable and satellite TV broadcasters, accessible on a subscription or pay-per-play basis.[64]

In Figure 5, we depict the value chain of the Audio-visual sub-sector in terms of participants, alternative distribution models and key technologies, while Table 3 in Section 3 contains a brief description of their likely impacts and also highlights European issues.

Figure 5: Actors and key technological areas in the audiovisual sub-sector
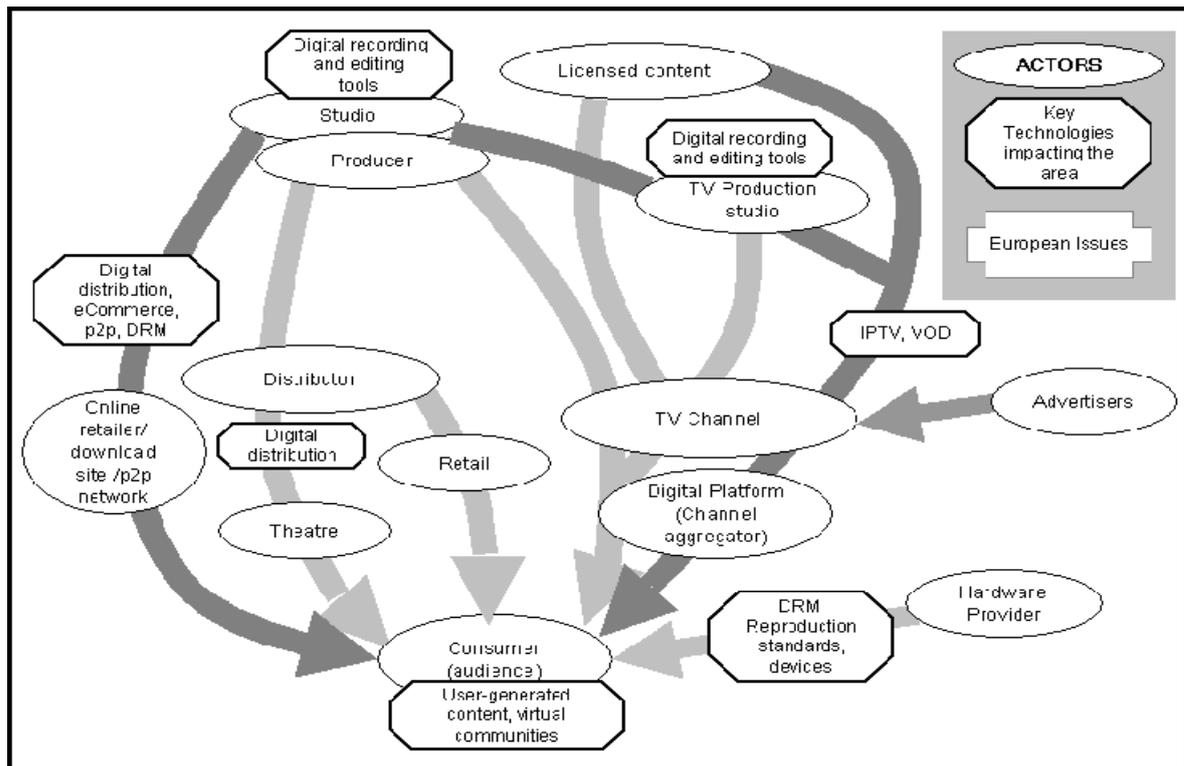
We briefly describe now the impacts that innovation in the ICT area has had in the production and distribution of audiovisual content:

- **Content creation**

- The use of technologies such as digital cameras, desktop editing tools and Computer generated Image (CGI) software in the area of audiovisual content creation, has reduced recording and editing costs and created new possibilities for artistic expression.[65]

---

[64] Brown, A. 1999: "Economics, Public Service Broadcasting and Social Values". Journal of Media Economics, 9 (1) pp. 3-15. The highly regulated nature of the Television medium is one of the sub-sectors defining features, and one in which we focus on Discussion paper 3.

[65] Zhu, K. (2001): "Internet-Based distribution of Digital Videos: The Economic Impacts of Digitization on the Motion Picture Industry". Electronic Markets Volume 11 (4). Pp 273-280

- **Content distribution**

- The replacement of celluloid reels with digital technologies, although delayed as a consequence of uncertainty about the implementation of Digital Rights Management technologies to avoid piracy, is expected to increase the efficiency and flexibility of film distribution and render the traditional investment on physical infrastructure it entailed unnecessary.[66]

- The growing reproducibility of audiovisual content in digital formats has created a piracy problem for the audiovisual content sub-sector, particularly in the film area: this issue has a traditional offline dimension (i.e. illicit copying and redistribution of copyrighted material via bootleg DVDs) and a growingly important online one (distribution of digital copies of copyrighted material through file-sharing networks such as those described in the case of the music sub-sector)[67]. The film industry has attempted to address these issues legally and politically (through trade policy measures) and technically: in the case of the latter approach, the adoption of different regional DVD standards to thwart pirates has been unsuccessful as in many cases illegal copies of a feature film are created using recording devises carried into theatres. More stringent Digital Rights Management measures in new DRM formats, High Density DVD and Blu Ray have also been implemented.[68]

- Online rental services, pioneered by Netflix, are becoming more important as channels for the distribution of DVDs, and are progressively moving forward to legal film downloads. They present advantages in terms of stock availability and management analogous to those presented for online bookshops.

- Digital distribution of feature films through Video on Demand (VOD) and platforms such as IndieFlix has emerged as another channel for audience-building, especially for "independent" films.[69] The adoption of digital strategies lowers barriers to content publication, increases the bargaining power of content producers over studios and creates a 'testing' environment from which larger players can select success cases for mainstream distribution. The final result is an increase in the range of diffusion for smaller film-makers, and broader diversity of content available for consumers. User-generated repositories of video content are the other face of VOD, we illustrate their activities in Innovative Leader Overview 3.[70]

- The switchover to digital Television and the emergence of Internet Protocol Television has reduced the infrastructure investments necessary to operate a Television channel and led to an explosion in the population of broadcasters,

[66] Wired 2005: "Hollywood Plots End of Film Reels". July 28, 2005. Available at http://www.wired.com/news/digiwood/0,1412,68332,00.html

[67] Chellappa and Shivendu 2003: "Economics of technology standards: implications for offline movie piracy in a global context". Proceedings of the 36th Annual Hawaii International Conference on System Sciences, 2003.

[68] Rosenblatt, B. 2006: "2006 Year in Review: DRM Technologies". Available at http://www.drmwatch.com/drmtech/article.php/3650401/. As of the writing of this Discussion Paper, the copy protection measures for these two formats had already been broken.

[69] The Age 2005: "Will internet video kill the television star?" Available at http://www.theage.com.au/news/technology/will-internet-video-kill-the-television-star/2005/10/08/1128563033411.html

[70] Zhu (op. cit. p. 23), New York Times 2005: "Once it Was Direct to Video, Now it's Direct to the Web". Oct 23, 2005.

increasing the diversity of available channels and the competition for limited advertising resources, with the ensuing move towards the provision of subscription-based access and a rise in the price of rights over premium content that make a channel or platform attractive.[71] These emerging digital platforms also create new conduits through which content creators, publishers and distributors can interact with consumers.

Innovative Leader Overview 3: YouTube

User-created digital distribution channels for video content such as YouTube are becoming growingly important in terms of audience, and their use has become an essential component of promotional strategies in, for example, pop music. YouTube, recently purchased by Google, provides its users with tools for the uploading and sharing (through embedded tags) of content, and finances its activities through advertising (there has been a recent announcement regarding plans to introduce subscription services in the platform) However, copyright owners have expressed their concern about the presence of unauthorised content in these platforms. These problems are being currently addressed through the implementation of technical measures such as watermarking that restrict the uploading of copyrighted content. However, a considerable share of YouTube content seems to incorporate very familiar musical soundtracks and infringement issues may continue to affect this new channel for user content distribution.

- **User interaction**

- Widespread internet penetration in industrialised countries has given rise to the emergence of virtual communities of film and Television series fans who interact closely with content producers and owners as part of promotion and consumer-generated marketing also engaging, in some cases, in content creation activities themselves.[72] The business models and Intellectual property arrangements through which these interactions take place are still a subject of experimentation which we analyse in Discussion Paper 2.

d) The video game sector

Although video games are relatively young compared to the other creative content goods we are focussing on, the spectacular growth and remarkable degree of innovativeness of this sub-sector warrant its inclusion in our discussion papers.

This sub-sector presents a number of special characteristics, such as the technical, ICT-intensive nature of the creative activities undertaken inside it, or the existence of a diversity of markets for video games, linked to the diverse platforms where they are played, each of which is characterised by different industrial and technical infrastructures and dominant business models. The first aspect is reflected in the slightly modified version of the sub-sector's value chain presented in Figure 6, which incorporates the 'developer' as a new actor that creates or licenses content as part of

---

[71] Andersen 2002: "Outlook of the development of technologies and markets for the European Audio-visual sector up to 2010". Available at
http://ec.europa.eu/comm/avpolicy/docs/library/studies/finalised/tvoutlook/tvoutlook_finalreport_short.pdf. The higher levels of competition for advertising budgets are also a consequence of inter-sector dynamics (e.g. growing importance of video games as settings for product placement, see Level 80 2007: "Advertising Industry Changes Course". 18 January 2007. Available at http://www.level80.co.uk/advertising_industry_changes_course_video_games_vs_movies.htm).
[72] Shefrin, E. 2004: "Lord of the Rings, Star Wars, and participatory fandom: mapping new congruencies between the internet and media entertainment culture". Volume 21, Number 3. Pp. 261-288.

its technical development activities, using middleware (tools and components) which result in a software product which is published and distributed through a diversity of channels, finally reaching users (gamers) who play it in a hardware platform purchased from a suitable provider.[73]

Figure 6: Actors and key technological areas in the video-game sub-sector
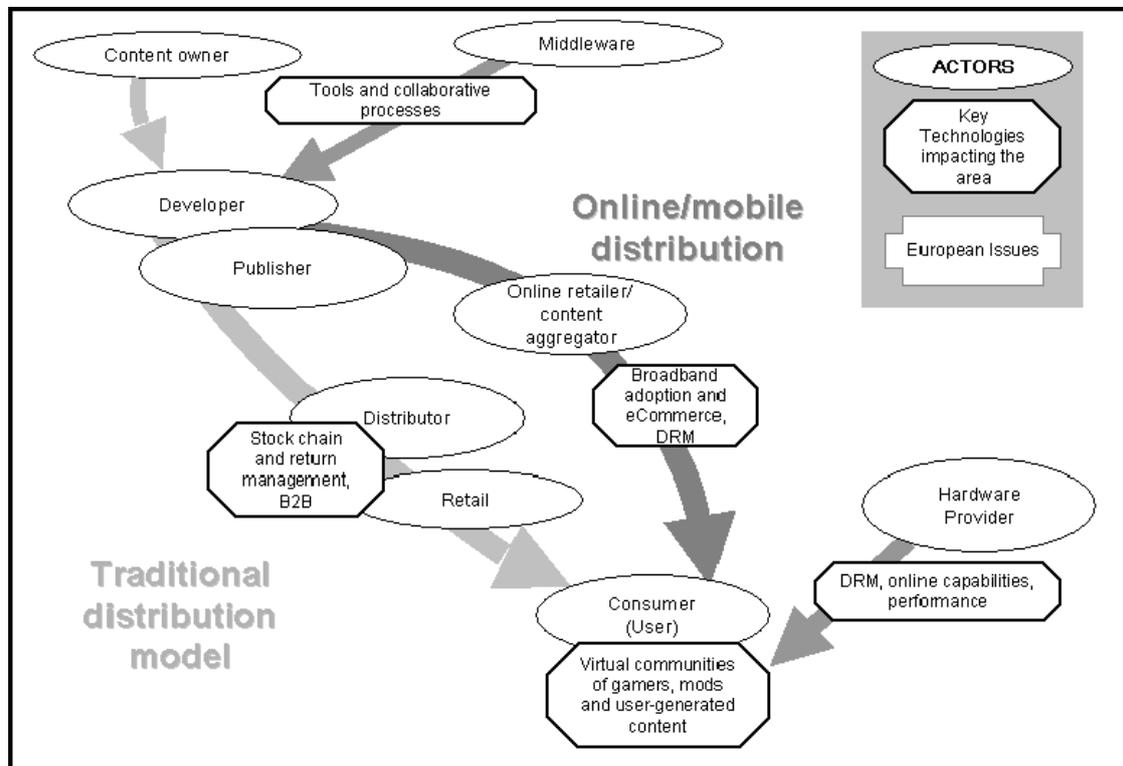
We briefly describe the structure of each of the markets that constitute this sub-sector, as well as the impact of ICT innovation on them next:

- **The dedicated video game console market:** The strong degree of concentration of the dedicated console hardware provider market (dominated by three companies, Microsoft, Nintendo and Sony) is a consequence of high barriers to entry: in addition to the substantial costs of developing, producing and marketing a dedicated console, its success depends on the availability of a broad range of attractive and compatible video games: development studios will not risk creating a video game for a console with a small or uncertain installed user base. It may also be true that the existence of a large personal computer based gaming market absorbs demand that might have supported additional entrants in the dedicated console market.[74]

---

[73] See OECD 2005a: "Working Party on the Information Economy Digital Broadband Content: The online computer and video game industry". Available at http://www.oecd.org/dataoecd/19/5/34884414.pdf for a comprehensive overview of the sub-sector.

[74] The situation of the handheld dedicated consoles is analogous to the one described for home entertainment ones.

The business model of hardware providers relies on royalties on video game sales paid by video game publishers, as well as the sales of video games developed internally. Price competition between console providers is vigorous - consoles are sold to users at a loss. Console providers manage access to the tools necessary for the development of video games compatible with their platforms tightly, as part of their competitive strategy, and the acquisition of development kits by studios is expensive.

The need to realise advanced consoles' growing technical and graphical capabilities has led to rapid increases in the complexity and cost of video game development.[75] This, together with the growing importance of marketing and the licensing of third party content in order to enhance the visibility of a release has resulted in a spiral of costs, and an eventual process of consolidation in the development and publishing areas, with the emergence of 'super-developer' companies that diversify game development risks by carrying out several projects in parallel and the entrance of large, financially powerful media conglomerates attracted by high profit margins, and by the possibility of leveraging their content assets inside the sector.[76]

Online console gaming and distribution have acquired growing importance after the success of Xbox Live, and all next generation consoles can connect to hardware provider-managed online platforms where users after paying a monthly subscription by users, with additional services available on a pay-per-play basis (see Innovative Leader Overview 4 for a brief description of Xbox Live).

Innovative Leader Overview 4: Xbox Live

Microsoft's Xbox Live is the leading online platform for multi-player gaming and digital distribution of video games: Xbox Live works as a portal for owners of the Xbox and 360 dedicated video game consoles, and provides access to online gaming areas, gamer rankings and social network features such as friend lists which make it easy for users to track their friends' activities, find suitable teams for multi-player games etc. Although in principle any owner of a Xbox or 360 console has access to Xbox Live through a 'silver subscription', online gaming services are only available to subscribers who pay a monthly fee ('gold subscribers'), while premium content (such as video game downloads in the Xbox Live Arcade, and television shows) have to be purchased using Microsoft Points, the platform's micro-currency.

The Live Anywhere feature will make it possible to use some of Xbox Live's services via Mobile Phones with the Windows OS, and Microsoft Vista PCs.

- **The PC video game market:** The main difference between the industry structure of PC and console markets is the absence of concentration in the area of hardware provision in the former, as a consequence of PC commoditisation: The technical specifications of PCs are openly available, and PC video game developers are not

---

[75] ELSPA 2005: "THE GAMES INDUSTRY: A UK SUCCESS STORY- Call to Government for more support for one of the UK's most successful industries". ELSPA Press Release available at http://www.screendigest.com/reports/eig05/EBAN-6ALLKS/pressRelease.pdf

[76] The model followed in the distribution of revenue between developer and publisher is analogous to the one in the music industry (i.e. the publisher fronts the cost and the developer gets paid a royalty once those costs have been recouped) (Gurwin, D. 2004: "Video Game Convergences Pt. II- The Economics of the Gaming Industry". Available at http://www.etc.cmu.edu/about/press_articles/15.html).

required to pay any royalties on video game sales to PC manufacturers. Thus, the barriers to entry in the market are smaller, and survival in niche positions easier. This also makes it possible to experiment with innovative genres, playing modes and models for interaction between developers and users. The PC video game market has created a number of niche markets for hardware add-ons including graphics and audio cards as well as user interface devices which reinforce innovation in this sub-segment.

- **Massive multi-player role playing games:**[77] In contrast to console and PC games, which are purchased as shrink-wrapped products, most Massive Multi-Player Online Role-Playing Games (MMORPGS) use a hybrid revenue model, with an initial purchase or download of the basic software necessary to run the game (including a free playing period), and the subsequent payment of subscription fees. The MMORPG field is relatively new, and several companies have experimented with new business models to diversify revenue streams and enhance their competitiveness (e.g. pay-per-play and advertisement-supported models). The possibility for players to create content that can be sold or exchanged inside and/or outside the game adds an extra economic dimension to this growingly important environment.

  There are elevated barriers to entry in the MMORPG provider market cause by the high costs of developing and maintaining its infrastructure, and network externalities (the value of the network increases exponentially with its population. These features, which could lead to strong processes of market concentration are constrained by the heterogeneous nature of demand (for example regarding MMORPG genres) and congestion processes which emerge when large participant populations start putting stress on a MMORPG technical infrastructure, decreasing the quality of its services and stabilising its size.[78]

- **Browser video game markets:** This category includes video games usually written in the Java or Flash programming languages, which can be played online (usually in a PC) without the need to install any additional software. They include casual games available through Internet Service Provider and game portals. They tend to be less sophisticated, less costly to develop and shorter-lived than console, PC and online video games, and they target a younger/more casual gaming audience.[79]

  This sub-sector's value chain is dominated by the online publishers who select, aggregate and markets collections of online browser video games developed by small studios, either independently or as commissions. In some cases these games are freely available to users (and supported via the enhanced advertising revenues brought by increased site traffic) while in some others users have to pay per play or subscribe to the portal.

---

[77] Multi-Player Online Role-Playing Games are online virtual environments where large numbers of participants (represented by avatars) can engage in a diversity of collaborative (or conflictive activities). An essential difference between them and other gaming environments is that they keep evolving in the absence of individual players. The largest current MMORPG is World of Warcraft, with 7 million of subscribers (1 Million of which are European)

[78] Castranova, R. 2003: "On Virtual Economies". Game Studies. Vol. 3 Issue 2. (Dec). Available at http://www.gamestudies.org/0302/castronova/#top

[79] ACTeN 2004: "Mobile Games E-Content Report 3". Available at http://www.acten.net/uploads/images/382/IR3_010304-2.pdf

- **Portable/mobile video game market:** This category includes video games played in mobile phones and other portable devices. This market also presents relatively lower development costs and online distribution managed by content aggregators instead of video game publishers. Telecommunication companies play an important role by selecting, aggregating and marketing collections of games in portals from which they can be downloaded by consumers (who pay subscription fees or on a pay-per-download basis). Games are perceived as complementary assets that increase the attractiveness of a carrier's services and provide high revenue margins.[80]

The mobile/portable market is technologically fragmented between the Symbian and Microsoft Mobile Operating systems. This fragmentation increases development costs, as it makes it necessary to port games to a diversity of platforms. There are different business models regulating the interaction between game developers and software platform providers: for example, in the case of Symbian, access to the platform is free for developers, while its providers obtain royalty fees on the sale of handsets from manufacturers.[81]

As it was the case with the previously discussed sub-sectors, the video game industry presents an industrial and business structure characterised by the central position of publishers as sources of funding for the creation, distribution and marketing of video games.[82] The growing importance of online distribution and gaming should have an important impact in the sector, which we analyse in Discussion Paper 2.

e) Museums and libraries

Differently from the other sub-sectors we have considered, museums and libraries do not deliver creative content goods, but collections of them: they fulfil aggregation, selection and preservation functions that in a context of widespread availability of information and constant changes in data storage standards, are becoming progressively more important.[83] The enhancement of their public access character brought by digitisation appears linked to issues in the area of e-Learning that boost their relevance even further.[84] We consider that the process of collection acquisition, management and preservation constitutes the 'creative content production' function inside our framework (see Figure 7), while distribution pertains this content's presentation (in a physical or digital space), and user interaction is concerned with those areas and tools through which visitors use these institutions and their content (e.g. in terms of provision of feedback, access to catalogues and guides, downloading of open content for creative modification etc.).

---

[80] Ibid.

[81] This constitutes an example of an open standard established by handset manufacturers in order to commoditise mobile phone Operating systems (establishing an stable platforms, which reduces uncertainty and gives incentives for software developers to create compatible applications, increasing its attractiveness). Microsoft has adopted for the opposite strategy, organised around the creation of a proprietary software platform incorporated into third-party, cheap handsets. See Evans et al op. cit. p. 14 for a discussion of the Symbian model.

[82] The dedicated console market, which presents analogies with the hardware-centric ecosystem emerging around Apple's iPod constitutes an important exception.

[83] EC 2002b: "The DigiCULT Report- Technological landscapes for tomorrow's cultural economy: Unlocking the value of cultural heritage". Brussels: European Commission.

[84] This is particularly relevant in certain areas such as academic journals (OECD 2005c: "Working Party on the Information Economy Digital Broadband Content: Scientific Publishing").

Another essential distinguishing feature of libraries and museums is their role as public repositories of knowledge and art.[85] As such, and given their non-for-profit nature, with an important reliance on public funding and grants from charitable societies and foundations (complemented with entrance fees or other revenue sources),[86] it would be misleading to discuss their operation in terms of business models. Instead, we focus on those areas of ICT innovation that have had an impact in their efficiency and accessibility:

- The growing availability of software for content management (including a wide-range of Open Source programs), enables museums and libraries to carry out classification and archiving tasks (one of their essential functions) more cheaply and efficiently. When properly implemented, these systems can contribute to reduce their operational costs. Their integration with user-friendly Online Public Access Catalogues (OPAC) interoperable between different digital libraries should also contribute to improve their efficiency and user satisfaction.[87]

- Online access to digital content stored in libraries and museums is another essential area where ICT innovation is having a radical impact: the possibility of parallel access to digital content by multiple users addresses the essential scarcity of resources that characterises physical collections (i.e. only a limited number of copies of a book or document available in the catalogue). Libraries are progressively becoming pivotal markets for eBooks.[88]

- Digital access and distribution have created opportunities for new types of content collections, such as multimedia repositories, in some cases made available through Open Source licenses by institutions such as the BBC in its Creative Content archive initiative, briefly described in the Innovative Leader Overview 5.[89]

Innovative Leader Overview 5: BBC Creative Content Archive

The British Broadcasting Corporation (BBC) archive is currently assessing the Public Value of its project to create a site from where its video, audio and still archives can be downloaded by users in the UK under an Open-Source like license which will enable them to modify the content they download and redistribute it for non-commercial purposes. In addition to contributing to fulfil the public service remit of the corporation, by for example, enhancing the possibilities of integrating multi-media content in educational courses via its TeachersTV section, these remixes and mash-ups of archival material could be re-incorporated into the BBC's programming via initiatives such as the Superstar VJ sites mix competition, and signal talented creators that could be hired or contacted for commissioned work.

Digital museums are also a promising area for experimentation with growingly sophisticated virtual reality technologies which should contribute to enhance

---

[85] We leave aside in our discussion private "for-profit" museums, with a business model not different from that of theme parks and other tourist attractions.

[86] Frey, B. and Meier, S. 2003: "The Economics of Museums". Zurich: Institution for Empirical Research on Economics Working Paper Series.

[87] Besser, H. 2002: "The Next Stage: Moving from isolated digital collections to interoperable digital libraries". First Monday, 7 (1). Available at http://www.firstmonday.org/issues/issue7_6/besser/#author

[88] This in spite of uncertainties regarding the Digital Rights Management and parallel loaning of digital copies, which has made commercial publishers cautious when incorporating their content to digital collections. See Garrod, P. and Weller, J. 2005: "Ebooks in UK Public Libraries: where we are now and the way ahead". Report for the British Council available at http://www.ukoln.ac.uk/public/nsptg/e-books/ for an overview of the situation of eBooks in the UK's public library service.

[89] Wired 2004: "BBC to Open Content Floodgates". June 16, 2004.

accessibility and maximise the ratio of public exhibits to collection, constrained, in the physical medium, by the availability of space.[90]

- Museums are an important distribution channel for works of art from disciplines such as painting or sculpture that are not covered in the context of our Discussion Papers; their future evolution in terms of, for example, implementation of virtualisation and tele-presence technologies might have an impact on the possibilities of new artists trying to reach an audience.
- Standard setting processes for data storage appear linked to the function of digital libraries and museums as preservers of cultural heritage.

In Figure 7, we depict the value chain of the cultural-space sub-sector in terms of participants, alternative distribution models and key technologies, while Table 5 in the following Section 3 contains a brief description of their likely impacts and also highlights European issues.

Figure 7: Actors and key technological areas in the cultural space sub-sector
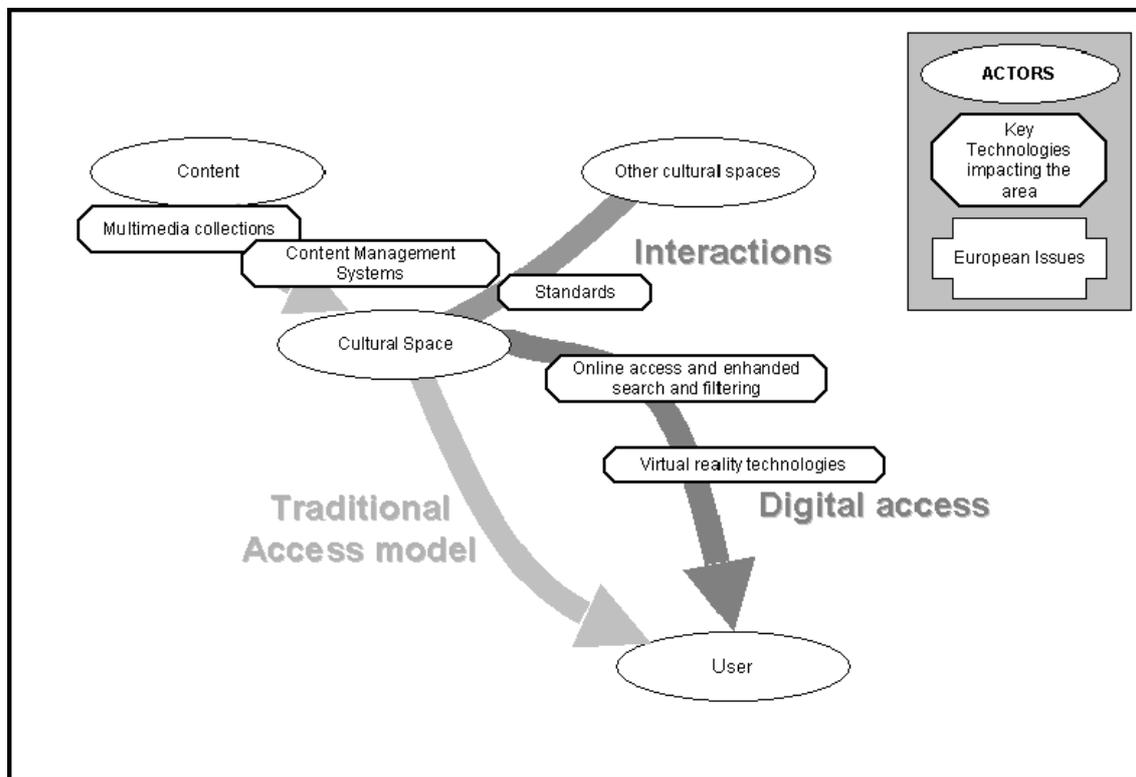
---

3. SITUATION OF THE EUROPEAN CREATIVE CONTENT SUB-SECTORS

After characterising, in Section 2, the industrial, business and technological characteristics of the Creative Content Sector and the sub-sectors in which we are focussing in our Discussion Papers, we now describe the specific situation of the European players in a global context. Our goal is to, using quantitative and qualitative data, considering national and industrial initiatives, illustrate their competitive and technological position and devise a 'present scenario', starting point of our analysis of the impact of emerging ICT innovative trends, carried out in Discussion Paper 2.

Given the state of the available data (presented at different levels of sector and national aggregation, and for diverse currencies and time periods) we will refrain from engaging on any comparative or descriptive statistical analysis beyond what is useful to illustrate the state of the sector in order to introduce and complement our qualitative assessments, which are based on the analysis of a broad range of policy, business reports and company documents, and classified inside the areas of 'content creation', 'content distribution' and 'user interaction'. Tables 1 to 5 describe the key European features of each sub-sector taking into account the innovative trends in ICT described in the previous section.

3.1 The European book sub-sector

a) Sub-sector overview

According to consultants PricewaterhouseCoopers (PWC) estimates, the book sector comprised, in 2001, 4.4% of the total value generated in the Entertainment and Media market; its importance was forecasted to decrease to 3.9% by 2006.[91] In spite of decreasing trends in reading in the European population, the sub-sector's turnover has remained stable during the last years.

According to 2007 PWC[92] estimates, the print book market in Western Europe will rise to $52 billion in 2011 from $47 billion in 2006, a 2.0% compound annual increase. Central and Eastern Europe will be the fastest growing area, with a 3.0% compound annual advance. Spending will total $4.3 billion in 2011, up from $3.7 billion in 2006. Germany had the largest book market in the region in 2006 with spending of $11.6 billion, followed by France ($8 billion), the UK ($7.1 billion), Spain ($6.7 billion) and Italy ($5.2 billion).

The tendency to collect data on the 'Publishing and Printing industry' aggregate, limits the extent to which it is possible to quantify the economic importance of books as an individual sub-sector.[93] In aggregated terms, the Publishing and Printing sector accounted, in 2001 for 0.5% of the EU-15 GDP, had an output of €121 Billion, and

---

[91] European Foundation for the Improvement of Living and Working Conditions 2003: "The Future of Publishing and Media". Dublin: EFILWC

[92] PriceWaterhouseCoopers Global Entertainment and Media Outlook 2007- 2011
http://www.pwc.fr/global_entertainment_and_media_outlook_2007-_2011.html

[93] Kovac, M. 2004: "Patterns and Trends in European Book Production and Consumption: Some initial observations". The Public, Vol. 11 (4) pp. 21-36., EC 2005c: "Strengthening the Competitiveness of the EU Publishing Sector" Brussels: European Commission. Available at http://europa.eu.int/information_society/media_taskforce/doc/prerelease.pdf

employed 750.000 people. In 2002 Europe exported publishing goods worth €5.077 Million (five times more than the US) and imported €2.656 (Two and a half times the US): Europe is the largest market for publishing goods in the world.[94]

The Book sub-sector is the third most important constituent of the Printing and Publishing industry, and represents 24.6% of its value in Europe.[95] According to Eurostat, its EUR15 turnover was, in 2001, of €32 Billion.[96] In 2000, the total reported sales in the sector were €26.6 Billion. The UK, Germany, France, Italy and Spain comprise 84% of the value added in the European Book sub-sector.[97] It employs 33,000 people in the UK, 14,600 in Spain, 25,000 in Germany and 13,000 in France.[98]

Further PWC found out that electronic book sales across all categories (i.e consumer, educational and professional books) have grown rapidly from a small base, more than doubling during each of the past four years to $188 million in 2006. One of the explanations put forward by PWC is the impact of growing broadband market which is fuelling the nascent electronic book market. This trend should go on with the increase in broadband connections which facilitate download.

Professional books represent a large share of the total electronic book market. The impact of electronic books on consumer books is being constrained by fixed-price policies imposed on the book sector by national laws, removing the price advantage that digital books would otherwise offer users. PWC expects electronic books to continue to grow rapidly during the next five years, rising to $1.8 billion in 2011, a 57.4% compound annual increase.

The European book market is fragmented along linguistic lines; there are important differences in the industrial structure and revenue stream composition of different countries linked to several factors such as the heterogeneity of reading habits and policies (e.g. price intervention in the book market), concentration of retail channels and export potential (where Spain and the United Kingdom present important advantages).[99]

The largest European national book markets publish more titles per capita and exhibit less publisher concentration than the US: European book publishing is not seen to suffer from the same competitive gap with the US and Japan as other industrial sectors.[100]

According to a quantitative assessment of the competitiveness of the European Printing and Publishing sector carried out in 2003, there is a positive correlation between publisher size and labour productivity, possibly linked by the greater uptake of ICT technologies to increase the efficiency of internal work processes in larger firms.[101]

---

[94] Ibid.
[95] Ibid.
[96] EC 2004a: "Publishing Market Watch Final Report". Brussels: European Commission.
[97] EC 2003 Op. cit p.11
[98] EC 2004a Op. cit. p. 31
[99] Canoy et al. 2005 op. cit. p. 18
[100] EC 2005c Op. cit. p. 31.
[101] EC 2003 op. cit. p. 11.

Table 1: ICT innovation in the European book sub-sector.

Area	Key Technologies	Impacts	European Context
Content Creation			
	Digital content and electronic document management, print-on-demand and digital printing	Reduction of the costs and risks of publication enhancing the entrance of smaller actors	Growing adoption, particularly in the case of larger companies
Content Distribution			
	Automated systems for stock and return management	More efficient physical distribution processes make it easier for retailers to address demand	Growing adoption, particularly in the case of larger companies
	Book eCommerce	Availability of large virtual inventories of goods at competitive prices	Slow growth, except in the UK. Growing perception of online opportunities by innovative publishers
	eBooks	Enable the digital distribution of book content into hardware devices, with an important impact on the sector value chain and potential processes of re-intermediation	Niche market in the absence of suitable devices and incompatibility between DRM standards.
User Interaction			
	Blogs and other self-publishing tools	New channels for promotion and discussion, new opportunities for talent to reach an audience	Growing blogging population

Table 1 above presents a brief description of key-technologies, their impacts and some European context highlights which are more in detail discussed below.

b) European features

▪ **Content creation**

- **Adoption of ICT for internal work processes**: The e-Business W@tch assessment undertaken in 2005 shows growing adoption of ICT technologies for knowledge and electronic document management and other internal processes in Printing and Publishing companies.[102] This trend is stronger in the case of larger companies. Smaller publishers and booksellers have so far been reluctant to implement sophisticated ICT systems as a consequence of their high cost, and scepticism about their advantages.

- **Prevalence of national publishers**: Differently from the other content sub-sectors in which we are focussing (where there is a dominance of US and Japanese owned media conglomerates over the publishing markets), in the book sub-sector there is a preponderance of European owned companies.[103] This appears linked to the high specificity of national markets to which we referred above.

---

[102] EC 2005a: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- ICT adoption and e-business activity in 2005". Brussels: European Commission.
[103] European Foundation for the Improvement of Living and Working Conditions 2003 op. cit. p.31

- **Content distribution**

- **Online opportunities:** European publishers tend to approach the online environment as a marketing, rather than distribution, channel.[104] This appears linked to the relatively small size of Internet sales, (only significant in the UK, with 17% of the total book sales), and to the dominance of generalist online bookstores such as Amazon, who generate added value for customers through aggregation of collections from different publishers, and the provision of virtual community services.[105] Czech publisher Grada Publishing constitutes an example of the successful application of such strategies at the European level.[106]

- **Small eBook market:** The European eBook market appears underdeveloped in comparison to the US. This is in part a consequence of uncertainty regarding technical and digital rights management standards and also because of lack of demand.[107]

- **Consolidation in retail:** There has been, especially in countries with no minimum fixed price for books, a process of consolidation in the retail sector. The market power of large bookstore chains makes it possible for them to impose harder conditions on publishers and distributors, and threatens the survival of smaller bookshops, potentially reducing available distribution channels for niche publishers.[108]

- **User interaction**

- **Growing importance of blogs:** The European blogging population is still small compared to the USA.[109] Its adoption appears to be particularly strong in France, especially in the area of citizen journalism.[110] In the case of the book sub-sector, characterised by mature distribution channels, which in many cases hamper communication, between publishers and end-users, the adoption of online communication strategies including blogs, mailing lists and Internet forums constitute an opportunity for these actors to gauge demand and reduce publishing risks.

---

[104] EC 2003 op. cit. p. 11

[105] Canoy et al. op. cit. p. 18

[106] EC 2005a: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- Key Issues and Case Studies". Brussels: European Commission.

[107] EC 2003 op. cit. p. 11, EC 2004a op. cit. p 31, Screen Digest, Goldmedia, Rightscom and CMS Hasche Sigle 2006: 'Interactive Content and Convergence- Implications for the European Society'. Brussels: European Commission

[108] EC 2004a op. cit. p 31.

[109] Forrester Research 2006: "Profiling European Bloggers". Press release available at http://www.forrester.com/Research/Document/Excerpt/0,7211,40515,00.html

[110] Journalism.co.uk 2005: "Interview with Guillaume Champeau, UK executive for AgoraVox". 7 December 2005. Available at http://www.journalism.co.uk/profiles/story1629.shtml

3.2. The European music sub-sector

a) Sub-sector overview

The global music sub-sector, with sales that amounted to $32 Billion in 2003, has seen a major fall in revenues (of 20% in the period from 1999 to 2003), which the major industry players have blamed on illegal distribution of copyrighted content, growingly taking place through file-sharing networks.[111]

However according to PWC global spending on recorded music will rise from $36.1 billion in 2006 to $40.4 billion in 2011, a 2.3% compound annual increase while global physical distribution will decline by 9.6% compounded annually to $17.6 billion in 2011 from $29.1 billion in 2006. PWC forecasts that the distribution of music in traditional physical formats will continue to decline in Europe over the next few years: physical recorded music spending in Western Europe is expected to decrease at a 7.7% compound annual rate to $6.7 billion in 2011 from $9.9 billion in 2006. In Central and Eastern Europe, spending will drop from $957 million to $685 million, a 6.5% decline on a compound annual basis.[112]

Europe is the second largest music market in the world (with 32.5% of worldwide sales) after the USA (which has 40%).[113] Sales of recorded music in Europe were of $11 Billion in 2003 (OECD 2005) while PWC assessed that those reached $14 Billion in 2004 (KEA 2006).[114] The UK has recently overtaken Germany, and it employed the full-time equivalent of 4,841 people in 2000.[115]

Legal music downloading is growing at accelerated rates, with digital music sales having doubled in value in 2006 to become 10% of industry sales. Around half of these sales take place through mobile phones (90% in the case of Japan).[116] The Europe online music market generated €120 Million in 2005, and it is expected to reach €1.1. Billion sales by 2010, or 30% of the overall European market by 2009.[117]

The global music market is dominated by 5 major record labels (BMG, EMI, Sony, Universal and Warner) that had, as of 2004, an aggregated global market share of 74.7% (81.8% and 80.6% in the USA and Europe, respectively). In most European countries, particularly France, local music has important market shares (in the range of 30%-50%), although access to foreign markets (especially the USA) is, with the exception of UK artists and Spanish artists in Latin America, negligible.

PWC foresees that growth in digital music distribution will drive spending worldwide, offsetting rapid declines in physical distribution. Increased broadband connections as well as wireless use will contribute to growing the digital music markets, even if piracy remains a problem.

---

[111] OECD 2005b: "Working Party on the Information Economy Digital Broadband Content: Music".

[112] See footnote 92

[113] KEA 2003: "Profile of the European Music Sector". Available at http://www.impalasite.org/docum/04-press/press_0302_1.pdf

[114] KEA 2006 "The economy of culture" (based on PWC 2006 – reports on consumer spending)

[115] It is important to emphasise the equivalence, given the free-lance/part time nature of employment in the sub-sector. National Music Council 2002: "Counting the Notes- The economic contribution of the UK music business". Report available at http://www.musiced.org.uk/features/counting_the_notes.pdf

[116] Screen Digest et al 2006 op. cit. 34, Telephia, IFPI 2007: "Digital Music Report". Available at http://www.ifpi.org/content/library/digital-music-report-2007.pdf

[117] OECD 2005b op. cit. p. 32

Table 2: ICT innovation in the European music sub-sector.

Area	Key Technologies	Impacts	European context
Content Creation			
	Digital recording and mixing tools	Lower barriers for content creation and entrance in the markets by new actors	No evidence of their adoption, although it appears likely to be growing, In many cases these tools may be pirated.
Content Distribution			
	p2p filesharing networks	Make it possible to download copyrighted content very easily, decreasing sales of records. Discovery effects and enhanced diffusion of music.	Still very important in several countries, although it has been contained in a context of growing broadband penetration.
	Digital distribution	Create new channels for distribution and open opportunities for new players such as hardware manufacturers (Apple), increase the diversity of available content.	Growing importance of digital only releases, creation of digital singles charts. eStore market very diverse, although currently dominated by Apple. Concerns about DRM standard fragmentation and anti-competitive policies
	Digital radio via Digital Audio Broadcasting and podcasts	New entrants in the area, and new channels for music distribution. Potential impact on the area of royalty distribution	Growing popularity
	Mobile distribution and music enabled handsets	Create new channels for distribution and open opportunities for new players such as mobile carriers.	Very promising mobile market with advantages over the USA in terms of network coverage and handset availability
User Interaction			
	Blogs and social networking sites	New channels for promotion and discussion, new opportunities for talent to reach an audience	Adoption of innovative distribution and promotion strategies by small independent labels and bands.

Table 2, above, presents a brief description of key-technologies, their impacts and some European context highlights which are discussed more in detail below.

b) European features

▪ **Content creation**

- **Digital only releases and lower barriers to entry**: 30% of music releases in the UK in 2006 were digital bundles:[118] Digital-only releases are becoming a growingly important strategy for the creation and distribution of content avoiding the costs and risks associated to physical production. An example of such phenomenon would be the success of previously unsigned group Koopa, who managed to reach the UK top 40 through digital singles sales (many through text message downloads), without resorting to mainstream distribution and marketing techniques.[119]

▪ **Content distribution**

- **A promising Mobile music market**: Europe presents a competitive advantage over the US in the area of mobile music distribution and consumption, as a consequence of more advanced infrastructures and wider availability of music-capable devices (with a penetration rate of 14% in Europe versus 2% in the USA). In 2005 36% of European music users use their mobile phones to listen to music, compared to 8% in the US.[120] Mobile music services already generate revenues of €76 Million and are expected to reach €687 Million by 2010.[121]

- **Electronic store diversity:** The e-store market is more diverse in Europe than in the US: there are 320 services available in Europe, and 20 available in more than one market.[122] This competitive environment provides independent publishers and artists with additional distribution channels to reach an audience, in some cases e-stores target niche markets using strategies aimed at creating virtual communities of users (e.g. Warpmart in the electronic music area). This European feature also promotes a more diverse hardware environment not so heavily dominated by the Apple iTunes/iPod platform. This service is nevertheless the market leader in the area, with a market share of, for example, 80% in the UK. This situation has led to several consumer and legislative initiatives aimed at enforcing compatibility between the store's downloads and hardware devices besides the iPod.[123]

- **Growing penetration of Digital Audio Broadcasting**: Digital Audio Broadcasting (DAB), based on a standard developed as part of the EU funded research project, is becoming growingly popular in the continent (e.g. 4.7 million digital radios have been sold in the UK since 1999). This technology gives listeners easily manageable access to a wider range of stations, increasing the

---

[118] IFPI 2007 ibid.

[119] BBC News 2007: "Unsigned band set to crash charts". 10 January 2007. Available at http://news.bbc.co.uk/2/hi/entertainment/6248535.stm . The move towards digital distribution is reflected in the recent creation of a digital singles chart

[120] 2005: "European mobile consumers use music phones to listen to music four times more than Americans". October 17 2005. Press release at http://www.telephia.com/documents/DeviceReleaseFINAL101705.pdf

[121] Screen Digest et al 2006 op. cit. p. 34.

[122] IFPI (2007) op. cit. p. 33

[123] PC Pro 2007: "French and German consumer groups join campaign to open iTunes". 23 January 2007. Available at http://www.pcpro.co.uk/news/102738/french-and-german-consumer-groups-join-campaign-to-open-itunes.html

diversity of music distribution channels, and impacting royalty revenues for artists and publishers. The uptake of DAB in the US has, on the contrary, been slow.[124]

- **User interaction**

- **New promotion strategies**: European independent record labels such as Domino or Island have demonstrated particular proficiency at the adoption of innovative promotion strategies using social networking and user generated sites and weblogs, which in some cases have made it possible for their artists to attain success not only at a local level, but also globally:[125] the Internet creates new opportunities to create (or find) audiences for new talent.[126]

- **Illegal music downloading and piracy in Europe**: In spite of the growth in the size and diversity of the European digital music market, the number of internet users who, in 2005, admitted downloading music illegally tripled those who purchased it online (15% versus 5%).[127] As of 2005 this trend was particularly strong in Spain and the Netherlands. However, according to IFPI, the growth of illegal file-sharing has been contained in spite of the fast growth in broadband internet penetration.[128]

3.3.   The European audiovisual sub-sector

a) Sub-sector overview

Our presentation of available data regarding the economic importance and market structure of the European audiovisual sub-sector is again divided into the two main areas in which we are focussing in this report, feature film and television:

The film entertainment market had, in 2001, an aggregated value of $59.485 Million (5.9% of the global media and entertainment market).[129] In 2000, the European feature film sub-sector had an estimated turnover of €4000 million, and was dominated by France, Germany, UK, Italy and Spain, which accounted for 67% of the total European production. In aggregated terms, Europe produced more films than the US (739 compared to 628), but the market share of US films in Europe was of 66%, compared to the 4.51% of USA market attained by European productions.[130]

---

[124] It is argued, as a consequence of the absence of government encouragement and incumbent hesitance to incorporate attractive, value-added features in their DAB services. Wired Jan. 2007: "Will Digital Radio Boom in U.S.?". Available at http://www.wired.com/news/technology/0,72514-0.html?tw=wn_index_3

[125] IFPI (ibid), Guardian 2007: "Independent's Day". 12 January 2007. Available at http://music.guardian.co.uk/rock/story/0,,1988019,00.html

[126] Dufft, N., Stiehler, A., Vogeley, D., Wichmann, T. 2005:"Digital Music Usage and DRM: Results from the European Consumer Survey". INDICARE deliverable available at http://www.indicare.org/tiki-download_file.php?fileId=110

[127] Jupiter Research 2005: "15% of European Internet users download illegal music, 5% buy it in legal online stores". Press release 29 November 2005. Still a small proportion compared to 27% of US internet users who admitted downloading music illegally from peer to peer networks in 2005 (PEW/Internet 2005: "PEW Internet project data memo" Available at http://www.pewinternet.org/pdfs/PIP_Filesharing_March05.pdf)

[128] IFPI 2007op. cit. p 33

[129] European Foundation for the Improvement of Living and Working Conditions 2003 op. cit. p. 30

[130] IMCA 2002: "Identification and evaluation of financial flows within the European cinema industry by comparison with the American model". Executive summary of research project for DG EAC available at http://www.bsac.uk.com/reports/achievingdiversity.pdf

According to ScreenDigest (2006) digital on-demand movie generated €30 million revenues in Europe in 2005 (out of which €2 million online), the UK being the largest market in Europe. Digital revenues are expected to reach €1.2 billion by 2010 (€1 billion from online VOD). Online markets alone are expected to reach €1 billion in Europe by 2010 (against €1.5 billion in the US.

The overall filmed entertainment market will expand at a compound annual rate of 4.6% to $44 billion in 2011 as estimated by PWC,[131] a growth explained by the expansion of the box office market thanks to digital cinemas and support of local films, high-definition videos and the emergence of digital streaming services. Online subscription rentals will propel overall rental activity while cannibalizing in-store spending.

In aggregated terms, the global value of Television broadcasting and distribution was, in 2001, of $257,769 Million (25.5% of the global entertainment market) and was forecasted to experience important growth, especially in the area of cable and satellite distribution.

The turnover of the European TV production area was estimated, in 2000 to be €11.200 Million.[132] After heavy losses in the period 2000-2002, caused by the fall in advertising revenues after the dot.com bubble burst, and heavy expenditures on the acquisition of digital licenses, the situation of European TV companies has improved, although they still present an important net deficit (€2.4 billion in 2003). The main producers of TV content in Europe are Germany, UK, France, Italy and Spain.

The European Online TV market (open Internet TV) generated €4 million in 2005 (UK and France being the biggest markets) and is forecasted to reach €689 million in revenues by 2010 (ScreenDigest 2006).

The overall VOD market will expand at a 19.5% compound annual rate to $4.2 billion in 2011 from $1.7 billion in 2006 while the overall pay-per-view market will increase to $3.3 billion in 2011, a 4.4% compound annual advance. The overall premium market (subscription) will total $15.1 billion in 2011 from $11.6 billion in 2006, a 5.3% rise compounded annually.[133]

In 1998, the audiovisual sector (including radio broadcasting) employed 1 million people.[134]

In 2002, Europe presented a deficit of $8.2 Billion in its balance of trade of audiovisual goods with North America. The deficit in the area of acquisition of TV rights (in a context of multiplication of channels) was growing. In respect to film features, independent American film productions were becoming more important at the expense of major studio features. The UK was the only major exporter of feature films to the US (for a value of $691 Million in 2000).[135]

---

[131] PriceWaterhouseCoopers, see footnote 92
[132] Andersen 2002 op. cit. p. 24
[133] PriceWaterhouseCoopers, see footnote 92
[134] Ducatel, K., Burgelman, J.C., Bogdanowicz, M. 2000: "Employment Outlook and occupational change in the media content industries (2000-2005)". Seville: IPTS.
[135] European Audiovisual Observatory 2002a: "The Imbalance of Trade in Films and Television Programmes between North America and Europe Continues to Deteriorate". 9 April 2002. Press release available at http://www.unesco.org/culture/industries/cinema/html_eng/trade.shtml

There has been an increase in the levels of foreign investment in the European audiovisual sector. Between 1995 and 1999, the operating revenue of audiovisual companies owned by foreign investors rose from €5.9 Billion to €12.8 Billion. Of these 264 companies, 239 were controlled by US investors.[136]

Table 3: ICT innovation in the European audiovisual sub-sector

Area	Key Technologies	Impacts	European context
Content Creation			
	Digital cameras, Desktop editing tools and CGI technologies	Lower barriers for content creation and entrance in the markets by new actors	No evidence of their adoption, although it appears likely to be growing, In many cases these tools are pirated.
Content Distribution			
	Films		
	Digital distribution of feature films	Increase the efficiency of film reels distribution channels and the flexibility of theatrical programming	No evidence of its application at this point. A potential channel for reducing bottlenecks in the distribution of European films?
	De-Encryption of DRM and filesharing	Make it possible to download copyrighted content very easily, decreasing box office ticket sales. Fast cracking of DRM technologies	High levels of piracy at the European level.
	Online rental services	Availability of large virtual inventories of goods at competitive prices	Thriving online market, might contribute to improve the low DVD revenues of European films.
	Digital distribution via video on demand services	Create new channels for distribution opening up opportunities for new, in many cases, smaller, actors.	Still at its early stages, expected to experience important rates of growth.

---

[136] Ibid.

Area	Key Technologies	Impacts	European context
	Television		
	Digital Television and IPTV	Growth in the number of available channels and importance of subscription models.	High growth, Europe is the world leader in the provision of triple play services. There are concerns about the levels of concentration in Digital television broadcasting.
User Interaction			
	User generated video sites	Concerns about uploading of copyrighted content. Highly powerful as promotion tools, in some cases signal talented creators	Emergence of country-specific, highly innovative user generated video sites.
	Virtual communities of fans	Carry out promotion and diffusion activities, in some cases engage in creative activities themselves.	Anecdotal evidence of its importance, still less of a phenomenon than in the US.

Table 3, above, presents a brief description of key-technologies, their impacts and some European context highlights which are more in detail discussed below.

b) European features

▪ **Content creation**

- **Financial constraints**: Market fragmentation and small scale hinders European producers' access to funding for production, especially in films. This situation is addressed through several different mechanisms including the use of television and public funding (which, in 2002, amounted to 29% of the aggregated funding for films in 31 European states, and concentrates mostly in the area of production), and co-production.[137]

- **Consolidation of TV production markets**: in 2000, the 5 major European TV producers only accounted for 25% of the market, but the sector is undergoing a process of consolidation driven by economies of scale and scope in content production and distribution.

---

[137] European Audiovisual observatory 2003b: "Public Funding for the Film and Audiovisual Sector in Europe". Presentation at the European Film Funding Conference, London, 20 November 2003. http://www.obs.coe.int/oea_publ/prodfin/filmfunding_londonconf.pdf.en

- **Content distribution**

- **Weakness of distribution channels and market fragmentation**: The European film market is highly fragmented: European films are difficult to export outside their country of origin. This issue is linked to the barriers faced by European content creators when trying to access European-wide distribution networks, owned totally or partly by US majors. US control over commercial structures for distribution make it easier for their films to reach European audiences.[138] The exceptions to this trend are large European productions with blockbuster potential, on many occasions financed by US majors.

- **A nascent online distribution market**: The European digital market for films is still at its nascent stages, and by 2005 it only generated €30 Million in revenues. However, it is expected to experience spectacular growth in the next few years, reaching €1.2 Billion revenues by 2010 (or 7% of the European film market).[139]

- **Reliance on theatres as a source of revenue**: European films rely more heavily on theatre admissions than US (77% of revenue streams versus 34%): in the case of US feature films, 41% of revenues come from DVD sales and 26% from Television (including Pay and Free broadcasts); the respective percentages for European films are of 3% and 19%.[140] As it was the case with film reel distribution, DVD distribution channels are mostly dominated by US majors.[141]

- **A thriving online rental market**: The online rental sector is projected to experience important rates of growth in the middle term. These services are especially developed in the UK (where in 2005 one of each ten DVD rentals where taking place online), Germany and France. These services are growingly incorporating film download services as well.[142]

- **Growth in number of TV channels**: The emergence of cable, satellite and, growingly, digital television, has led to rapid expansion in the number of available television channels in the European Union. The digital area has experienced particular growth, although most thematic channels are financially weak and in a risky situation given their concentration on niche markets.[143]

- **Digital TV platform concentration**: Incompatibility between set-top boxes, economies of scale (e.g. funds necessary to access premium content) and scope (to offer a diverse mix of channels) and processes of media concentration limit competition between digitals platforms at a national level. This issue presents, in

---

[138] Andersen 2002 op. cit. p. 24, European Audiovisual observatory 2003a: "The Fragmented Universe of Film Distribution Companies in Europe". Presentation at the "Distribution of European Films" Workshop, Venice 29-31 August 2003. Available at http://www.obs.coe.int/online_publication/expert/filmdistcompanies.pdf.en . The attempts to address this issue through the creation of a pan-European film distribution network, PolyGram, failed.

[139] Screen Digest et al. 2006 op. cit. p. 34.

[140] IMCA 2002 op. cit. p. 35.

[141] European Audiovisual Observatory op. cit. p 36

[142] Screen Digest 2005: "The outlook for online DVD rental: A strategic analysis of the US and European markets". Press release available at http://www.screendigest.com/reports/05onlinedvdrental/readmore/view.html

[143] Lange,. A. 2005: "The Financial Situation of Television Companies in the European Union (1999-2004)". Strasbourg: European Audiovisual Observatory.

the context of digital switchover from analogous (to be completed by 2012), important implications for competition policy.[144]

- ▪ **User interaction**

- **European advantages in IPTV**: Although digital and High-definition TV (HDTV) penetration rates in Europe still lag behind those in the USA, the continent is leading the adoption of Internet Protocol Television (IPTV) especially in those countries like France or Italy where competition from incumbent cable and satellite providers is weaker. Market forecasts predict 8.7 million subscribers by 2009 (this is, 9.5% of the Pay-TV market).[145] This is linked to the broader provision of video on demand and digital interactive television services through 'four-play' (where a same player provides Television, broadband, mobile and fixed-line telephony), with important repercussions in the advertising and video game areas as well

- **User generated video content**: The predominance of English-language content in user-generated video market leader YouTube has led to the emergence of competitors such as MyVideo and Sevenload in Germany, WAT, VPod and Dailymotion in France or Dalealplay in Spain. These innovative services are currently experimenting with a wide range of strategies for content delivery and usage, 'mash-up' with other applications, and user engagement.[146] The streaming high quality video service JOOST, launched by the founders of Skype, has also been constituted as a European venture.

3.4. The European video game sub-sector

a) Sub-sector overview

The video game industry has experienced spectacular growth since its beginnings in the 1970s; its aggregated value has surpassed film box office sales and it already rivals, in economic importance, the recorded music industry (The Economist 2002).

In its Global 2006 Entertainment and Media Outlook, PwC identifies video games as the fastest growing segment inside the creative sector, expanding at an overall rate of 11.4%, from a turnover of $27 Billion in 2005 to $46 billion in 2010. The launch of next generation video game consoles at the end of 2006, the increasing penetration of handheld devices (including video game enabled mobile phones) and the growth in the popularity of online games (MMORPGS and virtual worlds) are identified as drivers of this expansion. The report forecasts a decline in the sales of PC games, from $771 Million in 2004 to $655 in 2009, continuing a trend already observed after 2000.[147]

---

[144] EC 2004b: "Application of EC Competition Rules to Broadcasting- The Transition from Analogue to Digital". Speech by Herbert Ungerer, Napoli, 20 September 2004. Available at http://ec.europa.eu/comm/competition/speeches/text/sp2004_013_en.pdf, EURO-MEI 2005: "EURO-MEI comments on the European Commission's Issue Papers for the Audiovisual Conference in Liverpool". Available at http://ec.europa.eu/comm/avpolicy/docs/reg/modernisation/issue_papers/contributions/ip1-3-4-6-euromei.pdf

[145] BBC News 2005: "Internet TV 'to boom' in Europe". 22 November 2002.

[146] Hollywood Reporter 2004: "Europe sets its sites on Web video". 19 December 2006. Available at http://www.hollywoodreporter.com/hr/content_display/news/e3i2d2333041a2e651018cd37176d9f787d

[147] OECD 2005a op. cit. p. 26.

The overall video game market is projected by PWC[148] to grow by 8.1% compounded annually to $13.4 billion in 2011 from $9.1 billion in 2006. Consumer spending on games will expand at a 6.7% compound annual rate to $12.5 billion from $9 billion in 2006. Console/handheld games will continue to dominate the market, increasing at a compound annual rate of 4.2% to $7.9 billion in 2011 from $6.5 billion in 2006. Online games will be the fastest-growing end-user segment, increasing by 19.3% on a compound annual basis from $1.1 billion in 2006 to reach $2.7 billion in 2011. Wireless games are expected to grow from $499 million in 2006 to more than $1 billion in 2011, a 15.6% compound annual growth rate. The PC game market will decrease to $840 million in 2011 from $969 million in 2006, a 2.8 compound annual decrease in spending.

The Europe, Middle East and Africa region is the fastest growing region in the world, at a compound annual rate of 19.1%, compared to 18% in Asia and 12.1% in the USA. By 2009, the shares of the 'European' and 'American' regions in the global video game market are estimated to be practically equivalent (27.2% and 28.7% respectively), with the Asian market comprising the rest (44%).

Regarding the uptake trends of different hardware platforms, PWC forecasts increasing importance of wireless and online games in Europe and Japan, while consoles retain their superiority in the USA.[149]

ScreenDigest valued the European digital games market at €699 million in 2005 (50% of it being mobile); the physical retail market was worth €5 billion in 2005 and a 33% growth rate of total games market is forecasted by 2010.

Europe is a key player in the global video game industry, predominantly in the areas of video game development and publishing: Three of the 15 largest video game publishers (Ubisoft, Eidos, and Atari/Infogrames) are based in Europe.[150]

In the absence of quantitative data at a European level, we have reviewed available national reports, with the following findings:

- **United Kingdom:** The UK constitutes the third video game market in the world after the USA and Japan.[151] On 2003, the UK video game industry employed around 22,000 people (6000 of these worked in game development companies), and had a value of EUR 1,719 B (USD 2 Billion). In 2003 it presented a positive balance of trade of almost £200 M, which compares positively with the traditional deficits on both the film and music industry.[152]

- **France:** The French video game industry had, as of 2006, a turnover of EUR 1.2 Billion and is the third largest market in Europe behind the UK and Germany. In 2003 there were 2,600 people employed in video game development companies.[153]

---

[148] PriceWaterhouseCoopers, see footnote 92
[149] PriceWaterhouseCoopers 2004: "Global Entertainment and Media Outlook 2004-2008:Video Games"
[150] OECD 2005a op. cit. p. 26
[151] Ibid.
[152] ELSPA 2005 op. cit. p. 26
[153] DTI 2003: "From exuberant youth to sustainable maturity:
Competitiveness analysis of the UK games software sector- Main report". Available at
http://www.dti.gov.uk/files/file10663.pdf

Table 4, below, presents a brief description of key-technologies, their impacts and some European context highlights which are more in detail discussed below.

Table 4: ICT innovation in the European video game sub-sector

Area	Key Technologies	Impacts	European context
Content Creation			
	Next generation consoles	Growing sizes and technical complexity of video game development in these platforms	Consolidation in the publishing sector and adoption of platform diversification strategies in order to reduce risks.
	PC Platforms	Open access to the PC platform decreases barriers to entry and promotes innovativeness	The PC platform remains important in Europe
Content Distribution			
	Online distribution of video games	Open up new channels for entrance in the market. In the case of video game consoles these platforms are dominated by hardware providers, New channel for distribution of easier to develop video games with alternative value chains dominated by mobile carriers, ISPs and other content aggregators. Growth limited by market fragmentation in mobile Operating Systems.	Important growth expected in both areas
	Mobile gaming		
User Interaction			
	MMORPGs	New business models based on subscriptions and virtual economies, the interactive, social nature of the experience increases user engagement, in some cases facilitated through the provision of content production tools	Growing importance of this market, absence of leading European developers.

b) European features

▪ **Content creation**

- **Survival of the PC platform**: Differently from other countries such as Japan, the PC still video game platform constitutes a significant market in Europe, although it is expected its share of the video game market will decrease in the middle term.[154]

- **Healthy creative fabric**: There is a numerous population of highly creative small development studios, especially in the UK, France, Germany, and the Nordic Area and, to a lesser extent, Spain. Their access

---

[154] DTI ibid, TNS/Sofres 2004: "Le marché français des jeux vidéo auprès des adolescents et des adultes". Results available at http://www.tns-sofres.com/etudes/it/181104_jeuxvideo_n.htm

to the market, particularly in the growingly important area of dedicated video game consoles, is however constrained by the lack of financial resources.

- **Platform diversification**: European video game publishers diversify the risks of their releases through cross-platform publication. The adoption of this approach is limited by the extent of platform technical heterogeneity: For example, Ubisoft's sales growth has been driven by its support for the recently released Nintendo Wii console, for which it has published specifically tailored titles which would be difficult to adapt to competing platforms.[155]

- **Consolidation and vertical integration**: The financial constraints that smaller actors face when trying to spread development costs across platforms, or carry out parallel projects, has led to a process of consolidation in the video game development sector, and to the vertical integration of successful studios by large publishers.[156] The identification of Intellectual Property as the main source of competitive advantage in the industry, to be created through internal development or acquired via the integration of smaller studios reinforces this trend.

- **Strong presence of non-European publishers:** The aforementioned process of vertical integration has also featured non-European publishers, especially in the case of the UK, where obstacles to access to finance have resulted in a weak publishing sector.[157]

- **Delocalisation**: Most large publishers are highly delocalised: 6 out of Ubisoft's 14 studios are outside Europe, while Infogrames/Atari has cut 60% of its French staff as part of its strategy of concentration in the US market.[158]

- **Lack of cultural specificity**: European National markets are perceived as too small for the development of video games adapted to local tastes and cultural identities. This is an additional driver of the delocalisation process mentioned above, as local presence makes it possible to tailor content to specific markets (outside Europe) and manage distribution networks more efficiently.[159] There are interesting exceptions to this pattern, such as for example Pan Vision, a company specialising in the development of video games aimed at the family market in the Nordic Area which has been very successful with its 'Backpacker' series.[160]

[155] Ubisoft 2006: "Continued strong growth in the US market and success of Wii titles in Europe". Ubisoft Press Release 14th December 2006.
[156] ELSPA 2005 op. cit. p. 26, DTI 2003 op. cit. p. 39.
[157] Ibid.
[158] Fries, F. 2003: "Propositions pour développer l'industrie du jeu vidéo en France", Agence Française pour le Jeu Vidéo.
[159] Infogrames Entertainment 2005: "Annual Report 2005". Available at http://corporate.infogrames.com/uk/download/reports/DOCDEREF31MARS05COMPOUK.pdf
[160] See http://www.panvision.com/

- **Content distribution**

  - **Growth in Mobile gaming and online distribution:** in 2005 the European digital video game distribution market was of €698 million (48% of which was based on mobile gaming). By 2010 it is expected to grow to €2.3 Billion, or 33% of the total game market. Most large publishers have already established divisions that focus specifically in the mobile area, and some of them, such as Eidos, have started providing online download services.[161]

- **User interaction**

  - **MMORPGs and online gaming:** language barriers and relatively expensive broadband access (which constrain demand) limit the development of MMORPGSs targeted at the European market. However, the market is expected to expand spectacularly in the short term, and this has attracted foreign MMORPG developers, who have started establishing subsidiaries in Europe. The main European company in this area is Norwegian developer/publisher Funcom.

3.5. The European cultural spaces sub-sector

a) Sub-sector overview

Most statistics on the Cultural Spaces sector have started being compiled recently and are presented in disaggregated terms (separately for museums and statistics), primarily at the national or local level.[162] According to Fuegi and Jennings, the European library sub-sector employed 336.000 people in the Enlarged EU 2001, and 29% of the population of the Enlarged European Union was registered at one.[163]

b) European features

- **General**

  - **European initiatives**: The European Union has launched initiatives to promote and co-ordinate the systematic collection and digitisation of the European Film Heritage, and its open access for non-commercial purposes, and more generally, the creation of a European Digital Library that, by 2010 is targeted to include museums and private initiatives and contain at least 6 Million digital objects.[164]

---

[161] ACTeN 2004 op. cit. p. 27.

[162] EGMUS 2004: "A Guide to European Museum Statistics". Report available at http://www.smb.spk-berlin.de/ifm/dokumente/materialien/IfM_001-202_WEB.pdf

[163] Fuegi, D. and Jennings, M. 2004: "International library statistics: trends and commentary based on the Libecon data". Library services statistics in Europe and beyond– LIBECON Report available at http://www.libecon.org/pdf/InternationalLibraryStatistic.pdf

[164] EC (2006): "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Digitisation and Online Accessibility of Cultural Material and Digital Preservation" Brussels: European Commission, Foster, H. (2006): "Building the European Digital Library- The European Commission's role, ambitions and actions". Transcript of a Speech given at Paris, 7 December 2006 Available at http://europa.eu.int/information_society/activities/digital_libraries/doc/speech/hf-speech-bnf_7_12_2006.pdf

- **Content creation**

    - **Content management system implementation:** The availability of customisable easy to use Open Source Content Management Systems has increased their attractiveness for Cultural Spaces.[165]

    - **Diversity of standards for indexing and classification systems:** Although there have been growing efforts towards the co-ordination of standard setting processes for indexing, classification and metadata in certain countries such as Norway or the UK, there is still fragmentation at the European level.[166] This issue is to be addresses through the launch of the European interoperability framework.

- **Content distribution**

    - **Growing importance being attached to initiatives in the area of ICT implementation when determining funding priorities in libraries**: A growing proportion of public library budgets are being spent on ICT resources. The effect of this trend appears to be particularly strong in Ireland, Belgium, Denmark, Sweden and the UK.[167]

    - **Growing availability of Open Access Journals**: The European area has experienced rapid growth in the quantity of publicly available Open Access Journals, in a number of cases organised as part of institutional or disciplinary collections. This trend appears to be particularly strong in France.[168]

    - **Lack of online access to databases and virtual exhibitions**: The progress towards online availability of internal databases with information about museum and library collections is being slow and fragmentary, although it has taken place with success in a number of larger institutions. The situation is similar in the area of virtual exhibitions.[169]

- **User interaction**

    - **Multimedia access to digital content still at a development stage**: A survey of national initiatives in the area showed that, by 2004, tools for multimedia access to digital content and interactive services were mostly available as prototypes at a local level, except in the case of Denmark, pervasive access to digital services was provided at a national level.[170]

Table 5, below, presents a brief description of key-technologies, their impacts and some European context highlights which have been more in detail discussed above.

[165] Davies, R. (2005): "State of the art report on national and local policies". Calimera project deliverable 4.
[166] Davies, R. (2004): "Monitoring PULMAN's Oeiras Manifesto Action Plan". MDR Partners report available at REF
[167] ibid.
[168] Comba, V. 2004: "Trends in digital libraries and scholarly communication among European Academic Research Libraries" California Digital Libraries Discussion Group Report Available at http://eprints.rclis.org/archive/00000758/01/irvineprev.pdf
[169] Davies 2005 op. cit. p. 42
[170] Davies 2004 op. cit. p. 42.

Table 5: ICT innovation in the European cultural spaces sub-sector

Area	Key Technologies	Impacts	European context
Content Creation (aggregation)			
	Open source Content management software tools	Increase in the efficiency of archive and classification tasks	Growing funding of ICT technologies, and implementation of Content Management Systems.
Content Distribution			
	Digital distribution and online access to OPAC systems	Make it possible to access collections online, increasing the range of the activities of cultural spaces and raising issues regarding parallel access to copyrighted content goods. Important market for eBooks.	Lack of access to online databases and catalogues.
	Standards for content storage	Creation of standards for data storage and transmission creates the possibility of building inter-institutional resources and reduces risks in the preservation of cultural heritage	Diversity of standards and classification techniques, to be addressed at an European level through an interoperability program
User Interaction			
	Open content	Creation of open collections of resources that can be appropriated, manipulated and modified by users enhancing their creative potential	Growing availability of open access journals, BBC digital collection an important innovation in the area.
	Virtualisation and tele-presence	Enhance the immersiveness of the digital experience. Increase the possibilities for the diffusion of artistic content, in many cases with participation from the public.	Fragmentary implementation of innovative interactive technologies in a number of leading museums.

4. CONCLUSIONS

In this concluding section we synthesise the findings of our survey of the situation of the European Creative Content sub-sectors selected for the purposes of our Discussion Papers, identify some of the areas of policy concern arising from our discussion, and identify several questions for which the opinions of a panel of experts might productively address (see Annex). It is clear that in spite of the presence of idiosyncratic factors at a national and sub-sector level, there are two emergent themes linked to content digitisation that cut across these boundaries, they are content diversity and convergence:

By diversity we refer to the enhanced possibilities that ICT infrastructures create for the distribution and consumption of a wider range of creative content goods, in physical and (growingly) digital form (reflected in what Chris Anderson has defined as 'the long tail').[171] Convergence concerns the trend towards seamless access to different kinds of content in hardware devices: digital content becomes multi-platform, and technological platforms become, simultaneously, multi-purpose.[172]

These systemic trends are a consequence of the reproducibility, index-ability and malleability of digital content goods, and are causing a fundamental shift in the nature of the activities of those actors engaged in their creation, distribution and consumption, and the structures through which they interact.

The direction of this impact is not, however, predetermined: as we have shown in the previous discussion. The nature of digital goods allows for a diversity of configurations in terms of industrial structure, business models and balance of power between participants. For example, digital content is easily reproduced and transmitted, but it is also controllable through technological measures such as Digital Rights Management tools. This flexibility of deployment results in tensions between actors with different goals and values, some of which have been sketched in the previous pages. The trends towards greater variety in access and convergence in use are clearly established, but essential questions regarding their specific manifestation, for example, in terms of the channels and conditions for access to the wealth of available content, are still open. Those players able to address these questions faster and more convincingly should reap important benefits, not only in terms of immediate revenue or financial gain, but perhaps also in other currencies such as a larger audience, enhanced creative potential, a broader choice of creative content goods, sustainable business models or the survival of traditional forms of expression. As we have mentioned, this sector is a crucible of different motivations and goals, in some cases complementary, in others conflicting.

In Discussion Papers 2 and 3 we shall respectively analyse technological trends in the areas of content creation, distribution and interaction, and market demand and political and institutional factors with the goal of presenting future scenarios for the creative content sub-sectors that have been selected for analysis and which are an

---

[171] Anderson, C. 2004: "The Long Tail". Wired, October 2004. Available at
http://web.archive.org/web/20041127085645/http://www.wired.com/wired/archive/12.10/tail.html
[172] Apple's latest generation of iPods, and the recently announced iPhone, exemplify these trends.

outcome of the interaction of the technological, social and economic forces that we have identified in the previous discussion. Our analysis will focus on the nature of industrial configurations for content creation, distribution and user interaction, characterised in terms of the focal element around which the creative, commercial and innovative activities of the players inside each sub-sector are organised; they can be hardware platforms (such is the case of the iPod and the video game console market), delivery platforms (digital TV), content rights (feature films and the PC game market), user groups (peer-to-peer networks and user-generated virtual worlds) or content creators (in the eBook market). This approach should provide a strong foundation for elaborating future scenarios that take into account those European specific features identified in section 3, generally linked to a fragmentation of markets along linguistic and cultural lines which, when considered from the point of view of scale, seem to place the European Creative Content Industries in a position of weakness, especially compared to other financially mighty and far-reaching mass media and entertainment players. It is important to bear in mind, however, that this fragmentation is also a source of diversity, experimentation and innovation, values in themselves, and potential sources of competitive advantage in the context of growingly seamless networks that make it possible, in principle, for any talented actor to reach a global audience. Nonetheless, there are a number of complementary and reinforcing actions that may be considered as ways to enhance the value and impact of diversity on market outcomes. These will be considered in Discussion Paper 2 where we dwell on, in some detail issues related to the 'construction' of audiences for content. Focussing on the opportunities and threats to the realisation of the communication potential of ICT networks within the context of the sub-sectors we are analysing, and taking into account the richness of Europe's creative fabric; which is one of the tasks we undertake in Discussion Paper 2.

One issue that has emerged as part of our discussion is that of the blurring boundaries between actors with clearly defined roles and functions, as, for example, readers become authors, music listeners become distributors and promoters, and publishers turn themselves into content creators. This trend, linked to the wider availability of easy to use tools for content creation and enhanced technological capabilities for transmission of digital content, helps create a dynamic scenario for sustained interactions between different players according to a model growingly resembling that of the services industry. It also creates fuzzy areas where innovations with a potentially broader reach appear to be taking place at an accelerated rate, an issue that seems to deserve the attention of adventurous commercial actors and policy makers.

Summary of areas for policy concern in the European context

a) The books sub-sector

Policy concern in this sector involves finding ways to mitigate the effect of market fragmentation in both production and distribution. On the one hand, this fragmentation suggests relatively liberal competition policies since relative global market position is often the standard used to assess the emergence of dominant market competition. On the other hand, however, the creation of dominant competitors within particular linguistically defined markets may reduce diversity and the opportunities for creative innovation. It is therefore important to take account of the unusual features of this market compared to markets with more homogeneous and internationally traded outputs.

Specifically in the area of e-books, a long awaited new market development, the promulgation of effective standards with regard to DRM (digital rights management) that provide users with many, and perhaps all, of the features available to the purchasers of printed paper copies of books. Policies favouring the consolidation and simplification of DRM will hasten the deployment of e-publishing and provide important new market opportunities for European producers. As in other areas related to intellectual property rights, the creation of a spectrum of technological and legal alternatives for asserting rights offers the greatest potential for the creation of healthy business diversity and competition as well as the interests of other stakeholders including readers.

b) The music sub-sector

This sector continues to face a crisis related to the sustained practice of strong intellectual property rights which has heightened conflicts between music publishers and their customers. While some amelioration of these conflicts have occurred due to new services such as iTunes, this same process seems to have foreclosed or at least greatly constrained competition from other potential entrants to music distribution. Continuing to assess and seriously evaluate the social welfare consequences of intellectual property protection in this sector is an important priority. Alternatives involving the accumulation of 'licensing funds' and their allocation to those affected by copyright infringement is one of several alternatives whose social welfare consequences should be assessed. Failing to achieve a more fundamental reform, consideration of policies that diversify the models by which intellectual property rights may be defined, defended, and used as a basis for sustainable business models should be considered in order to give smaller publishers and distributors new business and creative opportunities.

c) The audiovisual sub-sector

This sector continues to be affected by the problems of achieving effective competition when, in many Member States, high concentration exists in many of the distribution channels for creative content. Such concentration influences welfare by providing incentives to build 'mass' audiences in order to offer advertisers better value for their support of content or to strengthen distributors that are under pressure from alternative distribution channels. Careful analysis of the sustainability of alternative distribution channels for audiovisual content that better support diversity and variety and thereby open new business and cultural expression opportunities is urgently needed. In some countries, public broadcasting may have the effect of over-centralising initiatives in content creation or monopolising the attention of the supporting industries such as independent production companies and technical services. Effective policies in this are likely to be very difficult to achieve due to the pressure that traditional audiovisual producers face from alternative distribution channels (including the Internet) and the strength of media producers in countries with populations more willing to support particular 'styles' of mass production including Hollywood and Bollywood.

d) The video games sub-sector

Europe continues to have a viable and expanding video games industry that is seeking new channels for the distribution of its creative content production. Achieving greater

inter-operability between different mobile platforms to support mobile channels for content distribution is of some urgency. On the one hand, mobile network operators wish to serve as their customers' agents in delivering the best 'user experience' for their services. On the other hand, the capacity of these operators to assess innovations and evolving customer demands may be limited. Achieving a balance that allows a greater range of innovative initiative by games producers appears, on balance, to offer all stakeholders with important gains. It is unlikely however, that inter-operability between mobile platforms will be achieved through ordinary processes of market competition.

e) The cultural spaces sub-sector

The cultural spaces sub-sector offers a particular rich set of opportunities for the development of highly innovative and novel product and services that can have broader implications for other creative content industries. Although there have been significant investments in the basic science and technology relevant to this sector, the rapid evolution of technology including the Internet suggests that the science and technology knowledge base supporting stakeholders in this area may require further investments. In addition, there are important issues to be resolved about how benefits may be shared between the collective ownership of many cultural spaces and private actors who will be devising new means of building value in these spaces (e.g. the creation of audio tours to our urban and cultural spaces enabled by the marriage of network and GPS technologies.)

Acronyms / Glossary

Acronym/ Term	Description
DRM	Digital Rights Management
HDTV	High Density Television
ICT	Information and Communication Technologies
IPR	Intellectual Property Rights
IPTV	Internet Protocol Television
MMORPG	Massive Multi-player Online Role Playing Game
OPAC	Online Public Access Catalogue

ANNEXES

Questions that might be addressed by a panel of experts

1. What are the principle issues impeding the uptake of e-books (e.g. quality of 'player' devices, absence of appropriate standards representing content, issues related to DRM)?

2. What, if any, policies might slow the decline of independent book sellers (offering both new and used titles) in order to preserve their role in promoting variety. Correspondingly, do independent book-sellers offer a meaningful source of variety given the emergence of both mass and specialised sources of Internet information on books?

3. Is the view that illicit digital copying of music has been 'contained' and is likely therefore to decline in coming years valid?

4. Would a system of collecting royalties on online distribution of music be preferable to efforts to curtail this practice by pursuing those practicing it? If so, would such a scheme be feasible and how might it be funded?

5. Are mobile phone platforms likely to be able to compete robustly with dedicated portable music players? If so, what is the relative importance of a) expanding their storage capacity, b) enhancing services for selecting music online, and c) creating more effective means of linking mobile phones to personal computers?

6. Would a system of collecting royalties on online distribution of audiovisual content be preferable to efforts to curtail this practice by pursuing those practicing it? If so, would such a scheme be feasible and how might it be funded?

7. Are Internet modes of distribution of audiovisual content (including illicit copying) likely to provide a serious challenge to video on demand offered by cable and satellite network operators?

8. Would online distribution of films substantially (i.e. sufficient to enhance the sustainability and vitality of producers and publishers) enhance the market for those European films that are not at present entering international distribution channels?

9. Will the use of social channels substantially (i.e. sufficient to enhance the sustainability and vitality of producers and publishers) enhance the market for those European films that are not at present entering international distribution channels?

10. Are there infrastructure capacity issues, aside from the extension of conventional ADSL broadband, which should be investigated to support the growth of a European online game industry?

11. What barriers exist to the uptake of MMORPGs (massively multiple online role playing games) in a European context?

12. Would improving the inter-operability of the gaming capacities of mobile telephone handsets substantially (i.e. sufficient to enhance the sustainability and vitality of producers and publishers) influence market growth for mobile game producers and publishers?

13. Have the many efforts to achieve greater standardisation in OPAC systems significantly extended access to these resources? If not, what actions might be taken to improve access?

14. Is there a realistic prospect for a European-wide standard for content storage? Failing that, is there a realistic prospect for European-wide standards for classification techniques? Would public research funding aid in this process?

15. Is Europe lagging behind or in advance of the US in the creation of online access to museums and libraries? What areas should be seen as high priority for further action?

16. Would public research funding assist in improving the experience of making 'virtual visits' to museums and other cultural resources (i.e. is there a realistic prospect that research will be translated into use)?

REFERENCES

- **ACTeN 2004**: "Mobile Games E-Content Report 3". Available at http://www.acten.net/uploads/images/382/IR3_010304-2.pdf

- **Albini, S.** 1993: "The Problem with music". Originally published in The Baffler Vol. 4, available at: http://negativland.com/albini.html

- **Andersen 2002**: "Outlook of the development of technologies and markets for the European Audio-visual sector up to 2010". Available at http://ec.europa.eu/comm/avpolicy/docs/library/studies/finalised/tvoutlook/tvoutlook_finalreport_short.pdf.

- **Anderson, C.** 2004: "The Long Tail". Wired, October 2004. Available at http://web.archive.org/web/20041127085645/http://www.wired.com/wired/archive/12.10/tail.html

- **Baumol, William J.** 1982: "Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, American Economic Association, vol. 72(1), pages 1-15, March.

- **BBC News 2005:** "Internet TV 'to boom' in Europe". 22 November 2002.

- **BBC News 2007**: "Unsigned band set to crash charts". 10 January 2007. Available at http://news.bbc.co.uk/2/hi/entertainment/6248535.stm.

- **Besser, H.** 2002: "The Next Stage: Moving from isolated digital collections to interoperable digital libraries". First Monday, 7 (1). Available at http://www.firstmonday.org/issues/issue7_6/besser/#author

- **Brown, A.** 1999: "Economics, Public Service Broadcasting and Social Values". Journal of Media Economics, 9 (1) pp. 3-15.

- **Brynjolfsson, E., Smith, M. and Hu, Y.** 2003: "Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers". Cambridge, Mass: Centre for e-Business @ MIT. Available at http://ebusiness.mit.edu/research/papers/176_ErikB_OnlineBooksellers2.pdf

- **Canoy, M., Van Ours, J., Van der Ploeg, F.** 2005: "The Economics of Books". CESIFO Working Paper No. 1414.

- **Castranova, R.** 2003: "On Virtual Economies". Game Studies. Vol. 3 Issue 2. (Dec). Available at http://www.gamestudies.org/0302/castronova/#top

- **Caves, R.** 2002: "Creative industries: contracts between art and commerce". Cambridge, Mass.: Harvard University Press

- **Chan-Olmsted, S. and Chang, B.** 2003: "Diversification Strategy of Global Media Conglomerates: Examining its Patterns and Determinants". Journal of Media Economics 16 (4), pp. 213-233.

- **Chellappa and Shivendu** 2003: "Economics of technology standards: implications for offline movie piracy in a global context". Proceedings of the 36th Annual Hawaii International Conference on System Sciences, 2003.

- **Comba, V.** 2004: "Trends in digital libraries and scholarly communication among European Academic Research Libraries" California Digital Libraries Discussion Group Report. Available at http://eprints.rclis.org/archive/00000758/01/irvineprev.pdf

- **Davies, R.** 2004: "Monitoring PULMAN's Oeiras Manifesto Action Plan".

- **Davies, R.** 2005: "State of the art report on national and local policies". Calimera project deliverable 4.

- **DTI 2003**: "From exuberant youth to sustainable maturity: Competitiveness analysis of the UK games software sector- Main report". Available at http://www.dti.gov.uk/files/file10663.pdf

- **Ducatel, K., Burgelman, J.C., Bogdanowicz, M. 2000**: "Employment Outlook and occupational change in the media content industries (2000-2005)". Seville: IPTS.

- **Dufft, N., Stiehler, A., Vogeley, D., Wichmann, T.** 2005:"Digital Music Usage and DRM: Results from the European Consumer Survey". INDICARE deliverable available at http://www.indicare.org/tiki-download_file.php?fileId=110

- **EC 2002a**: "Commission Staff Working Paper- Digital Rights Management: Background, Systems, Assessment". Brussels: European Commission.

- **EC 2002b**: "The DigiCULT Report- Technological landscapes for tomorrow's cultural economy: Unlocking the value of cultural heritage". Brussels: European Commission.

- **EC 2003**: "The EU Publishing industry: An assessment of competitiveness". Luxembourg: Office for Official Publications of the European Communities.

- **EC 2004a:** "Publishing Market Watch Final Report". Brussels: European Commission.

- **EC 2004a:** "Publishing Market Watch Final Report". Brussels: European Commission.

- **EC 2004b:** "Application of EC Competition Rules to Broadcasting- The Transition from Analogue to Digital". Speech by Herbert Ungerer, Napoli, 20 September 2004. Available at http://ec.europa.eu/comm/competition/speeches/text/sp2004_013_en.pdf

- **EC 2005a**: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- Key Issues and Case Studies". Brussels: European Commission

- **EC 2005b:** "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- ICT adoption and e-business activity in 2005". Brussels: European Commission.

- **EC 2005c**: "Strengthening the Competitiveness of the EU Publishing Sector" Brussels: European Commission. Available at http://europa.eu.int/information_society/media_taskforce/doc/prerelease.pdf

- **EC 2006**: "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Digitisation and Online Accessibility of Cultural Material and Digital Preservation" Brussels: European Commission

- **EGMUS 2004**: "A Guide to European Museum Statistics". Report available at http://www.smb.spk-berlin.de/ifm/dokumente/materialien/IfM_001-202_WEB.pdf

- **ELSPA 2005**: "THE GAMES INDUSTRY: A UK SUCCESS STORY- Call to Government for more support for one of the UK's most successful industries". ELSPA Press Release available at http://www.screendigest.com/reports/eig05/EBAN-6ALLKS/pressRelease.pdf

- **EURO-MEI 2005**: "EURO-MEI comments on the European Commission's Issue Papers for the Audiovisual Conference in Liverpool". Available at http://ec.europa.eu/comm/avpolicy/docs/reg/modernisation/issue_papers/contributions/ip1-3-4-6-euromei.pdf

- **European Audiovisual Observatory 2002a**: "The Imbalance of Trade in Films and Television Programmes between North America and Europe Continues to Deteriorate". 9 April 2002. Press release available at http://www.unesco.org/culture/industries/cinema/html_eng/trade.shtml

- **European Audiovisual observatory 2003a**: "The Fragmented Universe of Film Distribution Companies in Europe". Presentation at the "Distribution of European Films" Workshop, Venice 29-31 August 2003. Available at http://www.obs.coe.int/online_publication/expert/filmdistcompanies.pdf.en

- **European Audiovisual observatory 2003b**: "Public Funding for the Film and Audiovisual Sector in Europe". Presentation at the European Film Funding Conference, London, 20 November 2003. http://www.obs.coe.int/oea_publ/prodfin/filmfunding_londonconf.pdf.en

- **European Foundation for the Improvement of Living and Working Conditions 2003**: "The Future of Publishing and Media". Dublin: EFILWC

- **Evans, D., Hagiu, A. and Schmalensee, R.** 2005: "A Survey of the Economic Role of Software Platforms in Computer-based Industries". CESifo Economic Studies, Vol. 51, 2-3/2005.

- **Forrester Research 2006**: "Profiling European Bloggers". Press release available at http://www.forrester.com/Research/Document/Excerpt/0,7211,40515,00.html

- **Foster, H.** 2006: "Building the European Digital Library- The European Commission's role, ambitions and actions". Transcript of a Speech given at Paris, 7 December 2006 Available at http://europa.eu.int/information_society/activities/digital_libraries/doc/speech/hf-speech-bnf_7_12_2006.pdf

- **Frey, B. and Meier, S.** 2003: "The Economics of Museums". Zurich: Institution for Empirical Research on Economics Working Paper Series.

- **Fries, F.** 2003: "Propositions pour développer l'industrie du jeu vidéo en France", Agence Française pour le Jeu Vidéo.

- **Fuegi, D. and Jennings, M.** 2004: "International library statistics: trends and commentary based on the Libecon data". Library services statistics in Europe and beyond– LIBECON Report available at http://www.libecon.org/pdf/InternationalLibraryStatistic.pdf

- **Gander, J. and Rieple, A.** 2004: "How Relevant is Transaction Cost Economics to inter-Firm Relationships in the Music Industry?" Journal of Cultural Economics 28, pp 57-59.

- **Garrod, P. and Weller, J.** 2005: "Ebooks in UK Public Libraries: where we are now and the way ahead". Report for the British Council available at http://www.ukoln.ac.uk/public/nsptg/e-books/

- **Geer, D.** 2006: "Digital Music Faces Incompatible Formats". Computer, Vol. 39 No. 4.

- **Greenstein, S. and Devereux, M.** 2005: "The Crisis at Encyclopædia Britannica". Kellogg School of Management, Northwestern University Case Study available at http://www.kellogg.northwestern.edu/faculty/greenstein/images/htm/Research/Cases/EncyclopaediaBritannica.pdf

- **Gurwin, D.** 2004: "Video Game Convergences Pt. II- The Economics of the Gaming Industry". Available at http://www.etc.cmu.edu/about/press_articles/15.html.

- **Hollywood Reporter 2004:** "Europe sets its sites on Web video". 19 December 2006. Available at http://www.hollywoodreporter.com/hr/content_display/news/e3i2d2333041a2e651018cd37176d9f787d

- **Hughes, J** 2002: "Technology and the Degradation of the Musical Aesthetic Experience: Observations on the Historical Correlation Between the Increasing Technology and Declining Quality of Musical Recordings". Zicklin School of Business Working Paper series.

- **Hyatt, S. 2002**: "Judging a Book by its Cover: e-Books, Digitization and Print on Demand". In Gorman (2002): The Digital Factor in Information and Library Services: International Yearbook of Library and Information Management 2002-2003". London: Facet Publishing

- **i2010 High Level Working Group 2006**: "The Challenges of Convergence". DG INFSO Working Paper.

- **IFPI (ibid), Guardian 2007**: "Independent's Day". 12 January 2007. Available at http://music.guardian.co.uk/rock/story/0,,1988019,00.html

- **IMCA 2002**: "Identification and evaluation of financial flows within the European cinema industry by comparison with the American model". Executive summary of research project for DG EAC available at http://www.bsac.uk.com/reports/achievingdiversity.pdf

- **Infogrames Entertainment 2005**: "Annual Report 2005". Available at http://corporate.infogrames.com/uk/download/reports/DOCDEREF31MARS05COMPOUK.pdf

- **Journalism.co.uk 2005**: "Interview with Guillaume Champeau, UK executive for AgoraVox". 7 December 2005. Available at http://www.journalism.co.uk/profiles/story1629.shtml

- **Jupiter Research 2005**: "15% of European Internet users download illegal music, 5% buy it in legal online stores". Press release 29 November 2005.

- **KEA 2003**: "Profile of the European Music Sector". Available at http://www.impalasite.org/docum/04-press/press_0302_1.pdf

- **KEA European Affairs** 2006: "The economy of culture in Europe". Study prepared for the European Commission (Directorate-General for Education and Culture) and available at http://ec.europa.eu/culture/eac/sources_info/studies/economy_en.html

- **Kovac, M.** 2004: "Patterns and Trends in European Book Production and Consumption: Some initial observations". The Public, Vol. 11 (4) pp. 21-36.

- **Lange,. A. 2005:** "The Financial Situation of Television Companies in the European Union (1999-2004)". Strasbourg: European Audiovisual Observatory.

- **Leibowitz, S. 2005:** "Pitfalls in Measuring the Impact of File -sharing on the Sound Recording Market". CESifo Economic Studies, Vol. 51, 2-3/2005, 439–477

- **Level 80 2007**: "Advertising Industry Changes Course". 18 January 2007. Available at http://www.level80.co.uk/advertising_industry_changes_course_video_games_vs_movies.htm).

- **Machlup, F.** 1980: "Knowledge: Its Creation, Distribution and Economic Significance, Volume 1: Knowledge and Knowledge Production", Princeton, NJ: Princeton University Press.

- **Marcus, C.** 2005: "Future of Creative Industries: Implications for Research Policy". Brussels: European Commission.

- **Meisel, J. and Sullivan, T**. 2000: "The Impact of the Internet on the Law and Economics of the Music Industry." Journal of Policy, Regulation and Strategy for Telecommunications. v. 4 no. 2 p. 16-2

- **Miyamoto, D., Whittaker, H.** 2005: "The Book Publishing Industry in Japan and the UK: Corporate Philosophy/Objectives, Behaviour and Market Structure". Cambridge: University of Cambridge ESRC Centre for Business Research Working Paper series.

- **Morrell, S.** 2006: "Book Publicity in the Internet Era Promoting David Morrell's Creepers". Public Library Quarterly 24 (2).

- **MusicTank 2006**: "Beyond the Soundbytes: The Music Tank Report". London: Musik Tank.

- **National Music Council 2002**: "Counting the Notes- The economic contribution of the UK music business". Report available at http://www.musiced.org.uk/features/counting_the_notes.pdf

- **New York Times 2004**: "Box Office in a Box". November 14, 2004.

- **New York Times 2005**: "Once it Was Direct to Video, Now it's Direct to the Web". Oct 23, 2005.

- **Nguyen-Khac, T.** 2003: "The Music Industry in a Dilemma: How New Technologies Can Turn an Industry Upside Down". Presented at the ITS Conference in Helsinki, August 2003.

- **Nielsen Buzzmetrics 2006**: "Consumer Generated Media 101: Word-of-Mouth in the Age of the Web-Fortified Consumer". New York: Nielsen Buzzmetrics.

- **O'Kane, J.** 2004: "The Tide is High But They're Holding On: Are Traditional Music Retailers in the UK All Washed Up?". Report for Music Tank Sound Business Ideas available at:http://www.musictank.co.uk/retail.htm

- **OECD 2005a**: "Working Party on the Information Economy Digital Broadband Content: The online computer and video game industry". Available at http://www.oecd.org/dataoecd/19/5/34884414.pdf

- **OECD 2005b**: "Working Party on the Information Economy Digital Broadband Content: Music"

- **OECD 2005c**: "Working Party on the Information Economy Digital Broadband Content: Scientific Publishing".

- **PA/BA Book Industry Supply Chain Steering Committee 2000**: "Returns: the New Process. A Code of Practice". London: Book Industry Communication.

- **PC Pro 2007**: "French and German consumer groups join campaign to open iTunes". 23 January 2007. Available at http://www.pcpro.co.uk/news/102738/french-and-german-consumer-groups-join-campaign-to-open-itunes.html

- **Peitz, M. and Waelbroeck, M.** 2004: "An Economist's Guide to Digital Music". CESIFO Working Paper No. 1333.

- **PEW/Internet 2005:** "PEW Internet project data memo" Available at http://www.pewinternet.org/pdfs/PIP_Filesharing_March05.pdf

- **Porter, M.** 1985: "Competitive Advantage: Creating and Sustaining Superior Performance". New York: Free Press.

- **PriceWaterhouseCoopers 2004, 2006, 2007**: "Global Entertainment and Media Outlook"

- **Quah, D.** 2003**:** Digital goods and the New Economy. New Economy Handbook. D. Jones. San Diego CA, Academic Press**:** 289-321. Working paper at http://econ.lse.ac.uk/staff/dquah/dp-0212hbne.html

- **Rosenblatt, B.** 2006: "2006 Year in Review: DRM Technologies". Available at http://www.drmwatch.com/drmtech/article.php/3650401/.

- **Scheifeldt, T.** 2006: "Museums at Metaverse". Article published at Found History and available at http://www.foundhistory.org/2006/10/03/museums-in-the-metaverse/

- **Scott, A.** 2002: "A New Map of Hollywood: The Production and Distribution of American Motion Pictures". Regional Studies, Vol. 36 (9). Pp. 957-992.

- **Screen Digest 2005:** "The outlook for online DVD rental: A strategic analysis of the US and European markets". Press release available at http://www.screendigest.com/reports/05onlinedvdrental/readmore/view.html

- **Screen Digest, Goldmedia, Rightscom and CMS Hasche Sigle 2006**: 'Interactive Content and Convergence- Implications for the European Society'. Brussels: European Commission

- **ScreenDigest 2006:** "Interactive Content and Convergence: Implications for the Information Society"

- **Shapiro, C. and Varian, H.** 1998: "Information rules: a strategic guide to the network economy". Boston, Mass.: Harvard Business School Press.

- **Shefrin, E.** 2004: "Lord of the Rings, Star Wars, and participatory fandom: mapping new congruencies between the internet and media entertainment culture". Volume 21, Number 3. Pp. 261-288.

- **Telephia , IFPI 2007**: "Digital Music Report". Available at http://www.ifpi.org/content/library/digital-music-report-2007.pdf

- **Telephia 2005**: "European mobile consumers use music phones to listen to music four times more than Americans". October 17 2005. Press release available at http://www.telephia.com/documents/DeviceReleaseFINAL101705.pdf

- **TENIA Consortium 2002**: "The emergence of New Industrial Activities: Fusing Services and Manufacture (Conceptual Framework)".

- **The Age 2005**: "Will internet video kill the television star?" Available at http://www.theage.com.au/news/technology/will-internet-video-kill-the-television-star/2005/10/08/1128563033411.html

- **Throsby, D**. 2001: "Economics and Culture". Cambridge: Cambridge University Press.

- **TNS/Sofres 2004**: "Le marché français des jeux vidéo auprès des adolescents et des adultes". Results available at http://www.tns-ofres.com/etudes/it/181104_jeuxvideo_n.htm

- **Ubisoft 2006**: "Continued strong growth in the US market and success of Wii titles in Europe". Ubisoft Press Release 14th December 2006.

- **Vaknin, S.** 2005: "The Future of Electronic Publishing". Article available at http://samvak.tripod.com/busiweb24.html

- **Wired 2004:** "BBC to Open Content Floodgates". June 16, 2004.

- **Wired 2005**: "Hollywood Plots End of Film Reels". July 28, 2005. Available at http://www.wired.com/news/digiwood/0,1412,68332,00.html

- **Wired 2007:** "Will Digital Radio Boom in U.S.?". 18th January 2007. Available at http://www.wired.com/news/technology/0,72514-0.html?tw=wn_index_3

- **Wolfe, Richard** 1995: "Recording Artist's Royalties." Entertainment Law & Finance. no. 6 (1994).

- **Zhu, K.** 2001: "Internet-Based distribution of Digital Videos: The Economic Impacts of Digitization on the Motion Picture Industry". Electronic Markets Volume 11 (4). Pp 273-280

Discussion Paper 2:
Technology Trends
in the Creative Content Sector

EPIS Work Package 2 – Deliverable 2.2

**Administrative Arrangement
30-CE- 0070769/00-29**

The following EPIS project partners and ETEPS* members are the authors of this report:

Juan Mateos-Garcia   SPRU - Science and Technology Policy Research   UK
Aldo Geuna   SPRU - Science and Technology Policy Research   UK
W. Edward Steinmueller   SPRU - Science and Technology Policy Research   UK

The following IPTS EPIS Team members have contributed to and edited this report:

Ioannis Maghiros   IPTS, Senior Scientific Officer
Fabienne Abadie   IPTS, Scientific Officer
Corina Pascu   IPTS, Scientific Officer

This is the second discussion paper of a series of three which describe the present status and future trends in the Creative Content sector with the aim to help identify appropriate strategies to enhance the growth of the sector in the future.

EXECUTIVE SUMMARY

In this Discussion Paper, we examine the impact of innovative trends in the ICT area on the European Creative Content Sector, paying special attention to the Books, Music, Audiovisual (film and Television), Video Games and Cultural Spaces sub-sectors.

We begin our analysis by highlighting some essential features of ICT innovation which influence the shape and loci of technology development processes, and the characteristics of their outcomes. We argue that the abundance of hardware and bandwidth, the end-to-end nature of dominant telecommunication networks and the growing digital literacy of the user population have led to distributed processes of innovation, in many cases undertaken by users themselves. Successful outcomes are often reinforced by the 'winner-takes-all' dynamics that characterise networked platforms. One consequence of this process has been the development of a wide array of innovative tools that facilitate the creation and publication of content, and its access using online media, which has led to the observation of 'the long tail phenomenon' – the continued ability to attract an audience no matter how obscure or specialised the content offered. Consequences of these processes include a democratisation of the spotlight and the widespread availability of creative content goods that were traditionally constrained to niche markets. The ensuing avalanche of content puts increasing pressure on users' attention and on the information-processing capabilities of available navigation tools, making it difficult for small content creators to make their offerings visible, and conversely, for customers to find suitable goods that match their preferences. These dynamics could lead to a replication of traditional situations, characterised by market dominance of creative content markets by large players with the resources necessary to promote their products in the undifferentiated, crowded online environment.

This issue as well as others – including the growing trend towards decentralised production of content, technologies for content sharing and control, new business models associated to the transformation of creative content goods into services provided in a continuous basis through digital media, and the impact of digital convergence – are addressed in our analysis of technological trends relevant for the creative content sector. We present these in two sub-sections which focus, respectively, on cross-cutting technological developments as enablers for new kinds of creative content goods and activities, and issues specific to content creation, content distribution and user interaction.

Our analysis highlights the importance of communities of users as sources of talent, information, feedback and, perhaps more importantly, content. Their activities are enabled by technologies and platforms which challenge traditional top-down models for content publication and broadcasting. We describe new environments such as Video on Demand (VOD) repositories, peer-to-peer (P2P) networks or virtual worlds which empower users and make it possible for them to create, access, reconfigure and share content in order to devise customised aggregations which suit their preferences better than market offerings. We also discuss how innovative players might tap into them, through the use of their information-processing capabilities, repackaging of user-created content and the provision of easy-to-use platforms where consumers can exercise their creativity and innovativeness, in many cases powered by innovative business models based on transaction fees, micro-currencies, economies of reputation and targeted advertising. The area of advertising constitutes a particularly interesting example of the intersection between creative activities and ICT innovation, and as such it is given particular attention in our analysis.

We also discuss how these new models for content creation and diffusion challenge traditional rationales, and incentive and distribution structures, organised around control over Intellectual Property Rights. This tension is manifest in the ongoing controversies regarding the role, effects and scope of Digital Rights Management (DRM) tools, on which we also focus.

Other important processes currently unfolding include the trend towards distribution and flexibility in the commercial production of creative content goods, associated with the emergence of decentralised networks of highly specialised actors that co-ordinate their activities using ICTs, and the integration of distribution channels into proprietary hardware platforms that provide their customers with seamless user-interfaces, in some cases at the expense of diversity and competition in adjacent markets (e.g. hardware devices or content).

Our assessment of the future evolution of each of the sub-sectors chosen for analysis, taking into account the European situation, is carried out in the last section. Our analysis shows a picture of uncertainty, with two potentially dominant future situations. The first is characterised by growing opportunities for the sort of small, flexible and talented players that populate the European creative milieu, thriving in an open environment where ICT innovation enables direct communication with distant or nascent audiences. The second involves the emergence of proprietary and convergent platforms for content selection and distribution. These convergent platforms, while addressing usability and content filtering problems, and thus offering a solution to compatibility issues which constrain processes of digital convergence, might nonetheless exclude smaller actors unable to overcome financial or technical barriers to gaining access to the users of these platforms. The distinction between the two potential future situations for the European creative content sectors is not so much related to access to audiences or preservation of cultural diversity. Growing demand for highly-specialised, customisable goods makes it commercially sensible for mass platforms to provide access to niche goods (this being a source of opportunity for small, but highly-talented European content creators). The risk of the first situation is that the overall size of the market for content may be smaller, more fragmented, and subject to a lower rate of growth precisely because of the absence of platform (mass markets) and commodity orientation. The risk of the second situation is in the negotiation for access, with the ensuing redistribution of revenue shares in favour of powerful platform owners, essential gatekeepers of audiences in the new convergent context.

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

This Discussion Paper presents an analysis of the impact of emerging ICT technology trends on the Book, Music, Audiovisual (TV and Film), Videogame and Cultural Space sub-sectors whose industrial, business and technological state of the art are characterised in the European context in Discussion Paper 1. We describe the innovative dynamics of the ICT sector and identify a set of promising areas where innovation is highly likely to have a significant impact on the prevailing industrial structures and business models previously presented. We then illustrate the direction of those impacts on each of the sub-sectors. The focus on technological trends of this Discussion Paper is complemented with assessments of consumer demand and other social factors in Discussion Paper 3, in an acknowledgement of the importance that both technology push and demand pull play as drivers for (or obstacles to) the successful uptake of innovations, as well as the influence they have on speed and direction of such uptake.

In Section 2.1 we describe a set of essential features that characterise innovation in the ICT industries, linking them to the technological dynamics of the sector, and identify areas where trends in innovation will have a significant effect on the structure of the creative content sector.

In Section 2.2 we describe these technologies, classifying them within the areas of Content Creation, Content Distribution and User interaction, with a focus on crosscutting impacts spanning sub-sectoral boundaries, specified at a sub-sector level in the case of divergences or particularly interesting cases.

In Section 2.3 we highlight some essential trends of change for each of the considered sub-sectors, defining more precisely the direction of the technological impacts and identifying opportunities and threats which are particularly relevant in the European context.

In the Conclusions we present a summary of the paper's key findings, and highlight the importance of complementing this assessment with a review of user demand as well as social and institutional issues, which is carried out in Discussion Paper 3.

2. DYNAMICS AND TRENDS OF ICT INNOVATION AND THEIR IMPACT ON THE EUROPEAN CREATIVE CONTENT SECTOR

2.1 THE NATURE OF ICT INNOVATION

The places and pace at which the adoption of innovative technologies occurs are determined by the complex interaction of technological, business and social factors, i.e. what we call its techno-economic trajectory. A trajectory can be perceived, at any moment in time, as a direction of incremental change anchored by relatively stable modes of production that utilise installed stocks of capital. Over an interval of time, however, a trajectory is subject to radical shifts as a consequence of the discontinuities produced by changes in technological paradigm.[173] Changes in paradigm occur when novel technologies, which improve production processes and enable the development of new products throughout the economy, appear and become pervasive. For example, the emergence of the current technological paradigm is based on increasingly powerful and sophisticated ICT infrastructures and the numerous adjustments in business methods, organisation and objectives that have accompanied its emergence.

In this section we focus on that source of change, the ICT sector, using an economic framework to present some essential features of its techno-economic trajectory, which explain its innovative dynamics, illustrated with examples from the Creative Content sub-sectors, where their application is having systemic repercussions.

2.1.1 Hardware and bandwidth unbounded

The rapid pace of improvement in hardware performance, associated with the 'Moore's Law' trajectory of improvement in integrated circuit (IC) devices, drives innovation in the sector by permitting a continuing increase in computing power and reductions in the cost of ICT devices and of the networks that link them together. This trajectory has also increased the portability and, in some cases, reduced the power requirements of electronic devices used to capture, store, view or listen to creative content. The IC device trajectory has been accompanied by important complementary improvements in optical network transmission speeds as well as optical and magnetic mass storage technologies. The consequence is that digital storage, processing and transmission capacities have become abundant, and hence relatively inexpensive resources. Because these resources are inputs into other economic activities there has been a general lowering in the barriers to entry for innovative actors in the many industries that utilise these technologies.[174]

This phenomenon is particularly relevant for the creative content sector, which is engaged in the production of highly digitisable goods whose consumption involves important cultural, market, and social aspects. The widespread availability of cheap devices with growing data storage, processing and acquisition capabilities creates an environment with a myriad of opportunities for the development of new production modes, which in some cases are not based on the generation of revenues for the distribution of content, but on economics of

---

[173] Dosi, G 1982, "Technological paradigms and technological trajectories", Research Policy, Vol. 11, No. 3

[174] This has been referred to as the 'democratisation of innovation by Von Hippel, E 2005: 'Democratizing Innovation'. Downloadable book available at http://web.mit.edu/evhippel/www/democ.htm

reputation or the sale of ancillary products.[175] The very low costs of information reproduction challenge existing channels for distribution of content and provide an impetus for the creation of new services that add value to information that is reproduced in different formats and transmitted through different and often new channels. Moreover, the very trajectory that has been responsible for greater computational power and capacity facilitates continued miniaturisation of electronic devices, a development that supports 'wearable' (i.e. extremely portable) computing and communication devices as well as ubiquitous computing (the embedding of computing power in ordinary artefacts).[176] For example, the growing availability and uptake of Personal Digital Assistant (PDA) devices, enabled by miniaturisation and continuing improvements with LCD displays, dimensions of hardware performance (including energy-efficiency, data storage and processing capabilities) and networking capabilities, creates a new 'platform' which is highly suitable for the distribution of digital content goods such as media-rich mobile games, video and eBooks.

Similarly, peer-to-peer (P2P) based services including BitTorrent or Skype have emerged and become successful because of the abundance of broadband resources into which they tap in order to provide mass markets with innovative services (e.g. fast downloading and VoIP telephony) at very cheap prices (or even for free).[177]

In terms of return on innovative investment, these capabilities present new challenges for 'appropriation' (capture) of revenues. Many services are advertisement-supported and the shift to Internet advertising has created the most disruptive force in advertising markets since the advent of television.[178] Other services must look towards other methods of transforming audience into revenue including the direct payment for content and services, the use of the medium for self-advertising accompanied by ancillary activities (e.g. when a band becomes popular through Internet promotion and is able to sell more live performance tickets), the stimulation of related revenue-producing activities (e.g. the use of premium rate phone numbers) or the capture of valuable usage patterns for market research purposes. These various methods of generating revenue are now referred to as 'business models', reflecting the creation of new ways of generating revenue as opposed to the traditional 'business model' of receiving a payment in exchange for a good or service.

2.1.2 ICT technologies as given

New generations take pervasive technologies for granted, that is, not as technologies, but as a part of the environment. This generalisation, which ignores important distributional and digital divide issues, increasingly applies as learning about ICT use (and reconfiguration) has

---

[175] See Lerner and Tirole 2002: 'The Simple Economics of Open Source' Journal of Industrial Economics, 52 (June 2002) 197-234 for a discussion of the economics of reputation (also referred to as 'career concerns' in Open Source software development.

[176] Punie, Y. (2003). A social and technological view of Ambient Intelligence in Everyday Life: What bends the trend? European Media, Technology and Everyday Life Research Network (EMTEL). Seville, Institute for Prospective Technological Studies, Directorate General, Joint Research Centre, European Commission. Available at ftp://ftp.jrc.es/pub/EURdoc/eur20975en.pdf

[177] Although the explosion in demand for bandwidth brought forward by the growing use of streaming and P2P services such as YouTube or Skype has started exerting pressure on the capacities of the networks that support them. See Deloitte 2007: 'Telecommunications Predictions- TMT Trends 2007' Available at: http://www.deloitte.com/dtt/cda/doc/content/UK_TMT_Telecoms_Predictions_2007%281%29.pdf

[178] "An analysis of the wider advertising market [for the UK] shows that total spend on display advertising grew by 2.1% in 2005 to £16.0bn... While newspapers, television, and direct mail accounted for 71.1% of this, internet advertising grew by 73% year-on-year to £1.1bn, increasing its share of total display spend from 4.2% to 7.1%. Internet advertising has now overtaken business magazines to become the fourth largest display advertising medium in the UK ; it is nearly three times larger than radio advertising and more than a third the size of television." OFCOM, UK, http://www.ofcom.org.uk/research/cm/cm06/overview06/coms/

become progressively easier for the younger people in our societies. In a context in which the complexity of devices has become greater and user interfaces have often not kept pace, it is not ICTs that have become easier to use. Users have, to an extent, become better at using (and used to) them. Over the past decade (or, for some, a longer period) people have substantially improved their 'digital literacy' and many are capable of a growing array of self-production activities. This includes self publication via blogs, forums and wikis, and increasingly sophisticated interpersonal communication such as Skype video phone connection as well as exchange of media content, often outside legal boundaries, using peer-to-peer technologies. These trajectories of improvement in user capability play an important role in shaping demand for new types of content as well as tools for content creation and distribution. (These issues are further analysed in Discussion Paper 3). It is however important to emphasise that perceived improvements in the digital literacy levels of the user population, in some cases leading to their engagement in content creation activities exemplified by the success of user-generated repositories such as YouTube.com should not lead to a neglect of the processes through which the skills necessary for higher quality content creation (in some cases able to command revenue more easily) are acquired, inasmuch the tools used in the latter activities are more sophisticated and difficult to master.[179]

2.1.3 Innovation at the edges

The Internet, a communication infrastructure regulated by public, open standards constitutes a system with many opportunities for innovation "at the edges"; the absence of central gatekeepers with the right to decide what kind of devices or systems can be connected to the network, or what fees to charge for such connection, reduces barriers to entrance by new, in some case small, actors with innovative ideas.[180] Innovations that exploit the growing array of 'connection' standards create an ever growing market for the re-use or adaptation of digital content and services. These markets often rapidly reward those innovations that attract vast audiences and also offer higher profit opportunities by catering for diverse tastes (customised goods and services).[181] This process is reinforced by the existence of an environment where the abundance of inexpensive, relatively powerful hardware creates constant opportunities for experimentation and reconfiguration by users increasingly endowed with the necessary skills.

As already stated in 2.1.1, innovative activities in the ICT area based on this model have exerted, and will continue to exert, a considerable influence on the structure and evolution of dominant, potential or sustainable business models in the Creative Content sector. These new business models may not evolve in the direction desired by incumbents such as mass media conglomerates, or they may conflict with legal regulations. The recent cracking of the Digital Rights Management (DRM) measures established to protect the distribution of copyrighted content via next generation DVDs constitutes an example of the sort of unbridled, decentralised process of innovation being carried out by actors operating outside conventional industrial channels, motivated by non-commercial incentives and oblivious or hostile to Intellectual Property (IP) frameworks. To face this challenge, it may be necessary to devise alternative business models for the distribution of this type of content. The content/data

---

[179] EPIS Discussion Papers Validation Workshop, 4th May 2007, IPTS, Seville.
[180] Lessig, L. 2002: "The Future of Ideas", New York: Vintage Books.
[181] Uncertainty or ignorance about the nature of user needs often result in inadequacies in market-mediated supply. In a context of growing digital literacy and pervasiveness of ICT skills, this has resulted in the emergence of user-centric innovative communities, exemplified by the Open Source movement. See Von Hippel 2005 op. cit. p. 11.

'agnostic' nature of ICT communication networks contributes to make the diffusion of such 'outlaw' innovations difficult to detect or stop.[182]

2.1.4 Standards and channels

This data/content 'agnosticism' which we have just referred to does not preclude the existence of a wide range of formats for data storage and reproduction. It is precisely in this spirit that data codified in a wide array of standards can be transmitted seamlessly through communication networks.

The essential need for communication and interoperability that characterises ICT systems underlines the importance of standards, and the processes through which they are established, especially in a context of convergence of digital content. Although industry-wide agreements reduce uncertainty and facilitate the uptake of emergent technologies and formats, creating new revenue streams in terms of sales to new markets and patent royalties, commercial actors might decide to attempt imposing proprietary standards (via market processes or otherwise) as a way to 'capture' customers for specific services or to provide them with a more 'seamless' viewing experience. These dynamics lead to standards wars such as those currently underway in the DVD market.[183]

The polemic regarding the desirability of an interoperable DRM standard for the distribution of music in digital format constitutes an example of the tension between widespread uptake of a technology (or form of digital content) and commercial incentives to attempt keeping control over its development. Although Apple contends that its refusal to license its FairPlay DRM technology to other device manufacturers is based on the need to control access to its specifications for security and user experience reasons, this strategy may lock many online music consumers into Apple's proprietary platform.[184] It has been argued that the current fragmentation of standards in the market, and the exclusion of other devices from access to the iTunes music store may hinder the growth of legal downloading as a competitive channel for the distribution of music content. Similarly, competition between different mobile phone Operating System standards (including Symbian, Microsoft Mobile and embedded Linux amongst others) has been presented as a barrier to the creation and uptake of successful applications for creative content reproduction (particularly video games) in mobile devices.[185]

2.1.5 Winner takes all dynamics

We have already mentioned that the open nature of the Internet allows for processes of innovation to occur at its edges without the need for central approval. This does not imply an absence of barriers to entry in specific markets. These barriers are often linked to the prevalence of 'winner-takes-all' dynamics driven by positive network externalities – an increase in value stemming from the actions of others, in this case the adoption of an innovation. Positive network externalities are sometimes cited as a basis for Metcalfe's Law, the contention that the value of a network becomes larger the more individuals are connected to it. This benefit, received by anyone connected to a network (of adoption or communication), is dependent on others' actions. The existence of network externalities

---

[182] Attempts to thwart the anonymous nature of ICT networks through the creation of surveillance systems have resulted in a cryptographic 'arms-race' between law enforcement agencies and communities of privacy advocates, another manifestation of the sort of decentralised innovative dynamics prevalent in the ICT area.

[183] Historical analyses of such contests show that their outcomes have not necessarily been determined by quality factors.

[184] Jobs, S. 2007: 'Thoughts on Music' Available at http://www.apple.com/hotnews/thoughtsonmusic/

[185] Telemedia Magazine, 2006: Open Mobile Gaming Comes a Step Closer. Available at http://www.telemediamagazine.com/newsitem.asp?docid=836

provides an advantage to those who can first gain prominence with a new technology or service. However, from a new entrant perspective, the value created by network externalities may constitute a major barrier to promoting a new technology or service. In addition, attracting users to a new technology or service may involve switching costs – for users to change they must abandon the capabilities and experience gained in the use of an existing network. The new network must compensate for these switching costs (the costs of restoring the productivity or value offered by the old system) by offering important new advantages.[186]

These dynamics are exemplified by the dominance of World of Warcraft (WoW) in the area of Massive Multiplayer Online Role-Playing Games (MMORPGs). WoW has not simply attracted a very large number of players, it has also stimulated a large investment of participant time in learning how to play the game, in raising the skills and powers of their 'characters'(also called 'avatars'), and in establishing social ties with other members of their "guild." A prospective competitor must make an offering whose novelty and potential is outstanding in order to persuade enough of these users to join, in order to make a worthwhile business.[187]

Market concentration appears constrained by heterogeneity of demand (similar services targeting subtly different markets) and the existence of congestion costs which decrease the quality of the services provided by a dominant platform as population growth starts putting stress on its socio-technical infrastructure.[188] Following the previous example, we do not observe absolute concentration in the MMORPG market in spite of the predominance of WoW, because its fantasy environment (in which magic and spirits reside) will not appeal to, for instance, Science-Fiction fans.[189] Even within the area of fantasy MMORPGs, there is a wide range of participant preferences regarding, for example, game modes (e.g. availability of markets for virtual goods, or emphasis on co-operation versus "solo" gaming) that limit WoW's market-share.[190]

2.1.6 Space strikes back

Contrary to expectations that the mass adoption of ICT technologies and particularly the World Wide Web would lead to cultural convergence under the aegis of 'Globalisation', the growing adoption of various platforms for content display and interaction and the increasing use of online access have enhanced the availability of highly localised content and services, thus contributing to diversity. The "space-agnostic" nature of communication networks, where virtual locations can be accessed on similar terms regardless of physical distance has

---

[186] For a complete discussion of switching costs and their market effects, see Joe Farrell and Paul Klemperer, "Coordination and Lock-In: Competition with Switching Costs and Network Effects," http://www.paulklemperer.org/, May 2006, accessed 27 February 2007, forthcoming in M. Armstrong and R. Porter (eds.), *Handbook of Industrial Organization*, Vol 3. North-Holland.

[187] It should be noted, however, that game environments are a form of entertainment in which some users eventually lose interest due to their desire to consume novelty or learn something new or with dissatisfactions or frustrations that may arise with an existing product, even WoW. These user tendencies pressure MMORPG game developers to continue to enhance and expand their service offerings.

[188] In terms of, for example, bandwidth requirements, or a higher proportion of malicious participants.

[189] A strategy that the owners of a platform can adopt in order to circumvent this limitation is to implement new features appealing to these unattended segments of demand. This approach might increase technological complexity and reduce the quality and coherence of the original experience, potentially alienating the currently installed user base.

[190] It is important to highlight that, as it tends to be the case with other nascent markets, it is not usually the actual first mover the one that ends reaching a dominant position: in a context of imperfect information about user needs, the first mover will probably be unable to deploy a high quality service, and is likely to be overcome by late comers who learn from its mistakes and create more attractive products from scratch, unencumbered by the sunk costs invested in an unsuitable platform. This is, according to some commentators, the reason why former leader in the MMORPG Fantasy market EverQuest was eventually overtaken by WoW.

created new opportunities for creative content creators now able to address their messages, simultaneously, to local and global audiences. This development is particularly important in the context of the creative content sector, which produces goods in many cases characterised by a high a priori cultural specificity.[191]

The success of the YouTube repository of user-contributed videos constitutes an example of such dynamics: although videos are in many cases posted by users in order to communicate with their friends and geographically located groups, they are simultaneously accessible by a global audience with, in some occasions, surprising success in terms of attracting audience and broader public attention.[192] This phenomenal expansion in the range of audiences that can be accessed does not dissolve space, but multiplies it by turning each of the terminals through which a piece of content is accessed into an extension of its place of origin, in a process which does not lead to cultural homogenisation, but to hybridisation and learning. The case of online museums, manifestations of physical space and virtual entities at the same time is another instance of the importance of localisation in spite of the pervasiveness of global ICT networks.[193]

2.1.7 Lost in the long tail

According to the 'long tail' principle, ICT innovations in content creation and distribution such as virtual inventories, Internet Protocol Television (IPTV) and other types of video on demand, music self-publishing in social networking sites and digital printing challenge old rationales that justified the adoption of mass-market models for the production and publication of cultural goods. These technologies dissolve the spatial and physical constraints which limited the range of creative content goods available in the market and open the gates for a flood of new (and old) media. In doing so they have created a new problem, of a navigational nature: in principle, diversity enables access to content goods better suited to a customer's preferences, but it also makes finding them more difficult.[194]

The main reason for the success of Google's search services has been its ability to address Internet users' need for relevant resources, by adopting a scalable algorithm that establishes a webpage's rank according to its reputation. However, its user interface is still too rigid and makes it difficult, for example, to fully specify the type of content a user is looking for. Additionally, this technique, based on a 'Wisdom of the Masses' perception of the web, can in some cases promote content perceived to be useless over content perceived as useful, and be tampered with through search optimisation techniques such as link farming.[195]

2.1.8. Summary

The features of ICT technologies and networks outlined above result in an innovative environment of a distributed, egalitarian nature: the abundance of computing resources, the growing skills of the user population and the lack of institutional barriers to participation in networks bring forward a situation where the possibilities for innovative action by smaller,

---

[191] And essential in areas such as tourism.

[192] Content promotion and distribution takes place through 'word-of-mouth' processes that commercial firms have tried to replicate using 'viral marketing' techniques.

[193] Localisation can be pernicious when the content being transmitted contains, for example, hate messages.

[194] In a context where information is abundant, attention becomes the scarce resource (Simon, H. A. 1971, "Designing Organizations for an Information-Rich World", in Martin Greenberger, Computers, Communication, and the Public Interest, Baltimore, MD: The Johns Hopkins Pres).

[195] i.e. exchanging reciprocal links with web sites in order to increase search engine optimization, as search engines often rank sites according to, among other things, the quantity of sites that link to them.

not necessarily commercial actors are greatly enhanced. In a number of cases, such as GNU/Linux, YouTube, Google, MySpace or Skype, innovation has happened spectacularly through processes strengthened by the 'winner-take-all' dynamics that characterise networked technologies.[196] These innovations have had a major impact on the Creative Content sector because of the informational, highly digitisable nature of the goods and services this sector produces. This impact is heightened by the continuing processes of digital convergence, with the ensuing possibilities for distribution of content through a diversity of channels and media. ICTs enable a traditionally passive population of consumers to start engaging in communication with providers of content, to become content producers themselves, and to interact with others to find and acquire content. These developments change the nature of global audiences and extend the reach of content through a multitude of devices. This 'democratisation of the spotlight' has resulted in processes of cultural evolution with outcomes different from those predicted by the theorists of globalisation during the last decade. They have enriched the diversity of content available instead of homogenising it, although some of the content sectors such as film or television continue to be dominated by relatively few actors (as a consequence of economies of scale in distribution which are being eroded by the new, emergent Internet paradigm). However, the enhancement of the population's creative and content access potential will not, in the absence of suitable business models and institutional frameworks, result in improvements in economic growth, employment or competitiveness: it is necessary to establish a clear-cut distinction between the population's creativity (an important good in itself), and its materialisation in a successful, economically viable creative content sector, without forgetting the essential linkages between both. In the following section we will analyse the impact that innovative ICT trends will have in these two arenas to then focus, in section 2.3 on dynamics of change brought forward by the manifestations of these trends which are particularly relevant to each of the European Creative Content sub-sectors we are studying.

2.2 INNOVATIVE ICT TRENDS AND THEIR IMPACTS ON THE CREATIVE CONTENT SECTOR

Having delineated some essential features of ICT innovation, and identified its loci, it is useful to observe that there has been a progression or series of stages in innovation. Over time, and with increased use of the broadband capabilities, the large corporations that own channels or content libraries and provide services based upon these assets have had to share audience with new entrants exploiting network economies in order to rapidly build audience and content. Most recently, smaller and more flexible players and groups of users who more directly author and control content have emerged. These groups of competitors were summarised by Steinmueller and Mansell 2001 using the terms *incumbents, insurgents* and *virtual communities*. In this section we identify some essential areas where innovation is highly likely to have (or is already having) a profound impact on the dominant structure and business models that characterise the Creative Content sector.[197] We undertake this task in two stages: in sub-section 2.2.1 we focus on basic technological trends with cross-cutting repercussions, while in sub-section 2.2.2 we describe areas of change that can be more easily classified in accordance with the 'content production', 'content distribution' and 'user interaction' framework along which we have organised our Discussion Papers. In the case of the second effort we begin our discussion by identifying emerging socio-economic functions and processes already signalled in our discussion on 'The Nature of ICT Innovation', to then

---

[196] In processes with dynamics of growth strengthened by network externalities.
[197] Steinmueller, W.E. and Mansell, R. 2001: "Mobilizing the Information Society, Strategies for Growth and Opportunity". Oxford: Oxford University Press.

describe groups of technologies which are relevant to them, and the impact of their adoption on the creative content sector.[198]

2.2.1. Technological areas

In this sub-section we describe the state of the art and innovative trends of a set of fundamental areas of ICT where innovation provokes systemic effect across more than one step of the value chain of the Creative Content sector (broadly classified as content creation, content distribution and user interaction). Given the pervasive, in some cases 'infrastructural' nature of these technologies, it is useful to discuss them at the outset of our analysis, in order to provide a foundation for examining their contribution to specific creative, distributive and interactive activities in Section 2.2.2.[199] Rather than a detailed technological description, we illustrate many of these new technologies with examples. Further analysis of these technologies is conducted in sub-section 2.2.2.

The overview below shows the hardware, software and system technologies considered respectively in sub-sections a), b) and c).

(a) Hardware	(b) Software	(c) Systems
Telecommunications Capacity	Open Source	3D Modelling and display
Integrated circuit and processing power	Agile/Extreme Programming	Language recognition and speech
Storage	Object Orientation	Real-time interaction
Display	Embedded Software	RFID
Sensor	Databases	Intelligent agents
New artifacts		DRM

a)   Hardware technologies

Developments in hardware influence the creative content industries by:

- Enhancing the connectivity and performance of distribution channels by which creative content reaches users.

- Supporting the storage of creative content locally and remotely.

- Providing the processing power necessary for digitising and manipulating audiovisual information content.

- Creating new methods of linking virtual computational environments with the biological and cognitive world of users.

In this section (summarised in Table 11) we consider developments in hardware technologies that depend mainly upon technological trajectories shaped by materials science –

---

[198]   For example, the needs for filtering and classifying content can be addressed through a diversity of means of a diverse nature, ranging from search engines to folksonomies.

[199]   Identifying specific impacts that innovation in these areas has on them.

improvements in the properties or the ability to build electronic, optical and magnetic components.

i. Telecommunications capacity

The extension of fibre infrastructure is the principal means by which current data communications might be improved in coming years. The history of broadband has been a continuous debate as to whether and when demand would suffice to compensate for the costs of upgrading networks and it has generally required some 'push' by governments to convince telecommunication network operators to make the commitment to such investments. Advances in broadband capabilities and penetration should enhance the potential for digital distribution of content, and the impacts of other ICT innovations in the sector. Although several technologies are capable of improving the performance of broadband, FTTx (encompassing Fibre-to-the-Home and Fibre-to-the-Building) penetration is a key indicator of high-speed broadband capacity. As of June 2006, there were approximately 820 000 FTTx subscribers in EU28[200] and around 2.74 million Homes/Building passed.[201]

ii. Integrated circuit density and processing power

Moore's law will likely continue to operate for the next two decades and, in doing so, will outstrip our current imagination as to what can be done with the resulting computational power. Because of the stability of this technological trajectory, it makes sense to construct 'advanced technology' platforms in various contexts in which designers and users can devise new applications and services that can provide insights into how to use capacities that will become widespread and affordable at a future point in time. Specifically, the improvement in IC density and processing power means that single integrated circuits will be able to integrate many of the functions now associated with larger systems creating opportunities for continued reduction in size and improved portability. The IPTS work on 'ubiquitous computing'[202] provided a number of important insights into how this might create future product and service market opportunities. In terms of the creative content industries, a major implication of computational power is the ability to manipulate sound and images that, with suitable software, will dramatically enhance authorship opportunities.

iii. Storage

Technological trajectories supporting the increase in magnetic and optical storage density mean that current constraints on local data storage will be relaxed for many different activities. This suggests, for example, that downloading activities related to media acquisition such as BitTorrent are likely to continue to expand. Devices providing time shifting of broadcasts, related programming, additional episodes of television programmes etc. will become more ubiquitous. The creation of large private online storage (file hosting services) means that individuals will increasingly be able to share media with friends and family, possibly leading to further infringements of copyright but also raising interest in the purchase of libraries of content for sharing (family and friends media libraries). What this trend will lead to is unclear though as an important limiting factor is the ability to provide search engines for images and audiovisual material, which in turn depends on the creation of

---

[200] EU 25 + Norway + Iceland + Switzerland
[201] IDATE, "FTTH situation in Europe," Press Release, http://www.europefthcouncil.com/extra/Press_Release/Idate/PR_IDATE_FTTH_CONF_2007.pdf , 7 February 2007, Accessed: 26 February 2007.
[202] See footnote 176.

'metadata' that may be as incomplete and perhaps unreliable as the annotations in many old family photo albums.

iv. Display

Rapid spread of LCD displays is opening the way for a new type of wallpaper in the urban environment. When combined with sensors, wireless data communication and advanced computational abilities, such wallpaper will likely become quite interactive. For example, a visual wallpaper can become audiovisual through the use of Bluetooth or some other wireless standard. Increasing bandwidth suggests that semi-private facilities such as cybercafés and even pubs are likely to become video phone outlets. Passive video juke boxes in the form of MTV wallpaper continue to proliferate and might benefit from user selection (e.g. pay to play). Arcade video games are up for a revival with enhanced displays and various interactive features. Making watching more physical as in the new Wii video game interfaces offers potential for new types of interactivity.

v. Sensor

Accompanying the improvement in wireless connectivity standards and technologies is the ability to craft sensors and sensor networks that increase interactivity. For example, the construction of audience spaces where biosensors provide feedback to light, sound, video, and other features of the space are possible. Interactive theatre in which the audience is either passively or actively involved through various forms of sensor networks is a relatively straightforward application. Improvements in GPS systems allow not only museum spaces but entire cities to become 'documented' with audiovisual tour guides that respond to the individual's own choice of route and pace. The successful Nintendo Wii video game console, which is designed around a shift in the user interface paradigm and based on motion detecting, enhances usability and creates a more intuitive experience which appeals to new markets traditionally discouraged from gaming by the complexity of prevalent dual controllers. These examples illustrate the ways in which sensor innovation can impact the activities of the creative content sub-sector.

vi. New artefacts

It would be very surprising if we were not confronted in the next decade with important new artefacts that expand or enhance the creative industries. Perhaps the most obvious has to do with the extension of mobile phone headsets to that of a generalised interface with the immediate physical environment including the ability to access and control entertainment while on the move (creating a "soundscape" to complement the urban environment but also to help integrate the individual into it rather than simply tuning it out). For example, an artefact that can 'hear' and thus filter between real and virtual environments.

Table 1: Innovative hardware trends and their impact

Technology	Description	Example of impact on Creative Content Sector
Telecommunications Capacity	Faster and more reliable transmission of data via ICT networks.	Increased attractiveness of digital distribution models, and online creative content goods (e.g. MMORPGS).
Integrated circuit and processing power	Increased performance of ICT devices.	New, more powerful devices for content production tools and reproduction devices (e.g. next generation video game consoles).
Storage	Increased storage capacity in devices and networks.	Increased attractiveness of portable devices, and the power of peer to peer networks (by making it possible to leverage a larger installed storage base).
Display	Cheaper, higher quality display screens.	Lower cost of devices, increased quality of content reproduction (e.g. mobile phone screens, touchpads, e-ink)
Sensor	New input/output devices.	Increased interactivity potential and innovative user interface paradigms (e.g. Wii-mote).
New artifacts	Advances in a broad range of areas enable the development of new types of artefacts for content creation, transmission and reproduction	New markets and modalities for access/diffusion of content (e.g. music creation features in mobile phones).

b) Software technologies

Technological change in software is difficult to characterise. On the one hand, methods for constructing software are advanced through the creation of new algorithms, new languages for coding, and new methods for organising the management of design complexity. Over time, a myriad of small improvements in each of these areas produces major progress.[203] Any single change, even one of those heralded as major new software paradigms, rarely has a large and immediate impact. On the other hand, the use of these techniques produces ever larger and more complex bodies of code that are difficult to maintain and upgrade. For the creative content industries, software is often a means of supporting the creation, distribution, and access to content. Software is often also content – computer games are software and interactive audiovisual content relies in a fundamental way upon software. In this sub-section we identify five areas in which new technologies (including methods of organisation) are very

---

[203] Boehm, B. W. (2006), "A View of 20th and 21st Century Software Engineering. ICSE'06," Shanghai, China, available at http://sunset.usc.edu/events/2006/CSSE_Convocation/publications/BoehmViewof20thand21stCenturySE.pdf (accessed 27 February 2007).

likely to have an impact on both the support of creative content industries and the products and services that these industries produce. Areas that we do not consider include compression, rendering, and computational algorithms[204] which facilitate the creation of content or are embedded in it. In these areas, improvements are often incremental and closely linked to the hardware trajectories discussed in the previous sub-section.

i. Open source

Open source software has succeeded in providing a very large library of re-usable code. Re-usability is an important source of cost reduction in software development.

This library is likely to continue to grow, providing software designers with the basic tools for delivering their services by customising generic solutions that are maintained collectively to address specific customer or personal needs. Progress in this direction depends upon continued efforts to provide well-defined standards for interoperability so that systems with open source elements can be reliably designed. All software, including open source, requires regular maintenance to extend its utility as the definition of computing platforms (and their myriad of accessories) evolves. When open source software involves an active community of developers and users, its quality rivals or exceeds that of software developed 'in house' in leading software firms. Being 'open source' does not, however, assure quality – many projects have low rates of participation or are abandoned, events that also occur with proprietary software. While open source software can be designed to support proprietary modes of content distribution and access, the open source community is often hostile to business models based upon digital rights management of all kinds.[205]

ii. Agile and extreme programming

The Agile and Extreme Programming paradigms constitute organisational innovations initiated with the goal of increasing the speed and efficiency of software development processes, and delivering products which are better suited to the needs of users.[206] The adoption of a rapid development approach which focuses on prototyping and continuous iterations (instead of the creation of highly detailed specification documents), and the inclusion of the 'customer' into the process of creating the software product has been applied in the area of video game development with successful results. Given the increasing reliance of creative content production and distribution structures on software systems, we would expect that any enhancements on the quality of the latter brought forward by innovative techniques such as Agile and Extreme Programming should contribute to lower barriers to participation (by decreasing development costs) and increase user satisfaction (thus increasing the adoption of such ICT platforms).

iii. Object orientation

Accompanying open source development, the extension of software construction techniques involving object libraries is an important feature of the new software environment. Software

---

[204] Compression algorithms allow a reduction in the size of data streams representing creative content and thus save on storage and transmission costs. Rendering algorithms provide methods for enhancing visual displays by providing methods for simulating the complex interactions between light sources and objects that reflect, absorb, and diffuse light. In the atomic world, these interactions are a physical phenomenon. In virtual worlds, they have to be simulated to produce an engaging 'virtual reality.' Computational algorithms support both compression and rendering as well as enable the virtual simulation of other physical phenomenon such as aerodynamics, gravity, and friction. Rendering and computational methods play especially important roles in 3-D modelling and display discussed in the next subsection.

[205] There are exceptions to this generalisation. See http://authena.org/ (Accessed: 27 February 2007) for discussion.

[206] Keith, C. 2006: 'Get in the Game: What Others Can Learn From Games Developers'. Better Software November 2006.

objects are self-contained modules of code that can be readily integrated to form larger systems. These modules are meant to be highly re-usable and involve careful specification of a function that produces well-defined outputs from clearly specified inputs. For example, object modules for keeping time and periodically re-calibrating themselves using online clock time standards might be the basis for a desktop clock, interacting with other modules that define the shape, location, and features of the item on the desktop. Object libraries allow users to construct their own desktop and other virtual environments by providing elements that work together in a particular context. Object-oriented programming concepts originated in the 1960s and are an important tool for large scale software design. The use of these concepts to provide users with a greater degree of control over their virtual environment is a more recent development offering an expanding array of opportunities. Plug-ins, add-ons, desktop gadgets, 'skins,' filters, and converters are all terms used for the application of object-oriented programming techniques in user environments. As creative content producers devise increasingly complex artificial worlds and other virtual environments, 'objects' come to have an additional meaning. In Second Life, for example, users have fairly powerful tools for creating virtual 'spaces' and 'artefacts' and reproducing their content. The Second Life business model provides users with a means of selling their creations to others and, increasingly, the exchange of virtual artefacts will become an important activity. The same principles are used in creating emoticons and other embedded graphics for inclusion in e-mails or mobile SMS (short message service) messages.

iv. Embedded software

The proliferation of 'intelligent' artefacts (i.e. artefacts with sensor, computation, and communication capabilities) will require a continuing expansion of software embedded in specific devices. The relatively limited set of standards for such devices means that it will become increasingly difficult to maintain, retrofit, and upgrade such systems as new waves of technological change occur.[207] At present, with the possible exception of environmental concerns about the growing volume of electrical and electronic waste in the form of obsolete devices, there seems to be little concern for this issue. One possibility is that we will continue to regard electronic devices of all sorts as impermanent, i.e. disposable, artefacts – expecting them to be replaced by newer and better devices as technological progress occurs. An alternative would involve a greater concern for designs that could be upgraded and maintained. How to achieve the second objective with current incentives is very unclear. It is ironic, however, that embedded software is often employed to customise general purpose electronic components – i.e. components that could, in principle, be programmed for alternative purposes with a new set of embedded software.

v. Databases

The engine behind online media are databases that contain their creative content. Advances in the standards and also in the technical methods for creating and maintaining databases can have powerful impact on the variety and quality of online media. First generation World Wide Web pages were static, containing the entire content of what they would display when opened by a browser. Many web pages, and the predominance of commercially sponsored pages,

---

[207] One exception is CORBA (Common Object Request Broker Architecture) which does, in principle, provide a standard for software objects in an embedded software environment. See http://corba.org/ (Accessed 27 February 2007). The use of a standard such as CORBA for developing embedded software does not, itself, assure that the final system will be maintainable or upgradeable as this requires additional design elements.

contain code that works with the browser to fetch and assemble the contents of a page at the time that is requested by the user.

The contents of many web pages transmitted over the Internet are determined by the user. For example, Google search pages are created dynamically in response to the search specifications of users, which in turn are automatically analysed in order to provide context-relevant advertising as well as the addresses of sites that might be responsive to the user's request. Google's search engine is powered by several databases that are compiled automatically using an automated 'spider' to crawl the World Wide Web and extract information from the pages that this automated device recovers.

A principal limitation of Google's spider is that it is not capable of engaging interactive features of web pages. This omission has given rise to the terminology, the 'invisible web' or 'the deep web,' referring to that portion of the Web that is not covered by Google or other search engines that compile databases by capturing content from the page as it is first accessed. Information that is stored in databases accessible from web pages is, in other words, most often not accessed by search engine technologies presently in use.

Moreover, although Google's method of 'page rank' provides a useful index of the extent of attention that a particular page receives in terms of links to it, records of it being accessed on publicly available databases etc., Google and other search engines have limited semantic capabilities. They do not relate the individual search terms to one another. Efforts to add greater semantic content to web pages would make it easier to find relevant information and is an objective of those who advocate the 'semantic web',[208] the Internet creator Tim Berners-Lee being one of them. There is, however, substantial reason to be sceptical about the future of the semantic web.[209] There are also clear limitations to existing search engine technologies for identifying and grouping information of relevance for a given customer. Improvements in organising databases of information and customising information (media, content) location remain to be made. An important possibility is the use of user preferences as a means of shaping the performance of interfaces.

---

[208] See http://www.w3.org/2001/sw/ (Accessed 27 February 2007)
[209] See http://www.well.com/~doctorow/metacrap.htm (Accessed 27 February 2007)

Table 2: Innovative software trends and their impact

Technology	Description	Example of impact on Creative Content Sector
Open Source	Accumulation of software tools and applications available under open source licenses.	Lower barriers to innovation through the recombination of open source software (e.g. JOOST), availability of cheap and high quality systems for content creation (e.g. video game engines).
Agile/Extreme Programming	Organisational innovation to increase the efficiency of software development.	Creation of higher quality content (e.g. video games), development of better software infrastructures for the creation and delivery of content.
Object Orientation	Creation of object libraries that can be rearranged to create new applications and systems.	High customisability of software products and integration of collection of contents (e.g. modular Content Management Systems, content libraries in Second Life).
Embedded Software	Widespread diffusion of intelligent artefacts.	Further integration between different components of the value chain (e.g. access to information about 'intelligent' content products via mobile phones).
Databases	More advanced data classification and retrieval structures.	More sophisticated search engine technologies.

c) System technologies

Differently from the areas of hardware and software, which can be seen as basic infrastructural elements over which ICT platforms are built, this section deals with innovative trends in specific application areas which form part of broader production and distribution systems of particular interest for the creative content sector.

i. 3D modelling and display

Technologies for 3-D modelling and display are moving rapidly and many problems have been solved in the gaming environment. Spill-over to other contexts may be expected, but 3-D modelling in the games environment does not constitute a complete model for how display and interaction may be managed in other contexts. These observations indicate that the process of building 3-D modelling and display systems involves important particularities. For example, the techniques used in game environments are typically unsuitable for the creation of artistic animation – a different trade-off between image quality and the speed at which the image can be moved or moved around is required for artistic animation. At least some of the greater processing power that will be delivered by the continued pursuit of the Moore's law trajectory is highly likely to be devoted to more powerful and general purpose image generation engines.

ii. Language recognition and speech

We are very close to a major breakthrough in speech and language representation, which will allow natural language interface with computers to become a dominant mode of interaction. This statement has been made for over twenty years, but there is some basis for believing that it may prove accurate over the next decade. This breakthrough will have major ramifications. While it is not clear whether speech will be more effective than typing as a means of data entry, it is clear that speech inputs would simplify a variety of interfaces in ways that would facilitate important new uses of ICTs in particular by the creative content industries. For example, one may imagine that avatars in a gaming context would be able to speak using words typed or spoken by a user, so the users would be able to verbally interrogate automated representatives of content suppliers regarding content, and that new opportunities for elaboration of creative content would emerge, involving variations or improvements upon the model established by Eliza, an early computer programming language that simulated a human psycho-therapist in its interaction with users.[210]

iii. Real time interaction

One of the consequences of much faster processing speed is that ever more sophisticated audio and visual environments (recorded or imagined) can be delivered with higher and higher degrees of realism. Realism, however, is not an end in itself. A photo-realistic production also has to have some sort of artistic component to make it engaging entertainment. If technological capabilities offer new opportunities for photo-realistic expression, their deployment as a cinematic 'language' which viewers understand is likely to take some time (e.g. animated cartoons have built such a language over a century).

Real time interaction also involves other possibilities such as aggregating audience response. Using either sensor or communication devices it is possible to visualise responses from groups of people and provide feedback to human performers or software systems that may, in turn, alter their response. Altering interactivity by making a group rather than an individual process is one of the features of many 'live' artistic performances and the possibility of real time interaction could create a variety of new forms for creative content.

iv. RFID and other forms of 'interrogatable' subsystems

As noted earlier, mobile tracking offers a means to create location-specific information. More generally, the ability to interrogate objects with wireless embedded systems changes the logistics of inventory and shipping of all physical artefacts. A primary implication for the creative content industries is that physical instantiations of products can be more readily warehoused and stocked (the costs of maintaining an inventory are reduced). Whether this is sufficient to counter 'on-demand' publication is uncertain.

v. Intelligent agents

Expectations with regard to intelligent agents have been high for a long time. Progress in their design, however, is somewhat disappointing. In gaming environments it is now common to have artificial opponents and even artificial characters. Artificial agents are less successful in relating to more complex spaces so that the vision of having an artificial agent that can reliably search for information is still largely a vision rather than a reality.

---

[210] The Wikipedia entry on Eliza is a good starting point for learning about Joseph Weizenbaum's creation http://en.wikipedia.org/wiki/ELIZA.

vi. Digital rights management

Digital Rights Management (DRM) technologies are based on the creation of digital fingerprints in content goods that have to be verified by hardware devices in order to be reproduced. The development of these system, based on matches between different pieces of information (such as encrypted keys or watermarks) stored in content and devices produced by decentralised networks of actors creates important problems, as, for example, the leaking of the keys by one of them renders a player open to reproduction of illegal content.[211] New technologies such as the Advanced Access Content System (ACCS) for next generation DVD players have attempted to eradicate this weakness by implementing technologies that make it possible to track down key leaks by specific players, who would have their future keys revoked (and as such would be unable to reproduce new content encrypted with updated keys). The extent to which this technology, which also enables the creation of back-up copies of owned content by users will be able to curtail the reproduction of illegally copied content might be limited by the development of modified DVD players able to de-encrypt content without the need for the hardware key, an illustration of the problems associated to creating crack-proof DRM systems.

Table 3: Innovative systems trends and their impact

Technology	Description	Example of impact on Creative Content Sector
3D Modelling and display	Improvements in 3D modelling and display technologies.	Decreased costs in animation for video games and audiovisual production.
Language recognition and speech	Enhanced reliability of language recognition and synthetic speech generation.	Enables the development of more intuitive user interfaces based on voice, improvements in accessibility for digital distribution of content.
Real-time interaction	Increases in the quality of interactive experiences.	More immersive video games and virtual worlds, creation of feedback loops between content creators and audiences in real-time (e.g. in online performances).
RFID	Radio frequency identification of devices and goods.	Improvements in the efficiency of e-Commerce logistic systems, further possibilities for localised content delivery (e.g. localised mobile gaming).
Intelligent agents	Development of enhanced artificial intelligence and expert systems.	Improved search facilities and pattern recognition (e.g. in the context of online platform usage) to optimise content displays etc.
DRM	Stronger DRM systems able to track encryption key leaks.	Better control over the reproduction of content by users, higher granularity in the management of user rights to avoid violations of fair use.

---

[211] This has been the main reason adduced by Apple in order to justify its denial to license its music DRM standard, FairPlay.

d) Summary of technology areas

The aim of this section was to highlight the range of technological changes influencing the creative content industries. In general, the role of technology in the creative content industries is facilitative – technology provides new opportunities for content creation, distribution and use (and conversely, constrains what can be achieved at a given moment in time). While this is a general outcome of technological change, what the review highlights is the extent to which technological change is distributing control of the processes of content creation and distribution and extending opportunities for the use of creative content at different times and places. These changes tend to be disruptive – they interfere with or challenge existing practices and business models in the creative content industries. If one prefers to take a sceptical stance regarding 'technological determinism' then it is in the way these technologies have been developed and deployed that their disruptive impact has emerged.

A second observation about the technological developments reviewed in this section is that, in many cases, their force is gathering rather than dissipating – they are likely to have even greater impact in the future than they do in the present. This is particularly evident for technologies that extend the use of the Internet as a medium of distribution for creative content and the related software and hardware developments that support the creation, storage and indexing of this content so that it might be effectively distributed or 'viewed' by those interested in it.

A third observation is that those developments are complementary and mutually reinforcing. Developments in storage technology provide opportunities to decentralise the control of distribution with its attendant problems of violating the copyrights of those seeking to retain it while raising the value of tools for content creation. These developments, are, in turn amplified by software developments that enhance the creation and use of databases. The creative 'recombination' of these technologies offer further commercial opportunities for those who can devise business models that translate audience into revenue and non-commercial opportunities for those who wish to engage in self-publication or interaction with others sharing similar interests.

Each of these developments, and particularly the last, has major implications for the future of the creative content industries that we examine in the following section using the 'value chain' that links content production, distribution and use.

2.2.2 Steps of the creative content value chain

The previous section outlined a considerable number of technological developments that are relevant for the creative content industries. While individual technological development can open up many new market opportunities, it is also important to consider combinations of developments. The recombination of technologies is a particularly fertile area for innovation in the creative content industries. For example, the use of web-based technology in combination with mobile telephony and improved artificial speech would offer the possibility of listening to news on-demand and on the move.

It is useful to provide some structure for examining how these new technological opportunities are being exploited by contemporary innovators. In order to do this, we adopt a pragmatic approach that begins with defining broad socio-economic issues which are, or are likely to become, particularly relevant for the Creative Content sector, to then highlight innovations related to them, and finally discuss their impacts. The adoption of this approach

makes it possible to analyse technological trends flexibly, never losing sight of their relevance and impact on the different groups of stakeholders, including business firms at different steps of the creative content value chain, communities of users/consumers and society at large. At the same time one should acknowledge the fact that very different sets of technologies might have a bearing on the same issue, in some cases in divergent directions. An example of this would be how developments in Peer-to-Peer (P2P) and Digital Rights Management (DRM) technologies impact issues related to control/diffusion of creative content in opposite directions.

It is important to highlight that the following discussion is not organised across the sub-sectoral lines adopted in Discussion Paper 1. Instead, the discussion is organised according to the broad domains of application that often span the different markets and actors discussed in Discussion Paper 1. We nevertheless provide examples of promising technologies in specific sub-sectors throughout the discussion as a way of illustrating the application domains. The relevance of the application domains to specific sub-sectors is developed further in Section 2.3, where we outline unfolding trends of change in these individual sub-sectors. We have adopted this approach in order to avoid redundancies: our analysis shows convergent trends not only in terms of availability of digital content through a diversity of devices (and of a diversity of content types in the same device) but also in terms of the applicability of families of tools and platforms (for distribution and user interaction) to sub-sectors engaged in the production of seemingly heterogeneous creative content goods, with similar impacts on industrial structures and business models across sub-sectors. For example, advances in search and filtering technologies are relevant for books, music, video games and audio-visual content, and their impact can be therefore more efficiently discussed in a joint section.[212] So, we argue, convergence is not limited to the creative content product, but also applies to the processes through which it is created and distributed, sold or shared, as we show in the following discussion.

Sub-sections a), b) and c) below focus on the following trends for each of the content creation, content distribution and user interaction areas:

(a) Content creation	(b) Content distribution	(c) User interaction
Empower Creators	A Brave New Digital World	Close Encounters with the user community
Standing on the shoulders of Open Source	Move it to the Web	User Bazaars
Integrating decentralised assets	Making sense of it all	Self-publishing paradigm
	Controlling Access	
	P2P not only as a threat	
	More than gadgets	
	Digital Advertising	

---

[212] Arguably, this convergence is not limited to creative content goods, but applies to any commercial activities that incorporate information goods, namely, to the whole economy: this is a manifestation of the pervasive nature of the technologies that constitute the new paradigm.

a)   Content creation

This area includes issues related to the processes through which creative content goods are created.

i.   Empower creators

In Discussion Paper 1 we argued that the relatively high fixed cost necessary for the creation of the 'master copy' of a Creative Content good resulted in the need for initial investment, usually provided by publishers (also referred to as 'producers' in the case of the audiovisual industry) in exchange for the Intellectual Property over the resulting good that they then promoted and distributed. Advances in software and hardware have however brought forward highly sophisticated and powerful, relatively inexpensive and easy to use tools and suites. Those range from text and image editors or animation software development kits to digital cameras and recording and sound editing applications. By using such tools talented creators can produce creative content goods of a professional quality with a reduced need to resort to external funding.[213]

The impact of these new tools, which continue improving, becoming cheaper and more user-friendly, cannot be understated:[214] they have opened up opportunities for participation in creative activities by social pools of talent which had so far remained untapped, blurring traditional boundaries between 'authors' and 'users'. The outcome of this process has been a surge in the quantity (although not necessarily the quality, inasmuch talent remains a scarce resource) of creative content goods available, and new business opportunities for those publishers capable of selecting those goods which are better suited for a repackaging targeted at mass market audiences. The lack of reliance on external funds also contributes to enhancing the bargaining power of content creators, who might in some cases decide to resort to digital distribution and self-publication strategies (on which we focus in b) and c) below) completely bypassing the need for intermediaries between them and their audience.

It should be noted that although these tools enhance the creative potential of individuals, in some cases their fruitful utilisation requires skill-sets which go beyond those that can be in most cases acquired through experimentation 'at home'. This raises important issues related to the need to provide education and training as a way of enhancing the competitiveness of the creative content industries.[215]

ii.   Standing on the shoulders of Open Source

The Open Source movement has provided technically-savvy content creators with powerful, freely available, and, perhaps more importantly, highly customisable and extensible tools. The adoption of its legal instruments to the field of content, through the definition of the Creative Commons license, has given rise to the emergence of large repositories of free content which can be accessed, modified and incorporated into new creative works by anyone who desires to do so, contributing again to lower the barriers to participation in creative activities and favouring the elaboration of innovative amalgams of content and technologies, often referred

---

[213] It is important to note that the piracy of these tools and their downloading via peer-to-peer networks has enhanced their availability.

[214] There tends to be a trade-off between the number of available features (power and flexibility) in a tool and its ease of use, which could conceivably be bypassed through the implementation of innovative user interfaces able to adapt to the preferences and capabilities of a user in order to provide her with a suitable level of functionality.

[215] Inasmuch more powerful tools are required for the creation of high quality content 'meals' (as compared to 'content snacks') better suited for the creation of revenues in the highly competitive entertainment marketplace.

to as 'mash-ups' (an example of which would be the BBC Digital Archive currently under testing).[216] Open Source might, in this context, lead to positive externalities by enabling content creators and publishers to take advantage of the diffusion and distribution potential associated with the emergence of high capacity digital distribution and reproduction networks.

iii. Integrating decentralised assets

The broader, contextually richer nature of emerging high capacity communication channels (such as Tele-Presence), and the growing adoption of Electronic Data Interchange, Version Control tools, content management and bug tracking systems and wikis have given rise to new possibilities for specialisation. Decentralised networks engaged in the creation of modular goods composed of a wide range of assets start becoming more common. In many cases this trend appears in outsourcing processes: creative actors develop key concepts and brands but contract out production functions to external parties selected according to a diversity of criteria (e.g. with the help of online resources such as professional sites and listings), before integrating them again into a coherent product (or family of products adapted to different hardware formats and local markets).[217]

These same technologies make it possible for communities of content creators to engage in joint artistic activities without the need for co-location: A Swarm of Angels – a film project currently being developed using an Open Source Model – and eJamming, which makes it possible for musicians to play together from different locations, constitute examples of this trend.

Table 4: Issues, technologies, impacts and sub-sectors in content creation

Issue	Technologies	Impacts	New Business Models
Empower Creators	Cheap recording and editing tools.	Lower barriers to entry in creative content markets.	Reduce the importance of publishers as sources of funding for creative content goods.
Standing on the shoulders of Open Source	Open Source software and open libraries of content.	Lower barriers to entry in creative content markets.	Reduce the importance of publishers as sources of funding for creative content goods.
Integrating decentralised assets	Telepresence, EDI, CMS, CVS, Bug tracking, wiki.	Increase the possibilities for decentralised production of creative content goods.	Outsourcing.

---

[216] The adoption of 'boiler-plate' license models also reduces the transaction costs in which content creators need to incur in order to use (or license) proprietary tools and content (see Benkler, Y. 2002: 'Coase's Penguin, or Linux and The Nature of the Firm', Yale Law Journal 112 (3).

[217] See IBM 2004: 'Media and Entertainment 2010' available at http://www-935.ibm.com/services/us/imc/pdf/ge510-3569-01f-media-2010.pdf and Serapian 2006: 'Project post-mortem: Stubbs the Zombie' available at http://gamasutra.com/features/20060811/seropian_01.shtml for examples of the benefits and barriers to the adoption of this model.

b) Content distribution

This area deals with issues related to the channels and processes through which creative content is distributed and accessed.

i. A brave new digital world

In the previously described context of improved storage and transmission capabilities, and growing broadband penetration, the trend towards increased online availability of digital creative content will become stronger. This process challenges the position of incumbent players who have, in the past, relied on their control over physical channels for distribution and commercialisation of creative content goods using traditional, top-down publishing/broadcasting models. It also opens up new opportunities for content creators, who can establish direct linkages with their audiences by adopting flexible, more interactive models for online-based distribution in some cases through specialised portal providers (examples of which would be Apple with iTunes, Microsoft with Xbox Live or Valve with Steam). The increasing availability of highly customisable, user-friendly (in many cases Open Source) Content Management Systems such as Plone, Drupal or Mambo, make it possible for small actors to simultaneously manage their assets, present a 'professional face' in the web and promote the emergence of user communities around their products. The elimination on the one hand of past physical constraints in the area of inventory and supply chain management, and on the other, with Internet Protocol Television (IPTV) and Digital Audio Broadcasting (DAB) or Podcasts, of limitations inherent to radio-frequency transmission, makes it possible to adopt highly flexible, dynamic and scalable models for the release of stocks of creative content goods, with continuity replacing discreetness: 'out on Monday' becomes 'out yesterday, now and tomorrow'. This flexibility also makes it possible to disaggregate creative content goods in their constituent parts e.g. albums and singles, books and chapters, video games and levels, TV channels and programmes. This increases consumer choice and establishes new avenues for promotion based on the distribution of samples and 'demos', in some cases using viral marketing strategies. An example of such activity would be record label provision of mp3 songs from a forthcoming album to music mp3 blogs in order to generate expectation ('buzz') amongst fans or the release of demos and embeddable clips in the respective cases of video games and audiovisual content.

In this environment where access to constantly updated content is enhanced exponentially, the main issue that emerges is that of creating sustainable revenue streams through the implementation of user-friendly methods of payment which reflect the flexible, highly dynamic nature of the medium. In the absence of a successful standard for micro-payments, and the reliance on systems based on credit cards (whose uptake is hindered by mistrust on the security of online transactions, and neglect of younger customers), some providers such as Microsoft with its Xbox Live platform, Linden Labs in Second Life or Doubloons in Puzzle Pirates have decided to establish their own micro-currencies, adopting models based on the physical purchase of 'digital vouchers' which can be redeemed online. Another channel for payments popular, for example, in South Korea places Internet Cafes as intermediaries with a financial function between customers and content providers.[218]

Another promising revenue model that can be adopted to leverage the highly fluctuating nature of 'virtual shelves' is that based on periodic subscriptions where a customer pays a flat rate to obtain, in exchange, access to content on an 'all you can eat' basis or using differential

---

[218] Antikainen, H., K., S. and Vainikainen, S. 2004: 'Three Views on Mobile Cross-Media Entertainment'.

pricing rates for access to premium content. This strategy, already established in the case of TV, is based on building a sustained relationship between content provider and users, with the potential advantages of promoting the creation of communities of customers. This might as well enhance brand loyalty and increase the efficiency of feedback loops enabled by the interactive nature of these platforms.

ii.   Move it to the web

The mass adoption of web-based applications such as Gmail or other Google applications is part of a trend that could transform deeply the nature of software provision, completing the shift from shrink-wrapped product to service, and potentially leading to a reconfiguration in the traditional architecture of the web, with a migration of computing power and data from personal desktops (which would become 'thin clients') to centralised servers (operating according to an intranet model).[219] This process redefines the technical specification requirements of personal computers and other hardware devices used to access content, with traditionally important features such as data storage capability losing importance in favour of connectivity. The new space available in these devices might lead to a further drive towards miniaturisation or open up possibilities to dedicate available resources and 'hardware real-state' to enhancements in battery power or screen size and resolution, addressing limitations which have hindered the uptake of creative content consumption such as video or video games in certain devices such as mobile phones.[220]

The repercussion of this process on the industrial structure and business models of the creative content sector can be, to an extent, extrapolated from the MMORPG sub-sector, as well as from dominant creative content based social-networking sites such as MySpace or YouTube, which could be conceptualised as 'web-based' applications for accessing content (music and video, respectively). In these cases what we have observed so far are subscription-based services and radio-like advertising-supported models. A more fundamental shift brought forward by this trend could be expected to occur in the industrial structure of the creative content sector, as mobile carriers and providers of web-services growingly become the distributors and aggregators of content, replacing traditional publishers, in a move along the lines observed in the area of mobile and browser games. This however need not be the case, as long as publishers are able to acquire the necessary capabilities to store and serve online content to their customers, as is already the case with IPTV, and as the emerging trends in digital distribution of films to theatres seem to indicate.

iii.   Making sense of it all

We have already argued that the lowering of barriers to content creation and access have resulted in a flood of creative content, available through a panoply of online catalogues, stores and auction sites. This results from the widespread uptake of self-publishing tools, digital platforms for content distribution and eCommerce, and database solutions for the commercialisation and management of virtual inventories of physical goods. Although in principle this process makes it possible for niche providers to find, or in some cases, create an audience, and for the most demanding of customers to locate what she is looking for, the confluence of demand and supply is unlikely to happen in the absence of powerful tools for content indexing, browsing and filtering: paradoxically, the same process which makes it

---

[219] The growing use of Internet connections for the provision of additional features, patches and upgrades, as adopted by Microsoft, conduces to a similar transformation in the character of software, retaining current technological endowments between different components of the network.

[220] Ibid

possible for small creators and publishers to distribute their content bypassing those physical limitations which have traditionally constrained the range of their activities threatens to, simultaneously, bury them under a flood of information where the only emergent islands would be 'inhabited' by those actors with the financial might necessary to purchase visibility via promotional campaigns and advertising.[221]

Virtual communities and weblogs contribute to address this problem through processes of 'synthetic re-intermediation' by providing 'guides', 'resources' and 'reviews' for particular social groups and user communities, their activities being funded through advertising-supported and, in some cases, subscription-based models. Their usefulness is however limited by the extent to which they can scale their activities in a context of exponential growth in the amount of content available: additionally, as their number increases, the searching and filtering problem re-emerges, in this occasion applied to them.

Folksonomies such as Digg, Diigo, Technorati or Delicio.us constitute another family of socio-technical innovation that have emerged with the goal of filtering relevant news, content, communities and resources in the web: they supply any user willing to do so with the tools necessary for tagging and evaluating online content and news, in some cases establishing peer-rating systems to score the reliability of their suggestions.[222] Some of these also provide tools to create **mash-ups,** i.e. web pages that combine various data sources to create a unified interface and experience. The main strength of folksonomies, which lies in their capability to leverage the assessments carried out by large numbers of human participants is sometimes also their weakness, inasmuch they only provide users with rankings of popular, mostly novel, items, not necessarily useful for more sophisticated searches for specific types of content, in some cases of an archival nature.

Search engines, of which Google constitutes the most successful example, are essential aides for undertaking this kind of task. However, few users have the necessary skills and knowledge to make best use of its capabilities, and its interface is relatively limited at the articulation of user preferences in a search algorithm that will present her with relevant, useful results (especially when dealing with non-textual pieces of content). This shortcoming could be addressed by enhancing the possibilities for user interaction. Although this is already partially accommodated in Google's page rank system that ranks searches according to user choice regarding linking structures, the degree of customisation and responsiveness to user requests is still quite small. The French-funded project **Quaero** aims to create an engine which addresses these limitations, by making it possible to interrogate users and take account of the information they provide in order to craft better information search strategies. Such a system would seem to require the widespread acceptance (and use) of standards and protocols for the tagging of available and new content with metadata, which would then be analysed and retrieved by intelligent agents/applications[223] along the lines of the roadmap for the **Semantic Web**.

The central position of these different tools, strategies and communities as gatekeepers, sorters and classifiers of relevant digital information have turned them into important targets for spammers and link optimisers, in a process which has led to an arms race between them and other actors intent on promoting their websites and products through dubious techniques such as link farms or voting cliques. The development of more advanced systems for managing trust, and the implementation of low-level intelligent agents able to identify such

---

[221] Paraphrasing the Leopard by Giuseppe Tomassi di Lampedusa, everything would change so it remains the same.
[222] The Amazon review system is organised along similar lines.
[223] There is almost absolute lack of information regarding the technologies that Quaero will adopt in order to accomplish this task.

opportunistic behaviours constitute two possible strategies to protect content rankings and lists from commercial biases.[224]

iv. Controlling access and management of user rights.

In the environment of enhanced access created by new technologies for the distribution of digital content, ensuring control over its use has become a more problematic issue for copyright owners, as the controversies about the impact of files-sharing and piracy on decreasing sales (especially in the case of the music sub-sector) continue raging, and new, more highly sophisticated DRM systems are implemented in content support formats only to be immediately cracked by technology-savvy users.[225] The ongoing debate between Apple and music publishers regarding the desirability of an interoperable DRM shows a movement away from strong systems which impose important restrictions on user's rights and create opportunities for the exercise of strategies of differential pricing by copyright owners towards more tolerant systems such as FairPlay. In some cases DRMs have been abolished altogether (as has been the case with the catalogue of EMI records in the iTunes Music Store)[226]or are to be replaced with **digital watermarking** technologies which enable the identification of those users who distribute content illegally.[227] This trend might contribute to alleviate a crisis which has harmed the creative content sector by antagonising rights owners and their audiences, reducing the attractiveness of legal downloading sites (inasmuch the goods available through them are considered crippled compared to DRM unencumbered content available in illegal filesharing networks) and constraining competition in adjacent markets (e.g. hardware, in the case of the music sub-sector).[228] The establishment of licensing agreements that would permit the copying of HD-DVD and Blu-Ray DVDs by consumers, for backup purposes, appears to be a step in the same direction in the case of the audiovisual (and video games) sub-sector.[229]

In a context of scepticism about the suitability of the DRM paradigm, an alternative that has started gaining credibility, and is already being discussed at a policy level is that of legalising files-sharing and compensating copyright owners through **a blanket licence** collected from users of filesharing networks (or simply broadband subscribers, depending on the proposal) and distributed amongst content creators according to file sharing ranking compiled electronically using technologies for the tracking of downloading trends.[230]

---

[224] Added to legislative action. See Wired 2007 for a discussion on these issues.
[225] The Register 2007: 'HD DVD, Blu-ray copy protection cracked again'. 14th February 2007. Available at http://www.reghardware.co.uk/2007/02/14/aacs_cracked_again/ . It has been argued that the nature of DRM makes them, differently from encryption technologies (where the sender of a message and the party who intends to decipher it are not the same) highly vulnerable to cracking.
[226] In the EMI case the abolition of DRM has been accompanied by a differentiated pricing scheme, DRM-free content being more expensive than DRM-protected content.
[227] The highly restrictive nature of the DRM measures implemented in Windows Vista in order to avoid the reproduction of illegal next generation DVD copies in PCs, which according to some analysts turn the Operating System into a 'suicide bomb' would seem to contravene this trend.
[228] See Rayna, T. and Striukova, L. 2007: 'Digital Rights Management: White Knight or Trojan Horse?' University of Bristol EFM Working Paper series, available at http://www.efm.bris.ac.uk/economics/working_papers/pdffiles/dp07596.pdf for an assessment of the benefit and costs of DRM at the level of the firm, consumer and society at large.
[229] IDG News Service 2007: 'Copying HD DVD and Blu-ray discs may become legal'. 24th May 2007. Available at http://www.macworld.com/news/2007/05/24/copying/index.php?lsrc=mwrss
[230] Such tracking activities are already being carried out by companies such as Big Champagne or BayTSP. See The Register 2006: 'Blanket digital licence fails in France' 14th March 2006. Available at http://www.theregister.co.uk/2006/03/14/france_p2p_plan_fails/ for a discussion regarding the debate on the issue in France.

Another area where the issue of control is being addressed at technology level is that of the uploading of copyrighted content in user-generated repositories such as YouTube and MySpace: right holders' concerns regarding infringements on their copyright have led to the implementation of technologies such as Audible Magic, which is capable of recognising the **digital fingerprint** of copyrighted content and block its uploading. The main shortcoming of this strategy is the possibility of an excessive number of false positives (i.e. non-copyrighted content which is recognised as such by the system) which might alienate these sites' user bases.[231] YouTube's reticence to implement such a system has led to a lawsuit by Viacom which might be essential in determining the institutional arrangements under which responsibility for copyright infringement in user generated repositories will be allocated.

The above attempts to deal with protection of content highlight the weaknesses of the current copyright system, which stems from the analogue world and failed to adapt to the digital paradigm. While new technologies encourage larger audiences to copy, exchange, re-use or mix content, traditional copyrights have become a hindrance to creativity as well as a major source of illegal activities. This reveals the need to move from a "copyright system" to one of "right to copy" that should be as user-friendly as possible, as users seem to engage in illegal activities mainly when they do not find the content they want, the way they want it.

v. Peer-to-peer not only as a threat

Peer-to-Peer technologies (P2P), which have traditionally been blamed for mass piracy by content owners, are slowly being adopted for the distribution of legal content: their main advantage is the leveraging of distributed computing resources, which makes it possible to reduce bandwidth requirements and increase the quality of the services provided.[232] BitTorrent, Joost and Mashbox are three examples of this trend: inasmuch the content being made available through them is a stream, or protected by DRM, there is no reason why these systems should not be able to provide efficient content distribution services for a diversity of purposes without the need for right owners to relinquish control over it.[233]

P2P strategies could also be adopted in order to address the scalability problems faced by MMORPGs and virtual worlds such as Second Life, which tend to suffer important decreases in graphical quality and speed when large numbers of users concentrate in specific locations (equated with servers in their ICT infrastructure):[234] the main obstacle to the implementation of these technologies is that, again, they would imply a loss of control over the platform by its original owners, and shrink the revenues obtained through the rental of centralised server space ('virtual real state') to users. It has been suggested that the owners of these platforms should, nevertheless, accept the need to implement these technologies and shift their business model to one where subscription revenues would be complemented with fees charged for assessing the compliance of new providers of server space with the technical requirements of the platform. This may lead to the emergence of virtual world systems organised along

---

[231] For example, Youtube has already argued that the implementation of such a system cannot be automated and would require the participation of content owners themselves in the verification of copyright infringements by owners.

[232] They present the added advantage of creating linkages between users by incorporating social networking features which facilitate the location of relevant content through processes of referral.

[233] For example, Mashbox, a commercial P2P service currently under development, with participation by Universal and EMI, has the goal of facilitating the distribution of music for preview purposes and its eventual purchase, an implicit acceptance of the usefulness of P2P networks for the diffusion and 'discovery' of creative content samples which can afterwards be monetized.

[234] Differently from other creative content goods, the provision of MMORPGs and virtual worlds presents important marginal costs as a consequence of maintenance, congestion, community management and customer services: it has been estimated that while the profit on gross sales on shrink-wrapped games ranges between 65-85%, in their case, it is of 30-50% (EDGE 2003: "*Networking is the Message at GDC*". May 2003)

principles similar to those observed in telephony, with a broad range of competing but connected agents providing communication and data storage services to users. The French project Solipsis is an example of such a decentralised, open Virtual World.

vi.   More than gadgets

In the growingly interconnected environment we have described, hardware devices for content reproduction, be they Television sets, mp3 players, video game consoles or mobile phones should not be conceived as individual gadgets, but as components of technological platforms that integrate digital distribution channels and DRM: convergence has to do with this process of integration, that is, the confluence of different types of media into the same device.

In some cases, such platforms emerge as result of collaboration within industrial networks (e.g. Symbian phones), while in others they are developed by a single company. Apple's iPod/iTunes music store platform or Microsoft Xbox system, which incorporates the Xbox Live platform for online gaming and digital video game distribution and the Xbox and 360 consoles, are examples of the latter. Their success, reinforced by network effects, has given these actors important leverage in their negotiations with content providers and led, especially in the case of Apple, to accusations of anti-competitive behaviour by other hardware providers. This issue gains particular relevance when considering this company's intention to move into the Television and mobile phone markets through two promising products, Apple TV and the iPhone. The AppleTV intends to facilitate the shift of video content purchased via iTunes into the living room through the wireless integration of the Personal Computer (where content is downloaded) and the Apple TV (where it is reproduced), in what constitutes a direct monetization of the Video on Demand model implemented using set-top boxes with Triple Play capabilities by other IPTV companies. The business model could be expected to develop along the lines already observed in the case of music, in other words hard bargaining with providers of content sold at competitive prices with tolerant DRM restrictions, and the bulk of profits obtained via sales of hardware.[235]

The iPhone aims to become, with its innovative user-touch interface and wi-fi capabilities, the definitive portable device for personal communication and reproduction of content including music, images, video and text, as it presents advantages over Smartphones which, in spite of a wide range of features, sometimes have limited user interfaces and screen sizes. Although a repeat of Apple's success in the mp3 player market appears unlikely given the presence of strong competition in mobile markets, the growing adoption of the iPhone could represent a move towards the commoditisation of the services provided by mobile carriers, to which Apple's Steve Jobs has referred to as mere 'orifices' for device manufacturers.

These processes have important implications, inasmuch they are aimed at replacing open, end-to-end flexible structures for the distribution of content and information with proprietary, closed platforms, which can in some cases constrain competition in adjacent markets (e.g. hardware devices, or content). Their main asset lies in their seamless interfaces and standards, which are more difficult and slower to develop through negotiation or in decentralised market processes such as those typical of the Internet (where the emphasis seems to be on the provision of 'Beta' services).[236]

---

[235] It is to be seen whether Apple's success in the music arena will be reproduced in the face of strong competition from other IPTV platforms which include Microsoft's Xbox.

[236] In software development terminology, a service or product is in 'beta' when it is still not ready for market release because of, for example, its unreliability. It has become common for providers of free online platforms and applications to qualify

vii. Digital advertising

Although most of the issues raised throughout our discussions regarding the impact of ICT innovation on content distribution contain references to new business models emerging in the digital content environment, it seems useful and necessary, given its importance, to set aside a special sub-section to assess the area of digital advertisement. It is a growingly important area of a creative sub-sector in its own right and although it has been excluded from the group of sub-sectors we have decided to focus on as a consequence of the special characteristics of its output – an investment good targeted at audiences rather than consumed by them – and its production process – based on campaigns usually aimed at maximum diffusion, we analyse it now as an increasingly important source of revenue for content creators and distributors, as well as a strategy for promotion.

It appears that at this point, the advertising industry is still trying to define a suitable model for the creation of campaigns that integrate the 'real' and 'virtual' environments; currently, they tend to be designed with traditional media (television, newspapers, radio) in mind to be then adapted to the online context, and this limits their success.[237]

The success of Google's Adsense program has shown that targeted advertising tailored to the preferences of users, as elicited through their search patterns, is more efficient and desirable than pop-up adverts employed in the past which can be blocked by Internet browsers. This model has become the main source of revenue for social networking platforms such as MySpace (where the adverts are deployed depending on the tastes of the user, as specified in their personal profile).

Following developments in the adult entertainment industry, the traffic-sharing affiliate program scheme is also becoming growingly adopted. In this model, associated companies – "affiliates" – share online traffic between them, most commonly via click-through banner ads.

Another type of advertising which is becoming a growingly important source of revenues in the video game sector, and particularly in MMORPGs and other online games is that of in-world advertising: in this case, posters and billboards for 'real' products are incorporated into the game world. They can be localised, so adverts relevant to different geographical areas are deployed depending on the localisation of the gamer, and highly dynamic, (i.e. easy to replace). The possibility of aggregating large fragments of audience from different countries that can be targeted using a single platform makes the adoption of in-game advertising highly attractive, particularly for global brands.[238] A variant of this model is based on the creation of 'sponsored video games' or 'advergaming', based on particular brands.[239]

In terms of strategies for promotion of digital content, the use of video sites and filesharing networks for the distribution of content samples, embeddable promotional content and viral marketing strategies which leverage the diffusion potential of the online medium are also being increasingly adopted by creative content companies in order to enhance the visibility of their products.

---

their offerings as 'beta' in order to signal their lack of stability and avoid responsibility in case of technical errors and problems for the users, which in this model could be thought of as testers (in many cases the programs incorporate automated forms for reporting bugs).

[237] Personal communication with Jonathan Sapsed, University of Brighton.
[238] Bartlett, E. Presentation given at the Northern Exposure Games Conference, 10th May 2007, York.
[239] Game Developer 2007: 'the Advent of Advergaming: Blitz Games' Burger King Games', April 2007.

Table 5: Issues, technologies, impacts and sub-sectors in content distribution

Issue	Technologies	Impacts	New Business Models
A Brave New Digital World	CMS, IPTV, DAB, Podcasts, Digital Distribution.	Enhanced possibilities for the digital distribution of goods.	Desintermediation, disaggregation of goods, new business models based on subscriptions, advertisements, virtual markets.
	Micropayments.	Enlarge the market for electronic transactions in specific settings.	
Move it to the Web	Web based applications.	Change in the technological and industrial structure, new possibilities for innovation in devices, growing importance of new actors.	New Business models based on advertisements and subscription.
Making sense of it all	Online resources, folksonomies, search engines, semantic web.	Facilitate the location of relevant content.	Enhance the possibilities of smaller actors with limited promotional budgets.
Controlling Access	DRM, Digital watermarks, outlaw innovations, digital fingerprints.	More liberal definitions of DRM, broader diffusion of digital goods.	Blanket licenses, ancillary revenues, disintermediation.
P2P not only as a threat	Legal P2P downloading and MMORPGs.	New channels and infrastructures for distribution.	Promotional strategies based on samples, MMORPG providers as meta-content creators.
More than gadgets	New Integrated platforms for distribution of digital content.	Seamless experience, audience gatekeepers emerge.	Hardware-sale revenue models, commoditisation of telecom services and content.
Digital Advertising	New forms of advertising in an online content.	More efficient, dynamic advertising.	Increase the importance of advertising as a source of revenue.

c) User interaction

It is important to note, before beginning our discussion on ICT innovation in the area of user interaction that one of its essential characteristics has to do with the ways in which it enhances the creative possibilities of users, in many cases turning them into a content creator of sorts, as we argue when presenting self-publishing tools at the end of the sub-section.

i. Close encounters with the user community

Creative content goods present important social aspects: their inherently symbolic nature opens up important spaces for consumer commentary, reinterpretation and formation of identity. This special characteristic, not so strongly present in other kinds of goods, has led to

the emergence of communities of consumers who engage intensely with creative content goods. An example of these would be the fan sub-cultures of the 1950s, some of the earliest adopters of print media (fanzines), postal and, eventually ICT networks for the purpose of discussing, reviewing, and in some cases, distributing 'amateur content' created by 'fans' themselves. The mass adoption of the Internet has created a fertile ground for the multiplication of such groups and increased the visibility of the most important ones, which in a context of enhanced possibilities for communication, have started establishing close relationships with content providers. These virtual communities of fans have become sources of feedback and ideas, initiators of 'buzz' about new products in broader markets and, sometimes, pools from which content creator actors recruit talent.

The emergence of evolutionary models for the release of content incorporating user feedback would be an example of this trend, growingly common in the video games and television sector: these strategies are based, for the former, on the use of ICT infrastructures for the distribution of 'fragments' of content (e.g. game levels) into the community, whose members may adopt the role of 'beta-testers' or co-developers, providing content creators with feedback, information about problems using Customer Relationship Management and bug tracking tools such as those mentioned earlier (see *a) Content creation*). In other occasions, these strategies are implemented in a more limited way, for example through the creation of less sophisticated channels for interaction between both content creators and user communities, such as online forums.

In addition to establishing new channels for the introduction of customer feedback into the content creation process, these evolutionary strategies make it possible for companies to turn what used to be discrete products with a limited shelf-life into continuous streams of services through, for example, the release of core functionalities and extensions that can be purchased at a premium price, or subscribed to (a strategy adopted by Bungie with its Oblivion video game). This development contributes, to an extent, to reduce the risks of content creation and publication by decreasing the initial investment necessary for the creation of the 'master copy' of a good and enabling the tweaking of its features in response to demand. On the other hand, it may decrease the satisfaction of customers who expect a finished, complete and bug-free experience when they purchase a creative content good.[240]

The interaction between content creators and communities of users is not bereft of tensions, as users might appropriate and modify resources in ways which may be perceived by creators as infringing their intellectual property rights. The need to approach these issues strategically (since, for example, a lawsuit against a fan might result in customer backlash) has led to the implementation of growingly sophisticated functions for community management and the establishment of digital promotion positions in companies' structures.

ii. User bazaars

In addition to channels for the exchange of information and institutional development which lead to the emergence of virtual communities of users, ICT platforms also enable individuals to engage in commercial transactions through a decentralised bazaar model better exemplified by eBay. Although creative content goods constitute an important area of exchange in eBay, the 'collector' nature of most of the goods exchanged limits the site's impact on the creative content sub-sector. However it might be argued that in some cases it may contribute to reduce sales and revenues for content creators, as any other second-hand market. On the other hand,

---

[240] EDGE 2007 'What's in a Game?'. March issue 2007.

eBay provides these actors with a standardised platform for e-commerce (including management of reputation), and more and more content creators have started setting up stores in the site. Again, this strategy facilitates the creation of direct linkages with customers outside traditional distribution chains, but appears limited by eBay's primitive search interface and the lack of personalisation options in seller's pages, both of which make it difficult to differentiate content creators' offerings. Xbox Live marketplace, which enables exchanges of content created by users, is an example of a similar structure which promotes the creation and diffusion of complementary assets that increase the attractiveness of Microsoft's video gaming platform.

The emergence of Virtual worlds, such as Second Life, where users are provided with content production tools and scripting languages, and means to exchange the virtual goods they create (through the establishment of in-world currencies and markets) constitutes, from the point of view of this Discussion Paper, a more interesting development, as it enables the implementation of highly innovative IPR configurations and business models, characterised by the transformation of users into content creators and of platform providers into meta-content providers (their role being to build and maintain a socio-technical infrastructure capable of supporting user activities, in an effort that growingly turns them into service providers).[241] The sources of revenue in this model are diverse, and include payments for data storage (Second Life), in-game advertising (Ultima Online) and fees on transactions between users (Everquest).

iii. The self-publishing paradigm

We have already discussed the role that weblogs and other self-publishing technologies fulfil as tools for content browsing and filtering, i.e. as sources of information about the quality of creative content goods which facilitate their location by customers. In addition to this function, they can also be used by individuals in order to create content, such as novels serialised as instalments in a blog, or chapters in a user-generated video repository. This development blurs the barriers between content creator and user, as part of a process which might require a re-conceptualisation of the nature of authorship, moving away from definitions based on publication to more tolerant ones which characterise it in terms of the presence of an audience.[242] In addition to opening up avenues for the identification of talent, the use of these tools might lead to the materialisation of new business models for content creation based on, for example, advertisement, donations, subscription fees, the sale of ancillary products (e.g. merchandising), or the creation of new revenue streams for the content creators in terms of, for instance, talks and conferences.

---

[241] The political processes through which rules and criteria for participation in these worlds are established should not be overlooked. See Mateos-Garcia, J. and Steinmueller: 2006: 'Open, but how Much?'. Presented at DIME Conference on Communities of Practice, Durham 2006.

[242] Hjort-Andersen, C. 2000: 'A Model of the Danish Book Market'. Journal of Cultural Studies Vol. 24 Issue 1.

Table 6: Issues, technologies, impacts and sub-sectors in user interaction

Issue	Technologies	Impacts	New Business Models
Close Encounters with the user community	CMR, virtual community tools.	Improve feedback loops, use of communities as pools of talent and for content promotion.	Evolutionary releases, co-development of content, subscription to streams of content.
User Bazaars	User generated content and virtual markets.	Customers fill their virtual worlds with content.	Platform owners provide services, subscription, advertisement supported, transaction fees and virtual markets.
Self-publishing paradigm	Self-publishing tools.	Customers become content creators through new publishing models, redefinition of authorship.	Advertisement and donation supported, sale of ancillary products, economics of reputation.

d)   Summary of the impact of ICT innovation in the steps of the creative content value chain

In this section we have examined the value chain linking creation, distribution and use. A conspicuous feature of this discussion is the extent to which individual users are being empowered as creators and distributors of content as the result of technological change. Even more significant, however, is the role of these developments in transforming the user from member of a passive audience for creative content to a new set of roles, many of which challenge the existing vocabulary. Users are not only co-producers of content, they are coming to play a much more active role in the selection, editing, re-combination, and referencing of creative content. Users are becoming synoptic editors of their own access to creative content, evolving from the 'bookmark' era in which the location of individual web sites was saved for future reference to an era where many of them are making active commentary and collection of content in ways that might better be described as constructing personal libraries or museums of creative content. Correspondingly, these activities are being conducted increasingly in spaces shared with other users. The social nature of these activities provides further enhancement of the value and incentive to participate in producing, collecting, annotating, promoting, editing, and presenting creative content.

This explosion of user-centred activity exists in an uneasy symbiosis with more traditional models of creative content publication and distribution. Much of what a user references or comments may in fact be the 'property' of others. When these user activities are extended to collection and re-distribution of content, there are often in direct conflict with the intellectual property business model of creative content production and distribution. Revisions of the intellectual property-based business models are clearly underway in the form of improved access to pay-to-view and pay-to-own models of distribution as well as accommodations to user interest in being able to transfer material between platforms. These revisions significantly extend what users can do in their own digital spaces but largely ignore the interest of users in sharing and exchanging that appear to be an equally important feature of

recent developments. One consequence is that users have begun to shift their attention to sources of creative content that are not encumbered by restrictions with regard to sharing, editing, and re-compilation. This may serve to reduce the audience for commercially published creative content and highlights the need for publishers to consider either further accommodations to traditional practice or radically new models for extracting value from their creative content assets.

For those engaged in creating content, these developments present a dilemma. It is not obvious, for example, that there is a single ruler by which to measure the quality of creative content that would assure that 'professional' production – i.e. production within the traditional publishing model – will prevail over the proliferation of content produced by actors with a much more heterogeneous range of motivations. One can imagine, for example, that a highly skilled creative artist such as a musician might choose to use the new capabilities for building audiences for live performances and other activities capable of producing revenue, eschewing entirely the publish-for-profit model of engaging in 'professional' activity. Correspondingly, the processes of reference and promotion empowered by new technologies may create reputation and audience for the creative content of those to whom revenue is not an objective at all. In short, technological developments have significantly altered the competitive dynamics of creative content industries. More traditional models are being disrupted, not only by the most publicised of challenges, the infringement of copyright, but also by the interests of users in creating and distributing content as a social activity, capabilities which the new technologies empower and which users apparently welcome as an alternative to existing models of creative content production and distribution.

2.3   ICT AND CREATIVE CONTENT SUB-SECTORS IN THE EUROPEAN CONTEXT

Having described a wide array of technological trends and their implications on processes of creative content production, creative content distribution and user interaction, highlighted their impacts on market structures and signalled new emergent business models linked to their broad adoption, we focus on the specific situation of the Book, Music, Audiovisual, Video Games and Cultural Spaces sub-sectors, describing future instances of development based on the evidence we have compiled, and highlighting their implication for the European sub-sector. The discussion below is necessarily speculative, and it should be read with caution: the Creative Content sector finds itself at a crossroad, with powerful players pushing in different directions. In our analysis we make assumptions, in some cases, regarding the outcome of these complex markets interactions, pointing out possible, not necessarily unlikely, paths of divergence whenever relevant. We also describe some emerging models for content creation, content distribution and user interaction enabled by ICT innovation in the 'Promising developments' boxes.

Although our analysis focuses on what could be conceived as 'technology push' factors, relevant inasmuch many of the technologies and new models we are describing are being introduced in the market in condition of uncertainty regarding the reaction of customers, it is essential to point out that it is precisely that reaction, favourable or else, which will determine the eventual outcome of these processes - we concentrate on these demand issues in Discussion Paper 3.

2.3.1. The evolution of the book sub-sector

a)   Key dynamics

The book sub-sector appears to be, of all the ones we have considered, the one where the impact of ICT innovation has been less significant. This is a consequence of the prevalence of the traditional book format over alternative platforms for digital distribution and reproduction, whose adoption has been hindered by the absence of suitable technologies and uncertainty regarding standards for reproduction and DRM. On the other hand, the adoption of online distribution strategies has been particularly successful in the sector, and the prevalence of Amazon.com constitutes one of the first manifestations of the 'long tail' phenomenon.

We highlight now some key dynamics characterising its future evolution:

- **Prospects for survival of the small bookstore**: processes of consolidation in book retail, integration of ICT infrastructures for distribution which require important investments in technology, and competition from online book-stores in the provision of titles for niche markets at cheap prices would seem to point towards a difficult future for those small independent 'brick and mortar' bookstores that are not tightly integrated in the fabric of their cities or do not emphasise the social aspects of book consumption (providing highly personalised services to their customers or creating social spaces that enhance the 'book-shopping experience'). We expect to see a movement towards the online environment as these actors start becoming 'click and mortar' stores with an online presence which makes it possible for them to make their inventories accessible online. This strategy is becoming more viable as flexible content and transaction management systems gain sophistication and acceptance. Those bookshops able to provide specialised services catering to niche demand and incorporating elements of content filtering and classification (limited in the case of larger e-bookstores which emphasise a standardised user experience) and online publishers (with a constrained inventory) could be expected to thrive in the online context,[243] in some cases benefiting from the creation of online communities of users.

  At this point it appears unlikely that developments in digital printing and automated binding will enable these smaller actors to provide their customers with instant, cost-effective on-the-spot print on demand services bypassing those physical constraints in shelf space that limit the scope of their inventory.

- **Online bookstores**: the growing concentration in retail favours large publishers who are able to implement automated distribution chains and comply with retail chains' stringent return and pricing policies, and constrains the diversity of supply in brick and mortar bookstores. This concentration combined with the broader availability of tools for web design, content management, e-commerce and user interaction will lead smaller independent publishers to establish an online presence, selling their titles directly through the Internet, and in some cases even adopting a subscription model for loyal consumers. Their success depends on the extent to which they are able to provide their users with personalised services (in terms of searching, sampling and recommendation systems), and facilitate the emergence of highly engaged

---

[243]   In a way they would adopt the structure of internet portals for access to thematic resources in text form, with the option of purchasing books from their inventories.

communities of consumers, in order to promote sustained interactions and brand loyalty.[244]

An alternative system for online distribution of books is based on the emergence of platforms for match-making/brokerage providing bookshops with the necessary tools and resources to engage in book e-commerce activities without the need to undertake high investments in infrastructure or skills, either as specialised actors or networks of publishers sharing the same technological platform. Canadian company ABE books, a successful example of the implementation of this strategy is described in the 'Promising developments' box at the end of this section.

- **Digitisation:**[245] e-Books uptake has been hindered by a network effects 'chicken-and-egg' problem: the absence of DRM and reader software standards has fragmented the market for devices and created uncertainty among publishers, who either lack incentives for the creation of inventories of digital books, or establish infrastructures for their online distribution, which reciprocally diminishes the prospects for hardware development.[246] However, we observe a number of developments which might bring forward a change in this situation:

  o **Google books**: Google has recently launched an online service that makes it possible for users to search for books that can then be browsed in PDF format and, in some cases printed. This service also provides links to publishers and a limited number of affiliated (mostly large) online bookshops from which physical copies of a book can be purchased. The business model for this service is based on targeted advertising and fees on transactions (in this sense Google would be providing a match-making service along the lines of ABE books, although with a more constrained range of available sources for purchase).

    Perhaps more interestingly, Google's effort at digitisation is bringing forth the accumulation of a large stock of PDF e-Books that could be made available for download once a revenue-sharing agreement with publishers is reached:[247] in this scenario, Google Books would become a 'book iTunes', although with open standards for reproduction and DRM (which would reinforce competition in the device market).

  o **Reader devices and e-ink**: The growing market adoption of multi-purpose consumer electronic goods such as smartphones and tablet PCs, and the future launch of Apple's iPhone is creating an environment populated by devices with large, high quality displays and online connectivity, two essential features which make them particularly suitable for accessing and reproducing e-Books.

    Electronic paper (also referred to as 'e-ink') is another technology currently under development which presents a strong potential for digital text reproduction, and its

---

[244] Czech publisher Grada constitutes an example of the successful implementation of such strategies. See EC 2005a: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- Key Issues and Case Studies". Brussels: European Commission.

[245] See Herbshberg, H. 2004: 'Gutenberg going Digital'. Available at http://islab.oregonstate.edu/koc/ece399/f03/explo/hershberg.pdf for a discussion of some technologies and issues related to the introduction of eBooks and e-ink in the market.

[246] TENIA Consortium 2002: "The emergence of New Industrial Activities: Fusing Services and Manufacture (Conceptual Framework)".

[247] The Register 2007: 'From Gutenberg to Google' 25/2/2007. Available at http://www.theregister.co.uk/2007/02/25/google_gutenberg/

potential introduction has been tested by several publishers, including Flemish newspaper De Tijd.[248] Although electronic paper presents certain advantages over other hardware for the reproduction of e-Books (such as its closer resemblance to the traditional book and newspaper format), its single-purpose nature might constrain its uptake to dedicated subscription services (e.g. an electronic paper with daily news updates downloaded via wi-fi).[249]

The mass adoption of e-books would reduce the need for printing and physical distribution of content, and make it possible for authors to establish direct linkages with their readers without the need to resort to publishers, distributors or retailers. The extent to which this model would be commercially sustainable in the case of most authors appears uncertain, given the likely surge in the number of digital books, and the problems customers would have appraising their quality:[250] it is likely that literary agents and publishing firms whose functions include not only promotion, but also manuscript selection and quality assurance would remain essential players in the sub-sector.

- **Audiobooks:** spoken word audio constitutes another thriving format for the digital distribution of books, given the widespread availability of reproduction devices and online music stores. We expect rapid growth in the area as publishers start incorporating (or outsourcing) functions for the adaptation of their content to this new format into their editorial processes. The development of sophisticated voice recognition and synthesis technologies which facilitate the automation of 'book recording' processes will increase the speed and cost-efficiency of Audiobook creation, and open up great possibilities for the transformation of valuable back-catalogues into this format.

b)   Implications for the European book sub-sector

Innovation in ICT will contribute driving the activities of the book sub-sector towards the online environment. Although at this point the emphasis lies on e-commerce of physical books rather than on the digital distribution of e-Books, the uptake of Google Books and its eventual transformation into an e-Book downloading service, and the increasing adoption of suitable hardware devices for e-Book reproduction might change this situation.

The implications of these processes for the European book sub-sector are very important. First of all, digital distribution makes it possible for authors and small publishers to reach readers bypassing distribution and retail bottlenecks which favour larger publishers, and might contribute to sustain or even enhance the diversity of the European publishing environment. It may also improve new authors' possibilities to access markets as digital printing increases the flexibility of the publication process, and diminishes costs and risks. However the absence of suitable filtering and searching technologies, and the relative unpopularity of book e-commerce in most of Europe (with the exception of the United Kingdom) might limit the success of smaller bookshops and publishers who decide to move online without the sufficient resources to invest in promotion. Content portals and virtual communities which provide information and reviews about books constitute basic channels that enhance the extent to which these actors might reach readers (or conversely, of their readers finding them), and

---

[248]   The Register 2005: 'Tomorrow's Paper will be Digital'. Available at
        http://www.theregister.co.uk/2005/12/21/electronic_paper/
[249]   The dedicated nature of this technology might be seen as an advantage in certain areas.
[250]   In a way, e-Books would become 'vanity press' for the masses in the same way as many weblogs already have.

their emergence should be facilitated, by providing users with suitable tools, platforms and incentives.

In the context described previously, the survival of small independent bookshops which do not provide their customers with high value-added personalised services, establish an online presence or increase their responsiveness to demand by implementing automated systems for interaction with distributors is threatened.

Promising developments – ABE Books, online aggregation of bookstores

Canadian online bookstore ABE has created an alternative platform for book e-commerce based on the provision of intermediary services between bookshops and customers. Differently from Amazon.com, which incorporates third-party offerings into its own infrastructure with very limited possibilities for personalisation and browsing of inventories, ABE can be seen as an enabler, providing bookshops with their own individual sites and tools for cataloguing content: the business model adopted by ABE Books is based on monthly subscription fees for member bookshops, and a fee on transactions.

Another advantage of ABE Books over Amazon is its specific focus on books, with search and indexing tools based on standard information items such as author, title or ISBN number, not adopted in the latter case because of the presence of other categories of goods such as perfumes or consumer electronics in its inventories, which do not conform with these meta-data categories.

2.3.2. The evolution of the music sub-sector

a)   Key dynamics

Together with video games, music is the Creative Content sub-sector where ICT innovation has caused a stronger impact, in some cases of a traumatic nature,[251] given the ways in which it has challenged traditional distribution and promotion models. We highlight now the effect of some of the essential developments currently unfolding in the area, taking into account the possibilities of different future situations, whose shape will be determined by technological, market, political and legal processes currently under way:

- **The DRM controversy**: there is a strong controversy in the sub-sector regarding the role played by DRM measures, the extent to which their stringency has led to the emergence of illegal models for the digital distribution of music, and their impact on the levels of competitiveness in the hardware device market.[252]   There are two potential future situations for DRM in addition to the status quo characterised by DRM standard fragmentation and market dominance by the iPod/iTunes Music Store as outlined now:

  o **Open DRM**: one scenario is linked to the aperture of Apple's dominant DRM FairPlay standard specifications to competitors. This situation would increase competition in the hardware device market by making it possible to reproduce music purchased in the iTunes music store in other mp3 players besides the iPod and benefit large record companies by diminishing their reliance on Apple's

---

[251]   The more incremental nature of the impact of ICT innovation on video games, and the smaller size of large incumbents who have found their position threatened by it has reduced the perception of earth-shattering change in this sub-sector.

[252]   See Rayna, T. and Striukova, L. 2007. Op. cit. p. 31.

platform and strengthening their bargaining position when setting prices and conditions for downloads (e.g. in terms of content aggregation).[253] Even if Apple decided to open its standards, the market would still remain in a state of fragmentation, as other strong players such as Microsoft and RealMedia have their own proprietary standards.

o **No DRM**: abolishing DRM, as Apple's Steve Jobs proposed in a recently published white paper[254] would weaken Apple's dominance over the digital music distribution market. Nevertheless, the situation of the company would probably not be harmed in this new context, inasmuch its main source of revenue, hardware sales, would be strengthened by the likely surges in digital music consumption:[255] the growth of the overall market would probably compensate for decreases in Apple's market share. In any case, it could be expected that, even in this new open milieu, the iTunes Music Store would remain the platform of choice for digital music consumers given its seamless integration with the dominant mp3 music player, Apple's iPod.

DRM could be replaced with other technologies to maintain control over copyrighted content, such as digital watermarking, and complemented with strategies of collaboration between music companies and Internet Service Providers aimed at identifying individuals who carry out illicit file-sharing activities on a large scale. It seems likely, however, that the effects of these technological and legal measures, often unsuccessful in the past, would be limited compared to the substitution effect brought forward by the increased attractiveness of legal downloading of music unencumbered by DRM: creating customer goodwill, rather than hostility through the implementation of measures that are perceived to criminalise fair use, seems a likely strategy for market success.

- **Blanket licence**: the adoption of blanket licence models for the distribution of music goods (analogous to those currently in use in commercial radio and music venues) would have a tremendous impact on the structure of the sector. In such models, file-sharers would pay a periodic fee directed to a common pool which would then be distributed between content creators and publishers according to a ranking of sharing intensity established by automated monitoring of networks or samples of users (e.g. Nielsen Families). The legalisation of file-sharing would remove any sort of constraints over the distribution of music content, to be carried out by consumers themselves. The role of publishers, in this new situation, would consist at most in funding content creation in order to acquire rights over it, and then promoting that content in order to boost its diffusion and the ensuing revenues.

Needless to say, the business model of Music e-stores would be shattered, and the latter would probably be replaced by online guides and virtual communities for the filtering and classification of content described earlier (see 'Making Sense of it All' sub-section).[256] It should be highlighted that the adoption of this alternative faces important technical and political obstacles. The former have to do with the need to

---

[253] Currently, the digital distribution model follows an oligopsonic model with one player (Apple) being able to impose its terms (regarding pricing, DRM and other conditions) on rights owners.

[254] Jobs, S. 2007: 'Thoughts on Music'. Available at http://www.apple.com/hotnews/thoughtsonmusic/

[255] It is important to bear in mind that the iPod dominated the mp3 player market long before the advent of the iTunes music store.

[256] The emergence of communities and sites specialised in the provision of high-quality downloading services, in some cases under subscription, appears as a potential development in this scenario.

create suitable tools for the collection of large amounts of data regarding file-sharing trends and to channel revenues from the blanket licence pool to artists and publishers, while the latter is linked to strong opposition to such an initiative from large publishers which, in this new state of affairs would lose their position of dominance over music distribution.

- **Radio on demand and its role on content filtering and promotion**: Radio on Demand sites such as LastFM (see 'Promising development' box below), Pandora or MySpace (and, to an extent, networks of mp3 blogs) have become important tools for the promotion of music content in a stream format: they implement features for content browsing, filtering and discovery based on a diversity of methodologies (analysis of content structure in Pandora, reputation and references in the MySpace). Although both services are advertisement-supported (in the case of Pandora there is also the option for users to pay a subscription fee in order to enjoy an ad-free experience), the nature of their interaction with content creators is different: while Pandora pays content creators licence fees, MySpace provides them with enhanced visibility and free storage space for music samples.

  These platforms can help artists raise their profile and promote their products without the need to resort to marketing services of music publishers: everyone is allocated the same space and visibility regardless of past commercial success or marketing budget (admittedly, bands can advertise in MySpace's front page). As such they contribute to 'democratise the spotlight' as they replace top-down radio broadcasting systems (in some cases biased by 'Payola'[257] practices) with bottom-up content discovery models which increase consumer choice and the possibilities of smaller actors (see MySpace's download services for unsigned bands, described in the 'Promising development' box below, for an example of the monetization of such visibility).

  The recent developments in the US, where royalties for webcasters have been tripled as of July 2007 with retroactive effect may well lead to the closure of many web radio sites. In addition, a fee to be charged per channel directly threatens the nascent Radio on Demand industry, whose business model is based on the provision of customised channels. Traditional radio broadcasters in the US which have benefited from a 1909 law exempting them from paying full royalties may also be subject to similar measures. Those could well have adverse effects as listeners often discover music on the radio before buying a number. However through increased royalties the music industry hopes to compensate for declining music sales revenues.

---

[257] Payola is the purchase of broadcaster's airtime in exchange for money or gifts, see Houston Chronicle 2007: 'Stations agree on anti-payola settlement' 7th March 2007. Available at
http://www.chron.com/disp/story.mpl/ap/business/4603527.html

<div style="border: 1px solid gray; padding: 10px;">

Promising developments – Innovation in music community sites- LastFM and Myspace

UK-based radio streaming site, **LastFM** is a radio platform with social networking features which currently boosts 20 million registered users. One of the main examples of what has been termed 'Radio2.0', LastFM enables users to listen to radio streams tailored to their preferences, as elicited from previous listens, to those of other users or communities, as well as to those selected via music tags. In this respect, LastFM makes it possible for users to generate their own playlists and addresses some of the difficulties associated with navigating the large stocks of music content currently available. LastFM is funded via advertising and subscriptions (which gives users access to premium features and services), and pays royalty fees to the artists whose songs are made available in the site.

In addition to increasing the visibility of content creators by providing them with customisable band profile/sites which feature a plug-in player for streaming songs and mp3 storage capabilities, the **Myspace** Social Networking platform is currently developing a functionality that will enable unsigned bands to sell tracks via the site using Snocap technology: the pricing of the tracks will be determined by bands themselves, with Myspace receiving a fee per transaction. At its onset, the main available format will be DRM-free MP3s, although there are plans to eventually incorporate DRM protected tracks from major record companies into the service.

The impact of this development could be considerable, taking into account the population size of MySpace (100 million accounts as of August 2006) and the number of unsigned bands currently registered (3 million): it is important to highlight that MySpace's services would present several advantages over the iTunes Music Store, such as the integration of communication and user community features with downloading services, and pricing discretion for content creators.

</div>

b) Implications for the European music sub-sector

In terms of industrial structure, the new situation in the music sub-sector is characterised by a loss of power by large record companies as ICT innovation makes recording, editing and music distribution more inexpensive, enhancing the competitiveness of smaller, more flexible labels. Older cycles based on the discovery of talent by independent labels, to be then launched into mass markets by majors are starting to give way to a new environment where independents enjoying strong brand recognition are able to retain pop stars in their roosters. The success of European labels such as Domino, who have achieved large-scale success in US music markets by adopting promotion strategies based on social networking sites such as MySpace constitute examples of this trend. In this context, where flexibility, attention to user demand and the provision of specialised services to increasingly empowered artists are becoming essential sources of competitive advantage, we are starting to witness a replacement of large record studio top-down structures for the management of music selection and distribution with more distributed models based on the creation of quasi-independent labels operating with more autonomy as to talent recruitment and promotion techniques.[258] EMI's Island Records success with pop artist Lily Allen constitutes an example of the potential of this approach, in which large mass media conglomerates move towards a model based on the creation of common platforms for the co-ordination of promotion and distribution used by semi-independent publishing units, analogous to the collectives of Independent Record labels which have been in operation since the 1980s.

Although it appears unlikely that, in the new globalised (although not necessarily homogenised) environment, most non-English speaking artists should be able to grow beyond

---

[258] Which, in some cases, would appear to be associated with a management style more concerned with quality than sales.

niche markets outside of their linguistic areas, gaining a foothold in those through online distribution and promotion strategies, there may be opportunities for the development of new revenue streams based on ticket sales from live performances, or sales of merchandise.[259]

The impact of the move towards online distribution in the music retail sector will go along the lines discussed in the book sub-sector, with large retail chains starting to dedicate more shelf space to ancillary products and other creative content goods less readily available online (such as DVDs or video games), and independent stores specialising on niche markets defined by genre or reproduction format (e.g. vinyl).[260]

The impact of the different DRM alternatives discussed above is difficult to estimate, inasmuch the effects of these technologies on music distribution are highly controversial: it appears that the adoption of a blanket licence would be better able to capture the value of different music goods, and benefit consumers by promoting competition in all the areas of the sub-sector, but the implementation of this system faces important technological, political and legal obstacles. Guaranteeing an income for successful content creators through the determination of a suitable file-sharing usage fee, and promoting registration by users constitute additional examples of issues that would need to be resolved in this new scenario (also relevant in the area of digital radio). In any case, there are signals of greater publisher awareness of the problems brought forward by their emphasis on DRM in digital music, as shown by EMI records' recent announcement of its intention to start making DRM-free tracks available for download in iTunes and other online music stores.

The move towards the online medium also creates new opportunities for innovative actors able to provide specialised intermediation services, such as for example MusicBroker.com which provides matchmaking services between a rooster of unsigned artists and entertainment companies whose A&R[261] departments are overstretched by the surge on music content created as a consequence of decreases in production costs.[262]

Finally, the growing uptake of mobile music in Europe should have an important impact in the European sub-sector, creating new revenue channels for music creators and publishers insofar suitable distribution platforms are implemented: this is an area where DRM fragmentation and the strong integration of the iTune Music Store with iPod and iPhone could raise regulatory concerns should Apple attempt to leverage its current dominance over music distribution into the mobile phone market.

2.3.3. The evolution of the audiovisual sub-sector

a)   Key dynamics

The way in which ICT innovation, by alleviating physical (radio spectrum) constraints to content distribution, has impacted the audiovisual sub-sector is difficult to overstate. So far a large number of incumbents have been able to retain their dominant position in the area, through the creation of close ties with content creators (channels), as a consequence of public support and other policies, or because of their ability to adopt and deliver content through new technologies. However the leveraging power of widespread distribution of video content via

---

[259]   These linguistic constraints are not present in musical genres such as Jazz or Classical Music, in any case.

[260]   Another possible strategy that these actors could adopt in order to survive competition from online retail would be the provision of in-store outlets for music downloading

[261]   Artists and Repertoire

[262]   Leyshon, Webb, French and Thrift 2005 'On the Reproduction of the musical economy after the Internet'. Media, Culture and Society, 27.

Internet Protocols, the growing demand for interactive features and on-demand access, and the attempts of hardware providers to become content gatekeepers in the domestic environment might eventually lead to a change in this situation: we examine all these issues now, beginning with the evolution of the film sub-sector.

- **Films as another kind of audiovisual content**: the decreasing importance of theatrical revenues and the growing reliance on other distribution channels such as DVDs,[263] online distribution and especially TV imply a transformation of film studios. These will continue losing their privileged position to become creators of another category of audiovisual content, admittedly endowed with special characteristics and an aura of glamour which in some cases should grant them special conditions in their negotiation with the main distributors (growingly TV channels). The importance of the blockbuster as a source of revenue has declined under the combined effect of the fragmentation of mass audiences, of competition with other types of content, which can be enjoyed in conditions of enhanced 'immersiveness' at home as a consequence of technological innovation, and of a perception of stagnation in the sector (especially in the case of Hollywood major studios). As box office revenues fall, studios become growingly reliant on other distribution channels where they lack the sort of bargaining power they had in the case of theatres. Innovation in digital distribution of feature films to theatres should contribute to reduce this power even further by making it possible for theatres to choose amongst a broader diversity of film content, in some cases placing a premium on quality or customer demand (in some cases generated through word of mouth) over Hollywood-style mass promotion and star-appeal.

  These trends should lead to a decrease in the power of major film studios, which will need to rely on their skills at branding their products as attractive complementary assets for the dominant TV distribution channels.

- **Online distribution of audiovisual content**: the emergence of VOD and digital downloading of audiovisual content (including films) creates new opportunities for smaller, talented players who find themselves in a new environment where global audiences can be reached without resorting to large scale marketing onslaughts. As we have already pointed out this potential will only be fulfilled, given the current abundance of content, through the adoption of innovative promotional approaches tapping into the distributed, networked nature of ICT platforms and virtual communities of fans.[264] YouTube and other user-generated content repositories constitute suitable channels for the implementation of these strategies.

  New online media decrease barriers to entrance in markets and make it possible for new entrants to signal their talent, a potential source of revenue even in the absence of strategies for the direct monetisation of content: the 'music video' model adopted by content creators, with revenue streams generated through the sale of ancillary products or services (e.g. talks, conferences or consultancy), and visibility (in some cases leading to a commercial career) constitute important benefits of widespread distribution for talented, amateur audiovisual content creators, and a source of opportunities for publishers with suitable capacities for content filtering and repackaging (analogous to those already signalled in the case of independent music labels).

---

[263] New York Times 2004: "Box Office in a Box". November 14, 2004.
[264] The Blair Witch Project would constitute an example of the successful adoption of this kind of strategies.

Another area where online distribution is having an important impact is in the technologies used for audiovisual content recording, especially in the case of feature films: in the current circumstances, the distribution of content recorded at high quality (35mm) is still unfeasible, and this is leading to an abandonment of this expensive format in favour of cheaper digital recording techniques with less definition. Although it is to be expected that increases in bandwidth and hardware will eventually make it possible to transmit files of large sizes at rapid speeds, the question that remains is whether the 35mm format will be able to survive until then.[265]

- **Channel on demand**: online distribution of digital content creates new opportunities for customisation of Audiovisual content in packages (satellite/cable/digital model), channels (online subscription exemplified by JOOST, described in further detail in the 'Promising developments' box below) or programs (e.g. the TIVO model). In addition to enabling pay-per-play and subscription revenue models based on customer access to premium services, the disaggregation of audiovisual content facilitates the implementation of highly targeted advertising strategies. By making it possible to gauge the popularity of content with a greater degree of granularity than was possible in the past, it also makes content providers more responsive to customer feedback, and increases the efficiency of their negotiations with content providers.[266]

- **Convergent television**: the iTunes/iPod platform, which relies on the tight integration of hardware and content distribution channels with the goal of creating a seamless user experience, has become a model for actors driving processes of convergence of digital content in the Television. The broad range of technologies being adopted reflects the heterogeneous capabilities and goals of players competing for the position as gatekeepers to the home entertainment arena. In addition to set-top boxes for access to IPTV (and broadband), Wi-Fi TV (based on the use of Wi-Fi enabled television sets), Apple TV and the Xbox dedicated console (soon to incorporate IPTV features) are some examples of solutions for the delivery of creative content goods to customers' homes in a user-friendly way. While IPTV constitutes an example of hardware and software commoditisation, provided by TV networks/platforms as part of their services (which also include VOD), in some cases causing compatibility problems and market fragmentation, other developments should reinforce the importance of hardware providers: (a) the Apple TV – integrated wirelessly with the iTunes store – does so by creating a new wholly internet-based model for access to audiovisual content along the lines of the one currently dominating digital music distribution, (b) the Xbox model is presented briefly in our discussion on the video games sub-sector, in the following sub-section. The outcome of these competitive processes should lead to important reconfigurations in the structure and revenue-sharing models that characterise the sub-sector.[267]

---

[265] One option would be for studios to 'subsidise' the production of ambitious, high quality products for theatrical release with lower definition ones aimed at digital distribution. Personal communication with Daniel Nixon, Pull Back Camera.

[266] As information about customer demand, which in the past had to be estimated through techniques such as Nielsen ratings becomes easier to compile.

[267] As new players acquire dominance over key steps of the value chain, along the lines of recent events in the area of digital music distribution.

> **Promising developments – P2P VOD: Joost**
>
> Joost is a new VOD initiative currently on Beta Testing: its main potential advantage over its competitors (such as YouTube or MySpace video) is the use of P2P technologies for content delivery, which turns each participant in the platform into a source of content and makes it possible to deliver higher quality (DVD quality) audiovisual goods at a fast speed, reducing problems caused by network congestion. Nevertheless, the need to make sure all content remains available regardless of the number of users connected will make it necessary for the platform to keep a 'server farm'.
>
> Joost provides users with the necessary tools to create their own collections of Television channels, as well as features for the uploading of programmes, potentially empowering anyone to become a 'TV station'. The integration of digital fingerprint technologies to prevent the uploading of copyrighted content has created interest in the use of the platforms by major producers such as Viacom.
>
> Joost also incorporates social network features such as chat or messaging.
>
> Joost's business model is based on revenues from targeted advertising enabled by the customisable nature of the service, and the 'storage subsidy' provided by users whose hardware becomes part of the platform's distribution structure.

- **Digital Rights Management**: differently from other creative content goods (particularly music), the marginal utility derived from the repeated consumption of a unit of audiovisual content is relatively small for most consumers. This, together with their limited granularity (imposed by formal- narrative- issues and economies of scale in their creation) limits the beneficial 'discovery effects' observed in music file-sharing:[268] while in the latter sub-sector the sampling of a song by an artist might lead a user to purchase a legal copy (as she perhaps would like to listen it again in a higher quality format), it is unlikely to be the same with audiovisual content (particularly films), especially as distribution of higher quality digital copies becomes easier. As growing bandwidth and storage capacity increase the efficiency and speed of audiovisual content digital transmission, the threat of piracy and file-sharing for the sector will become even more important than it is now. There are a number of technological strategies that have been adopted in order to address this issue, so far with limited success:

  o **Next generation DVD DRM**: the recent cracking of the supposedly secure copy-protection measures protecting next generation DVD HD DVD and Blu-Ray shows the limitations of DRM as a way to solve the problem of piracy.

  o **Microsoft Vista**: Microsoft's new operating system, Vista, incorporates strong DRM features with the goal of hindering the reproduction of illegal copies of DVDs in PCs. Microsoft has been accused of crippling the functionality of their software through the implementation of these technologies.[269]

It seems that the adoption of watermarking technologies with the goal of identifying the sources of illegal DVDs, and the creation of user-friendly options for legal

---

[268] Oberholzer, F. and Strumpf, K. 2004: 'The Effect of File Sharing on Record Sales: An Empirical Analysis*
[269] Gutmann, P. 2007: 'A Cost Analysis of Windows Vista Content Protection'

downloading of audiovisual content along the lines of the Netflix model constitute the most promising technological options for film studios.[270]

Publishers and broadcasters have also accused user-generated video collections such as YouTube of facilitating the illegal distribution of audiovisual content, and imposed the implementation of digital fingerprint identification technologies aimed at preventing users from uploading copyrighted clips as part of their negotiations with these sites. It is, at this point, unclear to which extent possibly high ratios of 'false positives' (e.g. occasions when non-copyrighted content is mistakenly recognised as copyrighted by the fingerprinting technology) might alienate user bases and cause migrations to non-protected competitor sites in a process analogous to the one observed when the Napster music site was re-launched. Furthermore, solutions should be sought to deal with rights attached to music in the context of user-created videos, in order to enable that type of content to grow legally.

- **Mobile TV:** Mobile TV uptake has been so far constrained by the lack of suitable portable devices and limitations in mobile phone connectivity. However, it appears that the new generation of smartphones (as well as the iPhone) will make it possible to overcome these limitations with their larger screens, better resolution and wi-fi connectivity. There is a diversity of emerging business structures for the delivery of such services, some of which are based on the integration of mobile TV with other carrier services (such is the case with MobiTV/SprintTV), while others, such as Wi Fi TV, are based on mobile access to online platforms.

  The recent EC Communication on 'Strengthening the Internal Market for Mobile TV'[271] reflects the EC determination in promoting the take-up of mobile TV across the EU. The EC strategy aims at facilitating and speeding up the deployment of mobile TV across Europe, three key success factors having been identified:
  - o *Standards and interoperability*: by raising consensus around a common standard (DVB-H), the EC seeks to reduce market fragmentation.
  - o *Spectrum*: the Communication stresses the need for an EU strategy for the "digital dividend" (spectrum that will be freed up by the switch-off from analogue to digital TV broadcasting).
  - o *Regulatory environment*: the Communication also urges National Regulatory Authorities to adopt "light touch" regulation for this nascent service; the EC will organise an exchange of best practice and provide guidance for a coherent framework for mobile TV authorisation regimes.

b) Implications for the European audiovisual sub-sector

ICT innovation trends are creating important opportunities for smaller European film creators traditionally subject to fierce competition from Hollywood major studios with large promotional budgets and tight control over distribution channels and theatres: the online distribution models make it possible to reach large audiences without a high investment, and are coupled with the adoption of innovative viral and community-led strategies for promotion. The absence of large incumbents with vested interests in retaining excessive degrees of

---

[270] The problems that DRM caused in the legal downloading services provided by Bittorrent Entertainment Network constitute an example of how the adoption of DRM might in some cases hinder the uptake of digital content distribution (Slyck.com 2007: 'Bittorrent DRM troubles').

[271] COM(2007) 409 final of 18 July 2007 available at
http://ec.europa.eu/information_society/policy/ecomm/doc/info_centre/communic_reports/mobile_tv/409_en_original.pdf

control over their copyrighted content through the implementation of stringent DRM measures in digital products, or enforcing inflexible release schedules on theatres creates spaces for the development of platforms for demand-responsive delivery of digital films to domestic environments and theatres: in a way, it could be said that the European film industry has nothing to lose, and much to win from the transition to the new converged, online environment, which is not the case with Hollywood.

ICT innovation also facilitates the creation of more efficient structures for the undertaking of distributed film production activities leveraging resources, capabilities and sources of funding at a European level. The availability of online resources such as Screen Digest, which provides information about pan-European funding opportunities is an example of the sort of initiatives that assist these strategies, which might nevertheless require a re-think in terms of the nature of the content being produced: past projects aimed at creating feature films for pan-European mass markets by tapping into a wide array of sources of talent and adopting the blockbuster financial model have failed to compete with Hollywood's output. It appears that European film-makers should concentrate in what they do best, 'telling good stories', making use of the new collaborative and audience building strategies available in the online environment to increase the range of culturally situated, high quality products.[272]

The European television market is developing at a rapid speed. The key players and platform providers have demonstrated a remarkable flexibility at incorporating new technologies in order to provide their audiences with the latest interactive services enabled by ICT innovation. Differently from the US, satellite and cable providers have been fast at acknowledging the future importance of IPTV, and Triple play services are currently being introduced in all the large European countries:[273] the absence of strong incumbents with large investments in infrastructures and capacities that are being made to an extent obsolete by the new online paradigm, and the entrance of new players (such as Virgin TV in the UK, telecommunication channels providing IPTV in Spain and, more generally Internet Television) favour competitive processes which promote the fast adoption of new technologies. The richness of the European TV market creates important opportunities for innovative producers, who find a broad range of potential distribution channels.

With respect to innovative promotional strategies, European Audiovisual content producers have so far shown, with the exception of 'the Big Brother phenomenon', a relative lack of predisposition to integrate online resources and community building tools into the development and promotion of their TV products.[274]

2.3.4 The evolution of the video game sub-sector

a)   Key dynamics

As we have already discussed, the video game sub-sector is constituted of several markets organised around specific hardware platforms. In this sub-section we focus on specific developments relevant for content creation, content distribution and user interaction which

---

[272] Following the example of Ken Loach or Lars Von Triers. Personal Communication with Daniel Nixon, Pull Back Camera.

[273] Screen Digest, Goldmedia, Rightscom and CMS Hasche Sigle 2006: 'Interactive Content and Convergence- Implications for the European Society'. Brussels: European Commission

[274] This is in part linked to the smaller scale of European audiovisual production, which tends to focus on national markets (reducing the potential size of online fan communities), differently from large and ambitious products created by American actors such as HBO, and aimed at global audiences.

will lead to the dominance of particular industrial structures and business models in each of them.

- **Next generation console platforms**: the technical sophistication of next-generation dedicated consoles has led to increases in the complexity of video game development, and raised the levels of investment required for the creation of products that fulfil their advanced graphical and technical capabilities. As we pointed out in Discussion Paper 1, this has increased the risks of video game publication, resulting in processes of vertical integration, and has led to the adoption of risk-averse release strategies by publishers. Concerns regarding the negative impact that these trends have in the sub-sector's innovativeness have led to the emergence of new models for video game financing which aim at empowering developers and providing them with the resources necessary for the creation of innovative games without the need to conform to market pressures which encourage conservativeness. Examples of these trends include the following:

  o Emergence of independent publishers who let developers maintain control over their Intellectual Property, focussing on distribution and promotion functions.[275]

  o Adoption of new video game development techniques based on Agile and Extreme Programming paradigms.

  o Funding of video game development through venture capital models.[276]

  o Availability of customisable Open Source middleware tools which reduce the risks and costs of development, and new licensing models for proprietary middleware featuring different pricing scales depending on the size of the developer.

  o Emphasis on identifying areas of the development process where valuable Intellectual Property (such as tools and graphical engines) is generated, with the aim of turning its licensing into a source of revenue.

  o New outsourced development models based on small teams focusing on creative activities, concept development and the integration of assets produced by external parties.[277]

- **Online gaming console platforms and convergence**: hardware provider-controlled platforms for online gaming and video game downloads such as Xbox Live, PlayStation (PS) Network or the Wii Virtual Console are becoming growingly important as gateways for access not only to video game content and communities, but also to other kinds of digital content including Television and information resources. These features, particularly important in the case of Microsoft and Sony (whose PS3 console includes a Blu-ray next generation DVD player)[278] have put these players in an advantageous position in the race towards domination over the 'converged' home entertainment portal. In this new situation, they aim at becoming intermediaries between content providers (of which in some cases they are already part e.g. Sony BGM) and consumers, adopting integrated distribution and reproduction structures along the lines of the iTunes/iPod platform. Nevertheless, the success of the Wii console, endowed with less convergent features, and focussing on ease of use through

---

[275] For example, Gamecock games, see Edge 2007; 'Gamecock Games' April 2007.

[276] This process is associated to a growing perception of the importance of the video game sub-sector, and a deeper understanding of its dynamics by forward-looking investors.

[277] Serapian 2006: 'Project Post Mortem: Stubbs the Zombie' Gamasutra, available at http://gamasutra.com/features/20060811/seropian_01.shtml

[278] Once more, free content is used to lure users in a lock-in situation (HDTV, PS3, Blue Ray etc.) with the objective to lower the production costs of hardware.

its innovative wii-mote interface might cast doubts over excessive ambitious plans for definitive home entertainment convergence in a single hardware platform.

- **Digital portals to video games**: broadband penetration has increased the potential for online video game distribution (exemplified by Microsoft Xbox Live and Valve's Steam service) and created opportunities for smaller developers and publishers lacking the sufficient scale to access distribution and retail chains. However, as is the case in other sub-sectors, the avalanche of digital content limits the extent to which these actors can make their activities visible. Video game portals (such as Manifesto Games) have emerged in order to address this problem by carrying out content selection, aggregation and promotion services, and providing users with content searching and filtering features. Their business model is usually based on fees on downloads, or the payment of a subscription fee by featured developers/customers. Their main difference with similar actors in the area of mobile and browser gaming is that they focus on providing 'brokerage' functions and do not engage in video game commissioning, or require the cession of IP by video game developers.

- **Microsoft Vista and PC gaming**: although it has been argued that Microsoft's XNA development platform (which facilitates inexpensive, high quality video game cross-platform development for Xbox and Vista PCs) might contribute to increase the importance of the PC gaming platform, there have also been criticisms about the way in which its security and parental control features might raise barriers to browser and online gaming, and reduce PC backward compatibility with legacy titles.[279]

  Microsoft's eventual goal is to establish a community site in the Xbox Live platform where PC game developers can share and sell video games developed using the XNA platform along the lines of other user-generated content repositories such as YouTube. Such a strategy is likely to have an important impact on the PC gaming sector, creating direct channels for interaction between content creators and users. The success of XNA would also increase Microsoft's power over the PC gaming platform, putting the corporation in a position of platform gatekeeper analogous to that observed with hardware providers in the case of dedicated video game consoles. However it is widely believed that MS is currently losing money on the Xbox.

- **User-generated content trends in video games**: growing broadband penetration has increased the attractiveness of MMORPGs and Virtual Worlds such as Second Life, which have been experimenting with innovative business models based on the provision of maintenance services, incremental content updates to subscribers and digital marketplaces to facilitate exchanges of user-produced content (see the 'Promising development' box below for the Firefly platform, an example of innovation in the area). Although congestion problems caused by large population sizes are being addressed through increases in storage capacities, it seems probable that in the foreseeable future we will witness the emergence of new providers who adopt P2P and open source structures for their distribution such as those described in section 2.2.2. b).

  The user-produced content model is also becoming more important in other platforms such as for example, the PC, where forthcoming game Spore, to be released by leading

---

[279] St. John 2007: 'Vista Calls a Pall on PC Gaming'. Available at http://www.gamasutra.com/php-bin/news_index.php?story=12314

publishers Electronic Arts, will provide users with tools to create their own characters, as well as other assets.[280]

- **Mobile gaming trends**: Hardware improvements in screen size, graphic, data storage and transmission capabilities continue enhancing the attractiveness of portable devices for gaming, as the success of Nintendo DS attests. So far, the success of mobile gaming has remained limited to simple puzzle style games, disappointing the expectations of developers, publishers and mobile carriers. One question raised by these results is the extent to which 'gamers on the move' demand highly immersive, graphically powerful video games (in many cases ported from other platforms as part of channel diversification strategies which leverage available content and technologies in new formats) as opposed to more casual kinds of games such as Brain Age or Nintendogs, highly successful in the Nintendo DS. This trend would seem to open up possibilities for smaller, innovative video game developers who decide to specialise on the creation of new types of video games better suited to the specific characteristics of the mobile platform.[281]

Promising developments – Firefly, a MMORPG Multiverse

The Multiverse Firefly project constitutes an interesting example of the kind of software standardisation (and arguably, commoditisation) process that unfolds as specialised middleware providers emerge in the video game development sector: this company, started by Netscape veterans, has built a MMORPG platform including game engine, content creation suite and initial content templates, which is to be made freely available to affiliated developers, who can then use it to create their own virtual worlds, loosely set within the universe of the Firefly TV Sci-Fi series. A marketplace where specialised developers can exchange the assets they create (including, for example, "models, sounds, AI scripts, user-interface packs…") will also be implemented. The company will also take care of the maintenance of this technical infrastructure, and of the 'distribution' of the available worlds through a searchable index. It will derive revenues from subscription fees paid by gamers to developers.

---

b) Implications for the European video game sub-sector

The move towards the online environment currently underway in the video game sub-sector creates new opportunities for innovative players willing to take risks and explore novel business strategies and models for interaction with their customers. As already mentioned, the European video game development sub-sector has sufficient creativity and talent to thrive in the digital realm, but there are barriers to access related to the high prices of console development kits and increasing development costs, particularly in the promising area of MMORPGs (whose uptake is being constrained by the relatively slow penetration of broadband in European homes).[282] Processes of outsourcing, and public support for the video game industry in other countries (e.g. Canada) have initiated dynamics of delocalisation which according to some commentators are threatening the industrial fabric of the European video game industry.[283] This has created a perceived need for change through the adoption of development models that strengthen the position of creative studios by, for example, ensuring

[280] IGN 2007: 'Will Wright on Designing Spore. Available at http://uk.pc.ign.com/articles/762/762907p1.html
[281] An example of which would be the development of video games that make use of mobile phones digital camera functions, such as Toy Spring's Arcade Reality, available for the Palm Treo.
[282] It is interesting to note that the European leaders in MMORPG and virtual world development (Funcom and Sulake Corporation) are located in the Nordic area, which have the highest broadband penetration rates.
[283] Hasson, F. 2007. Northern Exposure Games Conference, 14th May 2007, York.

the retention of Intellectual property rights over their content and technologies. The use of open source tools for development, innovative arrangements for middleware licensing, new sources of funding and, particularly, the adoption of online distribution models are further means to 'cut the middleman' and achieve better revenue shares for developers and smaller publishers.[284] This is complemented by the creation of a wide array of associations and groups for networking, pooling of resources and lobbying. However, the extent to which these strategies can guarantee the sustainability of the sub-sector appears limited by issues of visibility, which becomes difficult to get in the growingly crowded online environment. As with other sectors, creating innovative high quality products, establishing close linkages with communities of users and adopting viral marketing strategies competing with the heavy marketing campaigns affordable to larger players might contribute to counter these weaknesses. These strategies may even make it possible to increase the incentives for the development of video games products more culturally relevant for the European context (inasmuch most of the supply currently available in the market is produced using US and Japanese settings, narratives and iconographies).

Current business models dominating the area of mobile gaming distribution, where smaller players able to develop innovative, casual games would expect a higher likelihood of market success, seem to be based on the cession of valuable IP to content aggregators, which diminishes their incentives for participation. The biggest barrier for the success of the European video game sub-sector seems to be about access to the resources necessary to participate in fast growing markets controlled by incumbent players (such as console developers and mobile carriers) and dominance by global publishers who have sufficient financial resources to license popular content and promote their products across the board, or acquire the Intellectual Property of smaller studios establishing unfavourable revenue sharing and scheduling conditions.

2.3.5 The Evolution of the cultural spaces sub-sector

Below we summarise some of the main areas where ICT innovation, particularly in the areas of content classification and access, and user interaction, are impacting the Cultural Spaces sub-sector. Innovative trends in the cultural spaces area should be understood within the context of the unfolding of Knowledge Society initiatives where seamless, rapid access to relevant information through ICT-powered infrastructures becomes an essential source of social welfare and economic competitiveness. The role that cultural spaces play in some essential themes within this area (such as for example e-learning, or the implementation of Knowledge initiatives at a local level) should be highlighted:

a)   **Key dynamics**

- **Library 2.0:** the availability of easy to implement, configure and use blog and wiki tools is bringing new opportunities for the creation of new digital infrastructures. This should contribute to enhance the efficiency of cultural spaces and their responsiveness to user demand, and promote the emergence of communities of highly engaged 'virtual patrons'. This trend could be reinforced through the integration of Content Management Systems with supply chains including, for example, second-hand online

---

[284]   Another channel that has started being exploited recently is that of government subsidies to video game development along the lines observed in the film sub-sector, common in France and growingly popular in the Nordic area.

bookstores in the shape of 'virtual catalogues' (a 'public collection' version of the Amazon.com model).[285]

- **Rights management in digital collections**: new online borrowing systems, such as Overdrive Digital Reserve, incorporate features for the management of digital resources and should contribute to allay content owners' concerns regarding the illegal distribution of their copyrighted property. Such systems, in addition to the growing availability of portable hardware devices for the consumption of e-Books, should speed the uptake of digital distribution of content from the catalogues of libraries.

- **Semantic search in catalogues**: the integration of metadata creation protocols in content cataloguing, and innovations in user interfaces taking place within the semantic web research program such as those currently under way as part of the MultimediaN E-Culture project should contribute to address issues in the areas of content browsing and retrieval, which are becoming growingly pressing as multimedia content starts being incorporated into traditionally textual collections.[286] Guaranteeing inter-operability between interfaces being developed in a diversity of institutions appears as an essential issue in this context (see the 'Promising development' box below on project MICHAEL for an example of a pan-European initiative aimed at the creation of a portal for access to a broad range of digital collections using a standardised user interface).

- **E-learning**: new technologies aimed at enhancing the interactivity of virtual and physical exhibits should improve immersiveness, user engagement, and the potential to promote e-learning via online museums and libraries. The areas of didactic video games, virtual reality and interaction between virtual worlds and intelligent spaces (for example, through the use of RFID tagged objects) seem particularly promising in this respect.[287]

Promising developments – Project MICHAEL: a Portal to Digital Collections

MICHAEL (Multi-Lingual Inventory of Cultural Heritage in Europe), a project funded by the EU TEN programme, is an Open Source platform for accessing multimedia digital collections in a diversity of formats (at this moment, MICHAEL can be used to access French, Italian and UK resources). MICHAEL incorporates tools for the creation of digital collections, and a customisable user interface that can be modified making it possible for institutions to adapt it to their specific needs. Another promising feature of MICHAEL is the Application Interface it provides which makes it possible for institutions to integrate its powerful search capabilities into their sites.

MICHAEL also includes tools for the personal management of collections, and the possibility of contributing user stories and reviews about them.

---

[285] Casey, M.E.and Sivastinuk, L. 2006: 'Library 2.0'.
[286] http://e-culture.multimedian.nl
[287] An example of the application of the latter techniques in order to create immersive learning environments is being currently developed in University of Sussex InQbate Creativity Zone.

b)   Implications for the European cultural spaces sub-sector

EU-funded initiatives for the promotion and co-ordination of efforts aimed at the development of standards for digital content access at a European level have had positive results: public support in the area of content indexing, search and retrieval (of which museums and institutions are 'lead users') presents important positive externalities which could potentially diffuse throughout the European creative content sector. Similarly, the drive towards augmenting the availability of e-Books from digital libraries will contribute to speed up the growth rates of the small European market.

The success of the Guggenheim Museum in Bilbao shows how the establishment of an attractive online presence for cultural spaces can create opportunities to generate revenues from tourism at a local level. These institutions can also be integrated further into the cultural fabric of their cities by providing information and resources about other activities, and perhaps even establishing linkages via ICTs with independent bookstores (which as we pointed out are threatened by processes of consolidation in book retail and the growth of e-commerce), which could become content providers for their collections.

3. CONCLUSIONS

In this Discussion Paper we have portrayed a new digital environment characterised by distributed content creation, enhanced access to content and convergence in digital devices, this is, channel diversification (inasmuch 'one content good to one platform' becomes 'many contents to many platforms'). In principle, all these developments seem to create important opportunities for European players who, in the past, have concentrated their activities in national markets, and faced competition from large entertainment conglomerates with the resources necessary to control physical distribution and create mass markets for their products. Recent innovative dynamics in ICT have brought forward an abundance of hardware, bandwidth and, very importantly software, and leveraged the playing field by providing smaller actors with the resources and tools necessary to deliver high quality content to potentially global audiences. Competition between incumbents coming from the hardware, software and telecommunications sectors has enhanced the diversity of distribution channels available, reducing the power of incumbents (broadcasters and publishers) as traditional gatekeepers to the market: in the current situation, there are many gatekeepers, and many roads to reach an audience, and content creators can, to an extent, 'pick and mix'. This process has been reinforced by the emergence of new structures for distribution and content-creation services, based on innovative business models that turn targeted advertising, access to hardware and bandwidth resources, and subscription and transaction fees into essential sources of revenue.

In the current situation, we could say that content and users become 'king' and 'queen', and delivery platforms the 'ring' that binds them together. Their relationship can in some occasions be strained or confused, as shown by the controversies regarding illegal files-sharing and the implementation of DRM measures in new platforms as well as the limitations of current technologies at facilitating efficient matching between content and demand: these tensions reflect the transformations to which creative content industries are being subject as a consequence of ICT innovation. In the previous discussion we have identified some solutions, social and technological, that are currently emerging in order to address them.

It is however important to point out that this environment might be subject to change as competitive dynamics lead to the emergence of dominant platforms for content delivery that are based upon the use of network externalities to build audience as well as upon stronger control of distribution channels and platform architecture with the aim of shaping the audience experience. An example of this is the iTunes/iPod platform. Although these new structures contribute to alleviate some of the usability and content filtering problems present in more decentralised structures and may provide faster growth, they might also constrain competition, with detrimental effects on content diversity and consumer choice.

This suggests three potential future situations. The first is one in which content is controlled by producers who integrate their activities forward into distribution channels (the historical Hollywood model prior to antitrust decisions eliminating block booking of studio output at cinemas). While this model appears only to be of historical interest, it has partially re-emerged in the video game market where platform producers have developed strong ties to content producers. While this is a reversal of roles of content and platform actors, its effects bear some similarity with the historical model. This situation raises greatest concerns concerning the possibility of excluding smaller players because the integrated content-

platform producer may see diversity as 'cannabilising' demand for the producer's own offerings.

A second situation involves content becoming commoditised and accessible inexpensively (the iTunes/iPod model). In this model, the control of the distribution channel and platform architecture provides the sponsor with the ability to capture or appropriate part of the revenue stream that is generated by mass adoption of the platform and use of the distribution channel. In this second case, the control of the channels of distribution reduces the incentives for content creation. Additionally, because the integrated platforms vying for control over access to content are not based in Europe there are risks that the costs of negotiating access may effectively exclude smaller European content producers.

A third situation involves a more heterogeneous collection of platforms linked together with inter-operability standards that empower users to define and control their own experience. This presents a number of disadvantages including the need for users to design their own architectures for acquiring, storing, organising, and transferring content between different and more generic platforms they may own – e.g. generic MP3 players, home stereos, home entertainment systems, and desktop computers. For these users current DRM standards are a major encumbrance and obstacle, not because they are engaged in wholesale piracy of copyrighted material but because the existing DRM standards greatly complicate the distribution of content among devices they may own. This scenario is the most open-ended with regard to smaller producers since the 'channel' for distribution of content is a very generic capacity to enable transfer of content, either entirely non-commercially, within a business model that does not involve direct payment for individual items, or with some form of 'pay to own' business model. The primary disadvantage of this model is its inability to benefit from the 'mass market' dynamics of converged platforms – heterogeneity adds complexity and particularity and thereby increases the problems of navigation and selection. It is therefore less likely to provide as rapid a growth as either of the first two models. In other words, smaller content producers may find themselves with a large share of a smaller pie, a situation they may not prefer to having a smaller share of a much larger pie.

Having concluded our analysis of ICT innovative trends as drivers for change in the creative content sector, we shall focus, in Discussion Paper 3, on market demand drivers and barriers to their implementation: technology availability does not necessarily imply adoption, especially in the current environment of broad choice regarding types of channels for distribution, hardware devices with different features and conditions for access. In order to address this, we shall identify a number of demand factors that might drive or hinder the market uptake of some of the technologies we have presented in this Discussion Paper, using available data and case studies of failed cases of technology introduction that might be attributed to these factors.

Acronyms / Glossary

Acronym/ Term	Description
DAB	Digital Audio Broadcasting
DRM	Digital Rights Management
eBook	Electronic Book
IC	Integrated Circuit
IPTV	Internet Protocol Television
MMORPG	Massive Multi-Player Online Role Playing Game
PDA	Personal Digital Assistant
P2P	Peer-to-Peer
RFID	Radio Frequency Identification
WoW	World of Warcraft

ANNEXES

Questions that might be addressed by a panel of experts

1. Can we expect future 'headsets' for mobile devices to allow users the option of re-connecting with their local environment (e.g. to intelligently monitor, filter, and transmit local sound as well as that coming from the mobile device)?

2. To what extent will mobile users wish to consume audiovisual content on the move?

3. If mobile audiovisual is to become important is it likely to resemble television or to involve different programming and production methods?

4. Will the technological possibility of electronic monitoring of audiences alter the presentation of creative content? If so, how?

5. Will the capabilities of 'intelligent agents' improve sufficiently in the coming decade that users will rely upon them for acquiring and assembling a significant amount of the creative content that they consume?

6. Will speech and language interfaces be improved sufficiently in the next decade that they become a preferred means to interface with electronic devices a) in mobile applications, b) in desktop applications?

7. Five years from now, what share of users will have accumulated and stored a) less than 5 gigabytes or none, b) 25 gigabytes, c) 100 gigabytes, and d) 1 terabyte (1,000 gigabytes) or more creative content in devices that they can directly access (including online storage)?

8. How important is online (accessed using the Internet rather than local area network or personal computer mass storage) likely to be to users five years from now?

9. Will the distribution of copyright information on the Internet continue to be a possible source of civil or criminal liability in five years time a) for individual users not making any revenue through the activity, b) for those making revenue from the activity?

10. When will desktop animation make it possible for users to produce their own dramatic performances? When will this be possible using characters that are difficult to distinguish from human actors?

11. Is the current interest in self-produced audiovisual content likely to be passing 'fad' or 'fashion' and the audience in terms of numbers and viewing time will be dramatically lower in five years time?

12. Is copyright infringement in the soundtracks of user-produced videos likely to create a major conflict in the next one to two years?

13. Does production of creative content by those not expecting direct payment for its use or reproduction constitute a significant threat to the revenues of creative content

publishers who do expect direct payment? If so, share of total 2010 revenues might be diverted by this source alone (neglecting copyright infringement)?

14. Will artificial worlds such as Second Life continue to generate larger 'online economies' which have real monetary value?

15. Are MMORPG likely to continue to be concentrated? Why? Will MMORPG continue to 'scalable' with increased use or will they encounter irremediable congestion effects?

16. Will user creative content endeavours such as Wikipedia be forced to require 'registration' and user authentication to shield them from misuse or attack?

REFERENCES

- **Antikainen, H., K., S. and Vainikainen, S. 2004:** "Three Views on Mobile Cross-Media Entertainment".

- **AUTHENA**: http://authena.org/ (Accessed: 27 February 2007).

- **Bartlett, E. 2007:** Presentation given at the Northern Exposure Games Conference, 10th May 2007, York.

- **Benkler, Y. 2002**: "Coase's Penguin, or Linux and The Nature of the Firm", Yale Law Journal 112 (3).

- **Boehm, B. W. (2006)**: "A View of 20th and 21st Century Software Engineering. ICSE '06," Shanghai, China, available at http://sunset.usc.edu/events/2006/CSSE_Convocation/publications/BoehmViewof20thand21stCenturySE.pdf (accessed 27 February 2007).

- **Casey, M.E.and Sivastinuk, L. 2006:** "Library 2.0".

- **CORBA:** http://corba.org/ (Accessed 27 February 2007)

- **Deloitte 2007**: "Telecommunications Predictions- TMT Trends 2007" Available at http://www.deloitte.com/dtt/cda/doc/content/UK_TMT_Telecoms_Predictions_2007%281%29.pdf)

- **Dosi, G. 1982**: "Technological paradigms and technological trajectories", Research Policy, Vol. 11, No. 3

- **EC 2005a**: "e-Business Watch: Sector Report No. 03-1- ICT and Electronic Business in the Publishing and Printing Industry- Key Issues and Case Studies". Brussels: European Commission.

- **EDGE 2007**: "What's in a Game?" March issue 2007.

- **Edge 2007**: "Gamecock Games" April 2007.

- **EPIS Validation Workshop**, 4th May 2007, IPTS, Seville.

- **Farrell, J. and Klemperer, P. 2006**: "Coordination and Lock-In: Competition with Switching Costs and Network Effects, " http://www.paulklemperer.org/, May 2006, accessed 27 February 2007, forthcoming in M. Armstrong and R. Porter (eds.), *Handbook of Industrial Organization*, Vol 3. North-Holland.

- **Game Developer 2007**: "the Advent of Advergaming: Blitz Games' Burger King Games", April 2007.

- **Gutmann, P. 2007**: "A Cost Analysis of Windows Vista Content Protection"

- **Hasson, F. 2007**: Northern Exposure Games Conference, 14th May 2007, York.

- **Herbshberg, H. 2004**: "Gutenberg going Digital".
Available at http://islab.oregonstate.edu/koc/ece399/f03/explo/hershberg.pdf for a discussion of some technologies and issues related to the introduction of eBooks and e-ink in the market.

- **Hjort-Andersen, C. 2000:** "A Model of the Danish Book Market". Journal of Cultural Studies Vol. 24 Issue 1.

- **Houston Chronicle 2007**: "Stations agree on anti-payola settlement" 7 March 2007. Available at http://www.chron.com/disp/story.mpl/ap/business/4603527.html

- **IBM 2004:** "Media and Entertainment 2010" available at http://www-935.ibm.com/services/us/imc/pdf/ge510-3569-01f-media-2010.pdf

- **IDATE 2007**: "FTTH situation in Europe" Press Release, http://www.europefthcouncil.com/extra/Press_Release/Idate/PR_IDATE_FTTH_CONF_2007.pdf , 7 February 2007, Accessed: 26 February 2007.

- **IDG News Service 2007**: "Copying HD DVD and Blu-ray discs may become legal". 24th May 2007. Available at http://www.macworld.com/news/2007/05/24/copying/index.php?lsrc=mwrss

- **IGN 2007**: "Will Wright on Designing Spore". Available at http://uk.pc.ign.com/articles/762/762907p1.html

- **Jobs, S. 2007:** "Thoughts on Music". Available at http://www.apple.com/hotnews/thoughtsonmusic/

- **Keith, C. 2006**: "Get in the Game: What Others Can Learn From Games Developers". Better Software November 2006.

- **Lerner and Tirole 2002**: "The Simple Economics of Open Source" Journal of Industrial Economics, 52 (June 2002) 197-234 for a discussion of the economics of reputation.

- **Lessig, L. 2002**: "The Future of Ideas", New York: Vintage Books.

- **Leyshon, Webb, French and Thrift 2005:** "On the Reproduction of the musical economy after the Internet". Media, Culture and Society, 27.

- **Mateos-Garcia, J. and Steinmueller, W.E. 2006**: "Open, but how Much? ". Presented at DIME Conference on Communities of Practice, Durham 2006.

- **MultimediaN**: http://e-culture.multimedian.nl

- **New York Times 2004**: "Box Office in a Box". November 14, 2004.

- **Oberholzer, F. and Strumpf, K. 2004**: "The Effect of File Sharing on Record Sales: An Empirical Analysis"

- **OFCOM, UK:** http://www.ofcom.org.uk/research/cm/cm06/overview06/coms/

- **Punie, Y. 2003**: "A social and technological view of Ambient Intelligence in Everyday Life: What bends the trend?" European Media, Technology and Everyday Life Research Network (EMTEL). Seville, Institute for Prospective Technological Studies, Directorate General, Joint Research Centre, European Commission.

- **Rayna, T. and Striukova, L. 2007**: "Digital Rights Management: White Knight or Trojan Horse? " Univesity of Bristol EFM Working Paper series, available at http://www.efm.bris.ac.uk/economics/working_papers/pdffiles/dp07596.pdf for an assessment of the benefit and costs of DRM at the level of the firm, consumer and society at large.

- **Screen Digest, Goldmedia, Rightscom and CMS Hasche Sigle 2006**: "Interactive Content and Convergence- Implications for the European Society". Brussels: European Commission

- **Serapian 2006**: "Project Post Mortem: Stubbs the Zombie" Gamasutra, available at http://gamasutra.com/features/20060811/seropian_01.shtml

- **Simon, H. A. 1971:** "Designing Organizations for an Information-Rich World", in Martin Greenberger, Computers, Communication, and the Public Interest, Baltimore, MD: The Johns Hopkins Pres.

- **Slyck.com 2007:** "Bittorrent DRM troubles".

- **St. John 2007**: "Vista Calls a Pall on PC Gaming". Available at http://www.gamasutra.com/php-bin/news_index.php?story=12314

- **Steinmueller, W.E. and Mansell, R. 2001**: "Mobilizing the Information Society, Strategies for Growth and Opportunity". Oxford: Oxford University Press.

- **Telemedia Magazine, 2006**: "Open Mobile Gaming Comes a Step Closer". Available at http://www.telemediamagazine.com/newsitem.asp?docid=836

- **TENIA Consortium 2002**: "The emergence of New Industrial Activities: Fusing Services and Manufacture (Conceptual Framework) ".

- **The Register 2005:** "Tomorrow's Paper will be Digital". Available at http://www.theregister.co.uk/2005/12/21/electronic_paper/

- **The Register 2006:** "Blanket digital licence fails in France" 14th March 2006. Available at http://www.theregister.co.uk/2006/03/14/france_p2p_plan_fails/ for a discussion regarding the debate on the issue in France.

- **The Register 2007**: "From Gutenberg to Google" 25/2/2007. Available at http://www.theregister.co.uk/2007/02/25/google_gutenberg/

- **The Register 2007:** "HD DVD, Blu-ray copy protection cracked again". 14th February 2007. Available at http://www.reghardware.co.uk/2007/02/14/aacs_cracked_again/ .

- **Von Hippel, E 2005**: "Democratizing Innovation". Downloadable book available at http://web.mit.edu/evhippel/www/democ.htm

- **W3C:** Word Wide Web Consortium http://www.w3.org/2001/sw/ (Accessed 27 February 2007)

Discussion Paper 3:
User/Customer/Social Expectations and New Business Models

EPIS Work Package 2 – Deliverable 2.3

**Administrative Arrangement
30-CE- 0070769/00-29**

IPTS – IS Unit

The following EPIS project partners and ETEPS* members are the authors of this report:

Juan Mateos-Garcia   SPRU - Science and Technology Policy Research   UK
Aldo Geuna   SPRU - Science and Technology Policy Research   UK
W. Edward Steinmueller   SPRU - Science and Technology Policy Research   UK

The following IPTS EPIS Team members have contributed to and edited this report:

Ioannis Maghiros   IPTS, Senior Scientific Officer
Fabienne Abadie   IPTS, Scientific Officer
Corina Pascu   IPTS, Scientific Officer

This is the third discussion paper of a series of three which describe the present status and future trends in the Creative Content sector with the aim to help identifying appropriate strategies to enhance the growth of the sector in the future.

EXECUTIVE SUMMARY

We complement the analysis of current technological and market structures prevalent in the Creative Content Sector, and emerging ICT trends undertaken in Discussion Papers 1 and 2 with a consideration of a broad range of demand issues which will shape the outcome of the competitive and innovative processes currently underway.

Our analysis of demand issues shows how the technological focus of innovative actors sometimes leads to the neglect of essential customer aspirations related to the potential convenient use of available technologies, matters of trust and security, as well as social aspects of content consumption. We describe the importance of some of these factors, and illustrate them using available data from consumer surveys, as well as case studies on failed instances of product introduction which can be attributed to the misalignment between the possibilities created by technology and the actual goals, intentions and perceptions of users.

Some of the key demand issues that emerge are specific to the new platforms on which content is being delivered and the nascent differing patterns of use linked to those platforms. Other demand issues have nevertheless remained constant and are linked to phenomena such as sharing and distributing music as well as social relationships and interactions; the challenge for industry is to recognise and marry these two perspectives. Our analysis also indicates that the increasingly networked nature of the customer base is likely to present a shift in company-customer interactions, from the single unit in a group to a more interconnected sector whose behaviour may not be so easily managed or predicted.

We also present a broad breakdown of user demographics by age and gender and caution that, whilst the behaviour of the former group is interesting, its weight should not be overestimated when trying to predict future patterns of use.

Last but not least we highlight four essential characteristics of the creative content sector that will remain significant no matter which evolutionary path the sector takes: usability, interoperability, communication and attention.

In conclusion we underline the contrast between the relatively stable, unchanging nature of consumer demands and the radical changes brought into the creative content sector by digital technologies as well as the shift towards networked communities whereby people, and especially the younger generations, constantly look for means to maintain social relationships realtime, wherever they are. In this context, customer expectations need to be carefully managed for a company to remain successful and building trust and awareness are part of the equation. While demographics show clear patterns for the younger generations, any extrapolation is fraught with risks, as their attitude may evolve when they become adults. Finally, content is more important to consumers than the technologies to access or use it, and companies should not lose sight of this when defining their strategies and business models.

The above social/societal trends and the way they relate to technology developments provide interesting insight for market players devising business plans but they are equally relevant for policy makers who should take those into account when defining policies in support of the creative content sector development.

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

1.1 BACKGROUND

In Discussion Paper 2, we analysed the impact of ICT innovative trends in the European Creative Content Sector, stating that the widespread availability of ICT tools for the production and distribution of creative content goods brings forward important opportunities for European actors. Access to markets has, in the past, been constrained by the absence of economies of scale linked to market fragmentation along national/linguistic lines, and the control of distribution channels by large entertainment conglomerates. In other words cultural, financial and market factors have traditionally contributed to reducing the potential audiences that could be reached by European creative content goods, compelling their creators to rely on niche and national markets, a somewhat precarious situation. Content creators have also been threatened by processes of concentration in a retail sector where large players tend to focus on products aimed at mass audiences.

The abundance of hardware, software and communication bandwidth associated with the 'ICT revolution' has provided these European actors with new digital tools for the creation of high quality creative content goods, and inexpensive ways of reaching or creating audiences for them. As a result they are less dependent on funds from large publishers and can sustain creative activities through the aggregation of small audiences at a worldwide level (the 'long tail phenomenon'), without having to resort to traditional blockbuster models .The cultural diversity of the European context, which has been perceived as a constraint can now turn into an opportunity, allowing talented creators to fulfil better their aspirations. As shown in Discussion Paper 2, we are now facing a new wave of change with what seems to be the final arrival of digital convergence and the emergence of a new environment in which a wide array of consumer electronics devices start providing convenient access to ICT networks whose distribution potential has largely increased. Those devices either replace the Personal Computer or disguise it by addressing usability issues which, in the past, have limited its success as a "home media centre". This process should in principle enhance opportunities for European creative content actors even further, creating new possibilities for the distribution of their products to large, less digitally literate segments of the population. However, market, technological and demand forces might constrain their widespread adoption, or limit the extent to which smaller creative actors are able to use them in order to reach broader audiences. For example, the integration of distribution channels and reproduction devices following the lines of the Apple iTunes/iPod business model may turn large platform providers into governors of the value chain, constraining competition in adjacent markets, leading to redistribution of revenue shares unfavourable to content creators, or promoting illegal downloading and piracy. Large entertainment conglomerates are also part of this struggle for dominance over the convergent experience, although their insistence on the implementation of stringent Digital Rights Management (DRM) features in their platforms has reduced their success so far.

It is important to note that the outcome of these processes will be determined by the extent to which the competing systems and technologies being implemented are able to address the needs and fulfil the aspirations of consumers. Apple's success for example is a direct consequence of the company's ability to create an attractive and easy to use platform. If this had not been the case, this company would probably not enjoy its current position of dominance over the digital music distribution market. Consumers' decisions will play a

central role in shaping the future of the technological and market environment for Creative Content activities. This is even truer of the current context, where digital channels enable users to articulate and communicate their preferences more easily, or in some cases devise their own solutions, when those offered by the market are unsatisfactory. The emergence of file-sharing networks as an alternative to what are perceived to be overpriced and DRM-crippled legal content distribution channels constitutes an example of this kind of process.[288]

1.2 STRUCTURE OF THIS PAPER

This Discussion Paper therefore describes a number of market demand factors and their potential effect on the adoption of innovative ICT technologies in the Creative Content Sector, paying special attention to its present situation and future evolution in Europe. Our goal is to integrate these issues into our analysis complementing the technological focus which has characterised our research so far. In order to do this, we identify, and to the extent possible, quantify (using available data and brief analyses of technology introduction cases) essential customer attitudes and preferences which will influence the outcome of the market and technological processes that we have discussed in our previous two papers.

In Section 2, we identify key emerging customer demand issues that bear on the outcomes of the processes of technological development and implementation in the Creative Content Sector described in Discussion Paper 2. We assess the relevance of market demand in a number of areas and present available evidence with the goal of mapping existing consumer attitudes, perceptions and aspirations, highlighting areas of conflict and uncertainty, as well as opportunities for European Creative Content actors. The discussion is not structured along sub-sectoral lines because of the cross- cutting nature of many of the issues described. Those have wide-ranging implications which span across different types of content and, in some cases, go beyond the boundaries of the Creative Content sub-sectors. Our focus is instead on consumers, not on sub-sectors and the commercial players who participate in them, although these are present in our discussion as subjects to the influence of the demand factors.

Sub-section 2.1 highlights customer attitudes in respect to technological areas in the Creative Content value chain, identifying the reasons for the importance of these attitudes and illustrating their nature using available data and mini-case studies of product launches whose failure can be attributed to the failure to address customer demand factors. We will, whenever possible, trace the implications of observed demand trends on the adoption of innovative technologies and business models, signalling those sub-sectors for which they are most relevant.

In sub-section 2.2 we focus on demand issues from a gender and age perspective. These two variables are essential to consider in order to understand different patterns of usage and the acceptance of both the creative content products and the channels used in order to distribute them.

In sub-section 2.3 we present four essential characteristics of the creative content sector which will remain, no matter the evolutionary path taken by the sector.

Section 3 presents our conclusions.

---

[288] See The Consumerist 2007: "How I Became a Music Pirate" Published March 20 2007, available at http://consumerist.com/consumer/drm/how-i-became-a-music-pirate-245644.php and Leyden,J. 2007: "DMCA architect lambasts music moguls" Published 26th March 2007 and available at http://www.theregister.co.uk/2007/03/26/dmca_pants/ for two different accounts of the relationship between unavailability of suitable models for legal downloading and the emergence of illicit alternatives.

2. EMERGING ISSUES IN CUSTOMER DEMAND IN THE CREATIVE CONTENT SECTOR

The description of the state of the art of the European Creative Content Sector and the mapping of promising technological trends undertaken in Discussion Papers 1 and 2 has made it possible for us to identify essential demand issues that inform the strategic and innovative decisions of commercial players, and that have, in some cases, been neglected with harmful consequences, such as with fair use and Digital Rights Management tools. These demand issues are analysed below.

2.1 DEMAND ISSUES AT DIFFERENT STEPS OF THE CREATIVE CONTENT VALUE CHAIN

We have adopted the content creation, content distribution and user interaction framework that has structured our previous discussion papers in order to categorise consumer demand issues and locate their significance in the area of the value chain where they are more relevant. For example, customer attitudes to e-commerce and different models of payment are discussed in the area of content distribution as they shape the strategies and business models that can be successfully adopted in order to distribute creative content goods online.

2.1.1. Content creation

This sub-section deals with the areas of customer demand that stem from tools and outputs of content creation activities, as summarised in table 1 below:

Table 1: Content creation issues

Area	Technology	Demand issues	Insight
Content Creation	**Self-publication**	Do consumers trust the quality of self-published content? Are they willing to pay for it?	There might be limited space for the creation of sustainable revenues via self-publication- this area seems more promising in terms of promotion and diffusion of content.
	Content Customisation	To which extent do customers demand flexibility regarding content consumption? What types of content do different kinds of consumers create?	Most customers demand content, this is, utility for technologies, not technologies for themselves.
	Finding Content	Are customers willing to engage in content tagging and classification activities which make it easier to find relevant content in online contents?	Commercial actors should pay attention to their interactions with communities which create information about their products.
	Content Quality, Mobility and Convergence	What type of content do customers want to consume in their mobile devices? To which extent are they willing to pay for content with a degraded quality?	Content snacks well suited to mobile phone capabilities and modes of consumption prevail at the moment. Opportunities exist for actors who create content specifically tailored for these devices, versus multi-channel distribution strategies.
	Mobility and Fashion	Are there trade-offs between convergent features for mobile content consumption and fashion issues related to the appearance and usability of mobile phones?	Fashion issues might limit the adoption of convergent technologies and should be considered as part of the design process.

a) Self-publication

While self-publication by content creators has a long history, the Internet as a means of promoting and distributing self-published content has created a new context in which blogs or direct download of content from creator web-pages or social networking sites such as Myspace are becoming major activities. There are an estimated 70 million blogs currently in operation, with 120,000 new blogs created worldwide each day.[289] As we have already pointed out, these activities constitute an important challenge to traditional industrial structures in the creative content sector, inasmuch they make it possible for creators to establish a direct linkage with their audience without the need to resort to publishers or distributors. There are numerous business models that can be used in order to finance this strategy for content distribution, including donations, pay-per-download, advertisement support or ancillary activities such as the sale of merchandise or complementary services. Additionally, self-published content constitutes a public signal of talent which may lead to a publishing contract, as it demonstrates the existence of an audience for a particular author. There are several examples of blog writers and bands who have adopted self-publication strategies in order to create an audience 'buzz' as the first step towards market success.[290]

The success of this strategy may however be limited by customers' concerns about the quality of self-published content. The publishing process constitutes not only a solution for the problem of creating, distributing and monetising content, but is also perceived as a way of ensuring its quality through editorial review. In some cases, self-publication is seen as a digital equivalent of the 'vanity press model' adopted by authors without the sufficient talent to get published commercially. If these attitudes prevail, self-publishing is unlikely to become a viable strategy for content creation, it will rather constitute a new step in the traditional publication value chain adopted by innovative players in order to identify and recruit talent.

b) Content customisation

As the customer base becomes increasingly knowledgeable it is likely that consumers will demand greater freedom and more control over the content they consume.[291] The emergence of Radio 2.0 platforms which make it possible for users to create their own custom playlists of content constitutes an example of this trend. This presents something of a double-bind for companies. On the one hand, the more user-centric content is generated, the less control producers have over their audiences and the way users behave with regard to reception of content; on the other, an oligopoly of dominant content providers has the potential to hamper cultural diversity across Europe.[292] The reasons why customers do not make use of new delivery platforms for creating and consuming content is not so much that they have no need for them, but that they are not aware of them[293] (this is particularly true of the older generation). There are differences between the types of content created by different generations and their motivations for creating content, an

---

[289] Sifry, D. 2007: "State of the Blogosphere April 2007". Available at http://www.sifry.com/stateoftheliveweb/

[290] Examples of which would be the Arctic Monkeys in the area of pop music, and writers.

[291] IBM Business Consulting Services: "Media and Entertainment 2010". March 20th 2004, available at http://www-935.ibm.com/services/us/index.wss/ibvstudy/imc/a1001755?cntxtId=a1000062

[292] European Commission, 2004: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

[293] Berlecon Research, 2005: "Digital Music Usage and DRM: Results from an European Consumer Survey". Berlin: Berlecon Research. Accenture 2006: "International IPTV Consumer Readiness Survey". Available at https://www.**accenture**.com/NR/rdonlyres/D2632E25-D570-4488-91A3-6709B9745C7C/0/**IPTVsurvey**.pdf

example being that of older creators who are often enthusiastic about sharing pictures with each other.[294]

Unsurprisingly, the content gap between regions in Europe is socio-economic in nature, resulting from social structures and imbalances of pay and equity investments. Not only may the nature and quality of user-generated content vary between regions, so too may its transferability. Whilst customers in post-industrialist countries may pay a lot for gadgets, they may not pay enough for stories, knowledge and insight. Content itself is tied to culture and language - it does not always ship easily, and its reception depends on the nature of the audience and the sharing of skills within the community. This presents business opportunities as most content creators, users or otherwise, have culturally restricted audiences and markets, while marketers of "hardware" technologies have greater prospects through the devices they sell and the promises of instant service delivery onto those devices. The limited success of a number platforms such as iTunes or Amazon.com in mainland Europe may be attributed to their focus on offering content with an Anglo-centric focus, less appealing to populations from other linguistic and cultural areas. This creates opportunities for innovative local providers able and willing to deliver more 'localised' services.

c) Finding content

The growing adoption of self-publishing and digital distribution strategies has lowered the barriers to content production and increased the range of creative content goods available online, in what has, on some occasions, become a flood of content that users find difficult to navigate. As already pointed out, a number of social and technological strategies have emerged in order to address this issue, such as virtual communities providing information about relevant content, or folksonomies which aggregate user assessments to provide rankings of online resources. These are areas where further innovation is likely and the full diversity or value of new methods in this area has not yet been fully realised.

The use of and trust in these different resources should contribute to alleviate content filtering problems, and inform the promotional strategies of content creators who might want to implement specific strategies to manage their interaction with these communities. Another important issue in this context is the trend towards participation in folksonomies, which usually entails the need to tag content: the extent to which users are starting to incorporate tagging patterns into their web navigation behaviour presents important implications for efforts towards the creation of a Semantic Web, with 28% of internet users tagging or categorising content online such as photos, news stories or blog posts.

---

[294] See footnote 292

Mini case - Finding content: Biased reviews in Amazon.com

Amazon.com enables users to post their reviews of books for sale in its site. Although in principle this tool should make it possible for customers to make informed decisions about content, it appears that some writers and publishers abuse it in order to promote their own agendas (this is, emphasise the quality of their own products to the detriment of their competitors). David and Pinch 2006: "Six Degrees of Reputation: The Use and Abuse of Review Recommendation Systems" (available at http:/www.firstmonday.org) analysed reviews for 10.000 Amazon items, 1% of which were duplicated or spurious. This finding constitutes an example of the sort of pressure exerted over tools and communities engaged in content classification and filtering as online channels for distribution become more widely adopted.

d) Content quality, mobility and convergence

Current bandwidth constraints limit the size of the files that can be efficiently transmitted using digital means, with repercussions for the quality of the available digital content (for example, the bit rate per second characteristics of the mp3 standard for music distribution, available standards for the transmission of audiovisual content or the quality of streaming media). Additionally, as a consequence of digital convergence processes, content can be consumed in a wider diversity of devices, some of which do not seem particularly well suited for quality-rich types of media (e.g. music and video in mobile phones and other portable devices). It appears that in the case of music, consumers have voted for convenience instead of quality, as the mass-adoption of the admittedly 'lossy' quality mp3 and mpeg4 formats demonstrate.[295] However, part of this success can be explained by the previous existence of Walkman/Discman products that showed the feasibility of music consumption 'on the move'. In addition the DRM-free nature of these new formats (much of the content encoded in them can be obtained for free through illegal file-sharing networks) puts into question whether consumers will be willing to pay for other kinds of content such as feature-long films or higher end graphics video games in what is perceived to be degraded quality, and only enjoyable in the relatively poor conditions offered by current portable devices. Consumer expectations in this area will determine the composition of the market for mobile content, the devices through which it will be consumed and the business models that support its distribution.

For example current preferences in the area of mobile gaming tend towards casual games with low graphical quality that are consumed as "content snacks" instead of more sophisticated, highly immersive experiences.[296] Similarly, a survey of 22,000 European early adopters of Mobile TV showed that half of them had decided to discontinue their subscription, 24% of them as a consequence of quality and reliability issues.[297] Although the growing availability of hardware devices with high resolution, storage capabilities and screen size might contribute to redress this situation, it appears that consumer expectations and habits might curtail efforts aimed at establishing mobile platforms as a new channel for the diffusion of content created originally for other media: in spite of convergence

---

[295] 40% of UK mobile phone users have a mobile phone, and 31% of US mobile phone owners who also own a dedicated MP3 player device use their phone as their primary music device (M:Metric research results reported by Lim, A 2007: "Crave Talk: Is the mobile phone killing tech? " March 26th 2007. Available at http://crave.cnet.co.uk/mobiles/0,39029453,49288748,00.htm)

[296] Results of Juniper Research reported in The Register 2006: "Casual games' to fuel mobile gaming market" October 6th 2007 available at http://www.theregister.co.uk/2006/10/06/casual_games_fuel_mobile_market/

[297] Mobile Entertainment 2007: "Viewers turned off by mobile TV". February 12th 2007, available at http://www.mobile-ent.biz/news/25663/Viewers-turned-off-by-mobile-TV

consumers are not going to make use of services on their mobile phones in the same way they make use of services via the Internet. In other words, mobile applications will not necessarily make the Internet mobile - this would not only result in an information overload but also in a clash of habits. Instead, customer demand for services comes from the fact that mobile platforms are a portal for convenience.[298] This creates opportunities for actors who decide to specialise in the production of content specifically geared towards the technological capabilities of mobile phones and other handheld devices (e.g. through the implementation of localised features), and take account of the contexts in which those devices are used to consume content. Another example of technology-driven thinking would be the recent report about mobile TV reaching 244 million global users by 2011 which neglects to mention that these figures refer to the sale of "devices with TV capabilities". Whether these features will be used by consumers who in many cases are given the devices for free as part of their mobile contracts depends on a number of factors and particularly, on the availability of suitable content.[299]

e) Mobility and fashion

The relation between customer demand and the social aspects of communication has frequently centred around the idea of problems and needs, and the "user gratification" model built into software.[300] For many users however, the software component of their mobile phones is a secondary consideration to the look and feel of the hardware, a factor that is particularly relevant for the younger end of the customer market (especially teenagers), and female customers. Young people use mobile phones as a way of expressing their sense of self and perceive others through a fashion lens; fashion considerations therefore guide mobile phone behaviour and user communication. The commercial success of the Siemens CL75, the first mobile phone with an attractive pink shell decorated with floral motifs illustrates the fact that attention to design details of phone hardware pays off. In addition to the handsets produced by the dominant suppliers, smaller players have brought products to the market, which allow users to further customise their phone hardware like a fashion accessory; whilst the earlier models were restricted to changeable covers, users can now adorn their phones with stick-on gems and any conceivable type of "charm". The degree of consideration which customers pay to fashion also applies to the point in time they adopt a mobile phone, the frequency of use, and the frequency with which they adopt a new, more fashionable model. This behaviour may constrain the extent to which new features that facilitate the consumption of a broad array of content are adopted in mass markets,[301] which also applies to the adoption of mobile phone devices with broader capabilities, such as Smartphones. However as shown by the case of Nokia's N-Gage below, trendy devices alone do not guarantee success and the quality of content offered on mobile platform is equally important.

Ring tones, which have become increasingly popular in recent years, are a typical type of content which is influenced by fashion as users are willing to regularly purchase new

---

[298] European Commission, 2004: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

[299] Rethink Research 2007: "Mobile TV: Global Standards Review and Forecast for Infrastructure and Handsets 2007 – 2011" Press release available at http://www.rethinkresearch.biz/free_page_view.asp?crypt=%B3%9C%C2%97%8D%86%86%AF%BC%C2%88%97jup%8B%91

[300] Katz, J.E., Blumler, G. and Gurevitch, M. 1974: "Utilisation of Mass Communication by the Individual", in JG Blumer and Katz, E. (Editors) The Uses of Mass Communications: Current Perspectives on Gratifications Research. Beverly Hills, CA: Sage.

[301] Katz, J.E. and Sugiyama, S. 2006: "Mobile phones as fashion statements: evidence from student surveys in the US and Japan". New Media and Society 8:2.

ringtones[302] to keep up with the latest hits. Ring tones make up a significant share of major labels' digital revenues and it was expected that ring tones would account for the largest share of mobile content purchases by German, Italian and UK consumers in 2006, as reported in a 2006 study by GSM Europe.[303] Ring tones are subject to a carefully composed marketing mix which includes mobile marketing, careful choice of the ring tone (i.e. which part of a song will be selected) and timing of release to wireless operators. Ring tones are a way for fans to identify themselves with something popular and unsurprisingly most ring tones are also radio hits. Ring tones sales happen mostly through the mobile carrier and the placement of a ring tone on a mobile operator hit list is decisive for its success. Ring tones have become fashion accessories as much as the mobile devices themselves, they enable users to differentiate themselves from others and remixes of ring tones are not uncommon, various versions of a ring tone giving users more ample opportunity for personalisation.[304]

Mini Case - Content quality, mobility, convergence and fashion: Nokia's N-gage

Nokia's N-Gage mobile phone/handheld gaming device product line was discontinued in 2006 after three years of lacklustre performance. N-Gage received strong criticisms because of its design which made it awkward to use as a mobile phone and resulted in it being nicknamed 'the Taco': unconventional controls, small screen-size and lack of high quality games. The failure of this system, especially when compared to the success of dedicated handheld gaming platforms such as Sony's PSP and Nintendo DS puts in doubt the extent to which mobile phones might be able to address efficiently the needs of hardcore gamers, as a consequence of the need to incorporate a broad range of heterogeneous, in some cases conflicting features (e.g. large screen size and touchpad) in a mobile platform.

However Nokia revealed recently that it is working on reviving its N-Gage service through cross-platform games and user-generated content. *Project White Rock*, a multiplayer game for both mobile and PC platforms is part of a broader plan to create a community around the N-Gage platform: "For one of the titles we are working on, we are looking at the possibility of letting players create a game and share that experience with others". The new N Gage platform is software driven and not handset-driven, and building a community is a central aspect of the new Nokia strategy. The new games are planned for release in early 2008. (Develop, 19 October 2007: "N-Gage looks towards user-generated content")

---

[302] OECD, 2005: "Digital broadband content: Mobile Content – New Content for New Platforms"
[303] GSM Europe, 2006: "Study on the role of mobile services in growing the legitimate content market" available at http://www.gsmworld.com/gsmeurope/documents/DRM_study.pdf
[304] See http://news.zdnet.com/2100-9588_22-6214616.html

2.1.2. Content distribution

This sub-section focuses on the areas of customer demand related to technologies used to distribute creative content and the associated business models. The key issues and questions are summarised in the Table 2:

Table 2: Content distribution issues

Area	Technology	Demand issues	Insight
Content Distribution	DRM and Fair Use	What is consumer attitude towards DRMs?	Excessive restrictions on the perceived fair use of legally purchased digital content will limit its uptake, although in some cases the extent to which customers are aware of DRM issues with specific formats is unclear.
	File Sharing	What are the consumption patterns of file sharing communities? What determines the attractiveness of a digital distribution channel for customers?	File sharing leads to the diffusion of content which can be beneficial for artists. Price is an important determinant of digital platform competitiveness, but conditions of use, easy modalities of payment (especially for younger users) and breadth of catalogue are also important. File sharing networks present important advantages in all these areas over their legal counterparts.
	Subscription services and 'evolutionary' releases	To which extent do customers want to own/download content, instead of subscribing to it?	It is important for content providers to take into account pricing and fairness issues when engaging in evolutionary releases of content.
	Online advertising	What is the consumer perception of online advertising, and its impact on the quality of their content consumption experiences?	Advertising which is perceived to be invasive or irrelevant might impact negatively the user experience and the attractiveness of a platform
	Convergence	To which extent is there a demand for digital convergence at home?	Hardware price, configuration ease and availability of content will be essential determinants of the adoption of convergence technologies at home.

a) Digital Rights Management and fair use

Although rights owners have presented the use of DRM as a strategy necessary to curtail the illegal distribution of their content, the implementation of these measures has created hostility amongst consumers who consider the restrictions excessive, in some cases infringing on their fair use rights (e.g. the possibility of creating back-up copies, lending content, or reverse-engineering the devices that they have purchased). Those who implement stringent DRMs seem to assume a potentially criminal behaviour in every consumer. This, together with the heavy-handed tactics of right-owner associations in the prosecution of individuals who divulge vulnerabilities in DRMs or engage in filesharing activities, has only contributed to increase the tensions between content producers and many of their customers. The absence of interoperable DRM standards has also been perceived as a barrier to the mass-market adoption of digital content, not only in the music sector but also in the case of e-Books.[305]

---

[305] The International Digital Publishing Forum 2006 user survey shows that around 50% of respondents were only moderately satisfied or less with the possibilities of moving e-Book content between devices. This feature was rated as important by 80% of respondents. IDPF 2006: "E-Book User Survey 2006", February 2006. Available at http://www.idpf.org/doc_library/surveys/IDPF_eBook_User_Survey_2006.pdf

European internet users make widespread use of digital music which encompasses content downloaded to mp3 players, net radio stations (both net exclusive and those also transmitted through analogue channels, which includes the 60% of Europeans who listen to the radio daily, with a preference for music channels)[306] and the use of computers themselves for storing and playing music. Not only do customers buy and create music themselves, the social use of digital music is also important, one of the aspirations being the possibility of sharing with friends and like-minded social groups. This is nothing new - mix tapes have now become mix CDs - and customers want to be able to transfer music both into tangible formats and between devices as well as share digital music files with friends and family. As a result, consumers have chosen to use and pay for music formats (and associated distribution platforms) that enable them to take these actions, i.e. those formats which are not heavily DRM protected. The success of the iTunes/iPod platform, based on the relatively tolerant FairPlay DRM standard, and current discussions about the adoption of blanket licenses and watermarking technologies seem to point towards the abandonment of past DRM schemes, which would have led to the fragmentation of content consumption through highly granular pricing schemes.[307] However, the specifics of music protection and formatting are lost on many European customers – a large proportion of Internet and digital music consumers have not heard of DRM and its restrictions on the use of digital content, and many neither know nor care about copyright issues.[308] A way to tackle this problem and increase awareness about DRM would be to use labelling so that consumers would be informed when buying digital content about what they will and will not be able to do this content.

Mini case - Digital Rights Management: Microsoft Zune

Although it is still too early in the life-cycle of the Microsoft MP3 player to consider it a failure, the sales of this device have failed to make a dent in the iPod market share. It has been argued that the implementation of stringent DRM measures in the device have crippled the possibility of sharing songs wirelessly with other users, one of the main features that differentiates this device from Apple's line, diminishing its attractiveness for users.

---

b) File-sharing

Although publishers have accused file sharing networks of decreasing record sales and box office takings, there are some gaps in the argument. The premise appears to be that customers will continue to spend a certain proportion of their income on the acquisition of content distributed in traditional formats in the face of alternative means of acquiring content (both illegally and legally) that better suit the use of the new generations of hardware devices. While mass re-publishing of content by file sharing services that accommodate tens of thousands of downloads is likely to have an impact on film and recorded music sales, individuals distributing content (by whatever means) within relatively small social networks will also have a major aggregate impact on record and film sales. However, the relative importance of large and small

---

[306] Alam, E. 2004: "How do people around the world use their leisure time?" Focus on Culture: Quarterly Bulletin from the Culture Statistice Program, 14:4.

[307] EMI has announced that it will sell DRM-free music on iTunes for a premium price BBC News, 2007: "EMI takes locks off music tracks", April 2nd 2007.

[308] Berlecon Research, 2005: "Digital Music Usage and DRM: Results from an European Consumer Survey". Berlin: Berlecon Research

scale copyright infringing distribution is, at present, unknown. While the former may be influenced by legal action, it seems unlikely that courts will be willing to hear large numbers of lawsuits involving small-scale infringement. Patterns of acquisition and usage of content are, at this point unclear. In addition, some research has shown that, in addition to illegal downloading, these platforms are used for sampling, searching and discovering new content, starting dynamics which might be beneficial for the artists whose work is shared, potentially increasing its diffusion and visibility. Analyses of the content purchasing habits of file-sharers would contribute to elucidate this question. Additionally, the extent to which the popularisation of these networks appears linked to the unavailability of suitable legal alternatives is also a matter of contention. Determining which are the essential dimensions of a digital distribution platform's competitiveness in terms of price, usability, intelligent interface, quality and diversity of content available, efficiency and conditions of use should help assess the extent to which illegal platforms compete with legal ones, or the degree to which they are used by individuals who in their absence, would purchase content only marginally.[309] In Europe although they are less popular for storing and sharing music than tangible CD formats, peer-to-peer (P2P) networks are being widely used, especially by young people, as shown by an INDICARE survey of "Digital Music usage and DRM":[310] over 70% of all digital music users have copied or ripped their own or their friends/relatives' CDs in the 6 months up to the survey, while 51% used P2P or file sharing networks. Nearly 60% of the teenagers used P2P while less than 50% of the 40+ age group did.

Mini case - File-sharing: Napster

The difficulties of Napster Mark 2, the 'legal' version of the first successful file-sharing service, shows again how DRM issues and the lack of a broad catalogue, linked to publishers' reluctance to make their content available online can make a service unappealing to consumers. It has also been argued that file-sharing services are too strongly associated, in "customers minds", with free music for a per-pay service to work in this market (Weinstein 2006: "Napster: Microsoft to Blame for our Failure Against Apple").

---

c) **"Trust" issues**

Whatever the distribution channel chosen to reach consumers, their attitudes towards E-Commerce entails essential security and privacy issues; mismanagement of these issues might create mistrust in consumers and reduce the uptake of emerging distribution channels.

For example, consumers increasingly demand a trusted relationship with content providers before purchasing products, as the slow initial adoption of iTunes shows. Customers needed both to trust Apple to provide a usable product, and not to fear prosecution from the major record labels. Likewise, trust is important for customers wanting to make use of services on mobile platforms where one of the most sensitive

---

[309] See Rayna, T. and Striukova, L. 2007: "Digital Rights Management: White Knight or Trojan Horse? " University of Bristol EFM Working Paper series, available at
http://www.efm.bris.ac.uk/economics/working_papers/pdffiles/dp07596.pdf

[310] INDICARE 2005: "Digital Music usage and DRM – Results from a European Consumer Survey", available at
http://www.indicare.org/tiki-download_file.php?fileId=110

issues is the security of data transmission[311] as well as for the development of ambient intelligence in European societies. Before the use of these easy-to-use interfaces embedded in many objects and capable of recognising and responding to their environment becomes widespread, trust and social cohesion between the customer, the interfaces and the companies themselves will need to be established.[312]

Mini case – "Trust" issues: Xbox Live fraud

Microsoft has recently received strong criticisms for its failure to address credit card theft in its highly successful Xbox Live online gaming platform: according to consumer reports, credit card details have been stolen and used to purchase Microsoft Points, the service's micro-currency. Although Microsoft acknowledged the issue recently, it appears that its customer management services have, when contacted about the issue in the past, been unhelpful and asked affected parties to contact their credit card companies instead of implementing measures to address the issue.

---

d) Subscription and evolutionary releases

We have argued that one of the essential features of the new digital environment is the facility with which creative content goods can be released and upgraded in highly dynamic environments. In the absence of suitable standards for micro-payments, the implementation of subscription services makes it possible for customers to subscribe to 'streams of incremental releases' on a periodic basis. However, the relative lack of success of Rhapsody (a service in the US), Napster and Microsoft Marketplace subscription services (compared to, for example, the iTunes Music Store download model) might cast doubts on the extent to which this model appeals to customers who prefer to "own" the content they download. The fact that in some cases access to the content acquired through subscription services in the past is lost if the user decides to cancel her membership might have contributed to reduce the attractiveness of this model.

Mini case - Evolutionary releases: Digital distribution of video games

We pointed out in our previous discussion paper that the adoption of evolutionary release models for video games constituted a promising avenue to reduce publication risks by increasing their shelf life and facilitating the introduction of user feedback into the development process, as well as diminishing the extent of piracy.

However, it appears that the implementation of these models has offended user groups who see the sale of "keys" to unlock content in video games they have purchased as a means for publishers to capture an extra return, inasmuch the content they are gaining access to was already contained in the 'finished product' they purchased. This controversy highlights the need to ensure a perception of fairness in the interaction between publishers and users, and raises issues about the nature of evolutionary content. (Edge 2007: "What's in a Video Game", March 2007).

---

[311] European Commission, 2004: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

[312] Foresight on Information Society Technology (Fistera), 2005: "The Fistera Delphi: Future Challenges, Application and Priorities for Socially Beneficial Information Society Technologies". Fistera/Prest: The University of Manchester.

e) Attitudes towards online advertising

Advertising is an essential source of revenue in the online environment and is likely to become more important in areas such as online gaming, as shown by Google's recent acquisition of DoubleClick, a company specialised in this area, or the emergence of MMORPGs fully funded via in-game advertisement such as Anarchy Online. However, the effectiveness of advertisement supported business models, and the success of the companies implementing them depends largely on consumer attitudes: while in certain occasions online advertising might increase the verisimilitude of online gaming environments, in some others it might impact immersion negatively and decrease the quality of the gaming experience making the services that adopt it less attractive for consumers.[313]

Advertising messages can be delivered using digital media in many different ways. Product placement, conditional placement, and infomercial (useful information bundled with advertising messages) are all possible modalities already used in broadcast media. Their adaptation to online and mobile application environments allows further customisation of content to known or surmised customer preferences.

The degree to which different kinds of advertisement work in the online context is an important issue for other sub-sectors such as Digital Radio, Internet Protocol Television and Video on Demand, which are currently struggling to define sustainable business models. This might lead to the implementation of alternative revenue models based on subscription or pay-per-download. Following developments in the adult entertainment industry, the traffic-sharing affiliate program scheme is also becoming growingly adopted. In this model, associated companies – "affiliates" – share online traffic between them, most commonly via click-through banner ads. Revenue can be earned either through each "click-through" or via the percentage of traffic which "converts" i.e. results in a subscription or other sale. Some of the challenges facing the sector include the development of the appropriate technology systems in which these models will be embedded and any associated issues of user-friendly interfaces and the promotion of government co-operation with F/OSS[314]-based systems.

f) Convergence

Digital convergence, this is, the possibility of accessing a wide array of content types through multi-purpose devices, is one of the main technological trends currently affecting the Creative Content Sector. Convergence is often depicted as an "end state" in which the "bit stream" (digital information) can be easily accessed through a multiplicity of platforms or, alternatively, in which a single platform becomes multi-use in its capacities (e.g. the mobile phone with Internet browsing capabilities). It is unclear whether customers wish to have all their entertainment delivered to a single platform, as opposed to having a number of specialised devices which can be used for different purposes (e.g. watching TV, playing video games, surfing the Internet). As already pointed out in the discussion on mobility, the implementation of multiple features in a single device might require specific skills for efficient configuration, degrade the quality of the content consumption experience and impact usability negatively. More realistically, convergence is a process in which different concepts of interoperability and platform independence are tested. Viewed as a process, convergence influences prevalent industrial structures and gives rise to new key

---

[313] Bartlett, E. Presentation given at the Northern Exposure Games Conference, 10th May 2007, York.
[314] Free/Open Source Software

players such as hardware and internet service providers, as well as Telcos for mobile platforms, who become essential gatekeepers to access audiences.

In the current state of the convergence process, what customers seem to want is minimal disruption to their current content consumption habits. Whilst the factors driving convergence into the mainstream include the digitisation of content, pervasive broadband access and low-cost high-performance technology, customer demand for content via these convergent devices will have the greatest impact, according to Accenture.[315] As such, the new channels available for content delivery will be the biggest growth driver for content companies, as opposed to new content itself, or any new markets created by convergence. The devices through which customers are most likely to demand content will include those with online and mobile/wireless capabilities. Online channels are most ready to expand the existing content offerings and music is likely to be consumed mostly through mobile and wireless channels.

Mini case - Convergence at home: Wii vs PS3

The Nintendo's Wii console is a relatively dedicated gaming device with limited convergent capabilities while Sony's high-end Playstation 3 features a Blu-Ray DVD player and is aimed at becoming a hub for the consumption of entertainment at home. However the success of the Wii console over the Playstation 3 seems to indicate that the desirability for convergent capacities in hardware devices for the consumption of content is tempered by their higher price. It is important to highlight that the console cycle is at an early stage, and there is still time for PlayStation to acquire dominance over the market. Additionally, other factors such as for example Sony's PR blunders (see PSP mini-case below) and the absence of an attractive range of video games for the console at its launch might explain its lacklustre commercial performance so far.

---

[315] Accenture 2006: "Content: Here, there and everywhere. Accenture Media Content Survey 2006". London: Accenture.

2.1.3 User interaction

Whilst the demand issues in relation to user interaction discussed in this sub-section focus on online gaming environments, they are often relevant to the wider spectrum of user communities such as online social networks and mobile communities. These broader issues are summarised in Table 3 below.

Table 3: User interaction issues

Area	Technology	Demand issues	Insight
User interaction	Social Interaction	To which extent do users demand social interaction features as part of their digital content consumption experiences?	There are essential elements in creative content consumption which can be enhanced in digital contexts, and providers should consider community issues at the core of their competitive strategies.
	User-created information and resources	To which extent do users engage in the creation of information and resources about creative content goods?	Creating space for contribution of information by users might contribute to create valuable complementary assets for content providers, although the actual nature of the information being distributed might be difficult to control.
	Viral marketing	Are consumers willing to engage in viral marketing promotional strategies?	Viral strategies are becoming a growing element of content providers' promotional campaigns, although their misuse might result in consumer backlash and impact negatively trust in the communities where it is used.
	User-generated content	To which extent do customers want to be able to exercise their creativity in online platforms?	In spite of web 2.0 assertions, in some cases customers prefer usability and integrity of the content consumption experience to free rein to exercise their creativity through tools that are difficult to use.
	Attitudes to the interaction with companies	What are consumers' attitudes regarding commercially sponsored communities?	There are important trust issues that should be addressed as part of community building strategies.
	Gender issues	To which extent do content providers consider the specific aspirations and modes of participation of female consumers when designing platforms for user interaction?	Harassment issues should be addressed through the implementation of suitable community management institutions.

a) Social interaction in online environments

The social role of technologies in the Creative Content sector cannot be underestimated - it is not the technologies themselves that are important but the means they provide to facilitate social interaction. As such, social "life style" influences technology adoption more than other factors. Mobile phones satisfy the need to communicate and be social and are, as the ACTeN report describes it "no longer just a means of connecting us to our friends, these devices represent our friends".[316] Similarly, games tie in with broader social phenomena in lives and society, playing

---

[316] European Commission, 2004: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

being intrinsically self-motivated and closely linked to desires that players wish to fulfil through playing.

Following the predecessors of group-playing multi-user dungeons (MUDs), computer games have shifted into online environments, not only in the form of MMPORGs such as World of Warcraft but other arcade-style games such as Counter Strike (in 2004 54% of PC and Mac users played games online).[317] One of the key factors driving these games is an interconnected social space. The most common reason for gamers in Europe to participate is the possibility to socialise with individuals with common interests as they "game" together,[318] video games being more and more a social activity. Gamers' most widespread leisure activity is chatting and spending time with their friends while playing and the success of games derives from the increasingly social nature of the activity.[319] The average hardcore gamer is attracted not only by the different immersive universe offered by online gaming, but also by the opportunity to meet friends. It should be noted that although gaming is a predominantly "young" activity, younger gamers in the UK prefer online games to do their socialising whilst older people fulfil their gaming needs through more traditional routes such as board games and role-playing games.[320]

The online games which allow gamers to connect with each other are the most popular with European gamers. Family groups are also driving demand, with parents and children playing online games together. The social side of gaming also creates cumulative new opportunities beyond the initial driver to game as a way of creating and maintaining social ties. The more customers play online, the more they play with people that they know and the more it expands into their everyday life.[321] Beyond the actual playing of games therefore, many gamers are socially involved with other "extra gaming" activities, including reading online games forums and news sites, chatting with other players, and going with friends to a net cafe to game together.[322] As such, loyalty to online games may come through expanding the social aspects of playing in and around the game, such as spectatorship, betting or customer relationship management (CRM). As the Online Gaming Habits[323] report puts it, "Social interaction is the magic wand".

The social demands aspect of online games also means that games are now shaking off their previous image of a solitary activity played by loners to start intruding into other areas of social entertainments, such as the cinema and sports - for customers, if the entertainment experience itself is both fun and offers the chance to spend time with friends, it is more likely to be "time well spent". If games can offer those experiences then customers may well choose them over other entertainment offerings. The social aspect of gaming may also shape the uptake of games on mobile platforms - while they are becoming increasingly popular, their development might be constrained by

---

[317] Alix 2005: "Beyond P1: Who Plays Online?" Proceedings of the DiGRA 2005 Conference: Changing Views - Worlds in Play

[318] Nielsen Interactive Entertainment: "Video Gamers in Europe 2005" Prepared for the Interactive Software Federation of Europe, April 2005.

[319] See footnote 318.

[320] British Broadcasting Corporation 2005: "Gamers in the UK: Digital play, digital lifestyles", December 2005. Available at: http://open.bbc.co.uk/newmediaresearch/files/BBC_UK_Games_Research_2005.pdf

[321] Game Research: "Online Gaming Habits: United States, United Kingdom and the Nordic Countries". 2002, Game Research: Copenhagen.

[322] See footnote 317.

[323] See footnote 321

their solitary nature.[324] Such social needs may also shape the use of other convergence technologies such as IPTV where customer demand is about the experience of watching audiovisual entertainment on the more social television set rather than the more isolated computers.[325]

b) User-created information and resources

Virtual communities also offer a space for non-professional lay members of the public to collectively contribute their knowledge outside of formalised institutions. Such spaces include long lived digital data collections which arise from the reductions in storage costs and the ease of sharing data via the internet. These digital data commons allow individuals and communities who are not formally recognised information specialists to actively contribute to data collections where their access to necessary resources and expertise[326] would otherwise be limited. Such efforts can lead to the creation of user-generated collections in community led-efforts, or in some cases sponsored by some institution as is the case with the BBC digital collection.

This trend is also relevant for commercial content providers, as resources contributed by customers can become valuable complementary assets for their products: for example, communities of users organised around a particular product might provide customer assistance and advice to novices, as existing online forums do for a broad range of video games. The role of "lurkers" – members of online communities who view resources but do not contribute to them – also needs to be considered as they constitute an extremely high proportion of the membership of these forums. The type of forum also matters, with recent research indicating that there are far more lurkers in video sharing and collaborative authoring communities. Managers and moderators of online forums must therefore remember that the activity they see is only representative of about 10 to 20% of the total community membership.[327]

c) User communities and viral marketing strategies

The potential use of consumer communities to market a company's product appears tightly linked to the previous issue: highly engaged customers carry out word-of-mouth promotional activities which are cheaper and sometimes more successful than traditional advertising.[328] Many companies have tried to encourage this trend through viral marketing campaigns and the creation of "packs" that consumers can use to, for example, create dedicated web-sites or blogs. Video on Demand sites such as YouTube.com can also be used to distribute embeddable promotional content. Commercial interests might however have a negative impact on these activities and generate mistrust as consumers cannot be sure whether a recommendation they receive in a social networking site is from a genuine peer or part of a corporate-sponsored

---

[324] Nielsen Interactive Entertainment: "Video Gamers in Europe 2005" Prepared for the Interactive Software Federation of Europe, April 2005..

[325] Accenture 2006: "International IPTV Consumer Readiness Survey". Available at https://www.accenture.com/NR/rdonlyres/D2632E25-D570-4488-91A3-6709B9745C7C/0/IPTVsurvey.pdf

[326] National Science Foundation 2005: "Long Lived Digital Data Collections: Enabling Research and Education in the 21st Century". September 2005, available at http://www.nsf.gov/pubs/2005/nsb0540/

[327] White D, 2007: "Results of the 'Online Tool Use Survey' undertaken by the JISC funded SPIRE project". Oxford: Oxford University. Available at http://tallblog.conted.ox.ac.uk/wp-content/uploads/2007/03/survey-summary.pdf

[328] Nielsen Buzzmetrics 2006; "Consumer Generated Media 101: Word-of-Mouth in the Age of the Web-Fortified Consumer". New York: Nielsen Buzzmetrics.

marketing campaign. Research on the issue has shown that 69% of customers do not trust information about products they receive in "social media" sites.[329]

<div style="border:1px solid black; background-color:#cccccc; padding:10px;">

Mini case - User communities and viral marketing strategies: All I want for Christmas is a PSP

The backlash against Sony's thinly concealed attempt to boost the sales of its PSP handheld console through the creation of a fake blog where two supposed fans tried to convince readers to get their parents to purchase them a PSP for Christmas constitutes an example of the disastrous PR consequences that the mismanagement of viral marketing activities might bring companies (The Guardian 2006: "New Sony viral marketing ploy angers consumers" 14 December 2006. Available at http://blogs.guardian.co.uk/games/archives/2006/12/11/new_sony_viral_marketing_ploy_angers_consumers.html)

</div>

d) User-generated content quality and participation in virtual economies

The growth of user-generated content and virtual economies are trends with potentially wide-ranging implications, inasmuch they bring forward a change in the traditional roles of content providers and users, who respectively become platform/service/meta-content providers, and creators of content themselves. This new structure makes it possible to adopt new business models based on, for example, subscription to platforms or the collection of fees on transactions carried out in virtual markets, which, very importantly, enable users themselves to make profits from their creativity. Nevertheless, it is unclear whether consumers will be willing to engage in these active forms of participation for instance in virtual worlds, compared to the most traditional experiences provided by MMORPGs such as World of Warcraft, or reflect on the negative impact that the implementation of virtual economies might have on the perceived fairness of a video game (inasmuch it makes it possible for affluent players to become powerful rapidly without the need to invest time and effort into the game).

Other important issues raised by the implementation of content creation tools in virtual worlds are the management of the Intellectual Property Rights of the created content, and issues of control over uploaded content (inasmuch users might create content in violation of the terms of use of a platform). For example, it has been argued that giving users free rein over the look and feel of a virtual world results in incongruous user experiences and quality problems which might decrease their attractiveness for mass markets. On the other hand, users might consider any restrictions on their capabilities to contribute content as examples of censorship. For example, Microsoft has been strongly criticised for the sluggishness with which its Quality Assurance department processes video games contributed by users to its Xbox Marketplace, a step the company argues is necessary in order to guarantee that the content available in the marketplace fulfils its standards of quality.[330]

---

[329] Center for Media Research 2006: "Brand Awareness Ads a Better Bet Than Trust on Social Media Sites". 6 October 2006. Available
http://publications.mediapost.com/index.cfm?fuseaction=Articles.showArticleHomePage&art_aid=49102
[330] Sheffield, B. 2007: "The YouTube of Games: Microsoft's Game Studio Shane Kim on XNA Studio 2Express (pt. 1) ". Gamasutra, march 21 2007.

Data available regarding customer attitudes in this area are, at this point, limited, although the success of Sony's EverQuest at the implementation of Station Exchange, a virtual marketplace for the exchange of virtual goods (in spite of initial complaints from gamer communities) might constitute an indicator of consumer willingness to participate in virtual communities.[331]

Mini case – User created content in Second Life leads to lawsuit in real life

As reported by the Reuters Second Life News Centre on 3 July 2007, Alderman, a second Life entrepreneur filed a copyright infringement lawsuit against another resident, Catteneo, accusing him of illegally copying and selling its most popular product, a virtual bed. After Alderman first turned to Linden Lab (creator of Second Life) to solve the problem, Alderman was advised to use the in-world abuse reporting system. The lawsuit will set an unusual precedent in virtual world laws, as both the product in question and the defendant do not exist: Second Life residents do not have to reveal their real life identity, and the defendant's true identity and addresses are unknown. Alderman therefore threatened to subpoena Linden Lab for data they may have on their server such as Catteneo's IP address or payment information.
This lawsuit highlights the difficulties that courts and users will face in case of virtual world infringements. It could also undermine the willingness of users to invest efforts in creating virtual world goods if they fear that their IPR cannot be adequately protected.
(Reuters 2007: "SL business sues for copyright infringement" and GigaOmniMedia 2007:"Second Life Avatar Sued for Copyright Infringement")

---

e) Attitudes to the interactions with companies

As consumers create their own virtual communities, they also create their own norms and codes of behaviour within the group. Inherent to this is the idea of "fair play" although all participants do not adhere to these codes. For example, in the area of online games, many users, particularly older ones, are put off playing by too much in-game cheating, bad behaviour (especially immaturity) and not enough team play between players.[332] Some virtual communities such as message boards and online forums have overcome these problems with the use of more codified rules of engagement and the presence of moderators. The question thus stands about whether and how game content companies would manage such moderation and the extent to which they would leave it to their customers. There are fears that the movement of big companies into e-Content markets has spoiled the "well of free and global interaction and communication"[333] that existed online. However, interactive media technology is capable of playing a role in developing communities which companies could exploit to create safe social spaces where their customers can interact.

f) Gender issues in virtual communities

The community nature of online games may go some way towards explaining the gender biases which occur in the gaming communities; whilst 50% of all gamers (i.e.

---

[331] This ties in with the market success of eBay. See CNET News 2005: "Sony scores with Station Exchange". 25 August 2005. Available at http://news.com.com/Sony+scores+with+Station+Exchange/2100-1043_3-5842791.html

[332] Game Research: "Online Gaming Habits: United States, United Kingdom and the Nordic Countries". 2002, Game Research: Copenhagen.

[333] European Commission, 2004: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

including board games, games on mobile phones, online games etc.) are estimated to be female, only 10% of online gamers are women.[334] Game content companies have attempted to increase their attractiveness for women by creating specific classes of games. This in turn stems from the classification of games into taxonomies based on the reasons why customers game, e.g. there are "time killers" who want short games, "devotees" who could spend all of their time gaming and prefer immersive adventure games, and "stress relievers" who play for short periods of time to get away from everyday life.[335] Similar motives have been applied to men and women, leading to the assumption that the lack of female gamers arises from the fact that current games are not geared towards their aspirations. However, the overwhelmingly male composition of the online gaming community may play more of a part, not least in terms of whether women are accepted in these communities. From the inception of MUDs onwards, women have raised concerns about their treatment within them and as the recent furore over Kathy Sierra indicates,[336] the internet can still be an arena for misogynistic attitudes. One potential means for gaming companies to attract female gamers would be to, instead of changing the content of the games (which appears to be less of a problem), provide more of the community moderation described above, either in a top-down form from the company itself, or in a more bottom-up manner through players.

2.2 DEMOGRAPHIC CONSIDERATIONS

2.2.1. Age

At first glance it would seem that, unsurprisingly, it is the youth market which drives demand for both new technologies and ways of creating and managing their content. European teenagers between 15 and 17 purchase new phones every 20 months on average - the fastest amongst all age groups, while older users of 55 and more keep their phone on average for two and a half years, purchasing new phones every 31 months.[337] Not only do they adopt new gadgets more rapidly, the younger customers also know how to use them and are twice as likely to adopt advanced data services such as video downloads and mp3s that can be used on the cutting edge new generations of mobile phones. Youth are also the most committed members of mobile communities with 70% of 13 to 17 year olds engaging with communities and creating content to share across them.[338] Youth activities are not confined to the legal side of content sharing - while 92% of video downloading activities are illegal, they are most popular in the key music buying teenage demographic group.[339] Interestingly, there is also a bias towards youth in legal downloads.[340]

---

[334] Alix 2005: "Beyond P1: Who Plays Online?" Proceedings of the DiGRA 2005 Conference: Changing Views - Worlds in Play

[335] Game Research: "Online Gaming Habits: United States, United Kingdom and the Nordic Countries". 2002, Game Research: Copenhagen.

[336] Kathy Sierra is a well-known software programmer who was subject to misogynistic and abusive comments both on her website and across other sites. More details at Valenti J, 2007: "How the web became a sexists' paradise", The Guardian April 6th 2007.

[337] Telephia: "Q1 2006 European Subscriber and Device Report" May 8th 2006. Telephia: San Francisco

[338] Results of M:Metrics reported in Cellular News 2006: "The MySpace generation expands its Range to Mobile". December 18th 2006, available at: http://www.cellular-news.com/story/21017.php

[339] British Phonographic Industry/British Video Association 2004: "Impact of Illegal File Sharing" March 25th 2004.BPI/British Video Association: London.

[340] Entertainment Media Research 2007: "The Digital Music Survey 2006", available at http://www.entertainmentmediaresearch.com/digitalmusicsurvey_2006.pdf

Use of online social community sites and tools are also more popular amongst young people, with 83% of those between 12 and 21 making use of instant messaging, compared to 32% of older users.[341] Young people also dominate social networking sites - 55% of teenagers have used social networking sites such as MySpace or Facebook, with 48% of teenagers visiting social networking sites daily, according to a Pew survey.[342] These figures may also be understated as the Pew survey also includes 12 and 13 year olds who cannot legally create a profile on MySpace until they are 13.

However, these figures do not tell the whole story. Rather than being simply related to cumulative experience and understanding of technologies, rapid youth adoption is also likely to be shaped by the socio-economic characteristics of the young themselves - namely that they may have more free time, and less money. These factors become apparent when examining adoption patterns in further detail. While teenagers may frequently upgrade their mobile phones, it is in fact the more affluent young professionals in Europe who, although accounting for only 27% of all mobile users, are the largest group of expensive smartphone users (34%), followed by the also affluent 35-44 year-old age group.[343] The interesting point about the recent outrage in Britain after the circulation between schoolchildren of a mobile video showing "how to make the perfect joint" was not the subject matter itself - anything outrageous or anti-authoritarian will always be of interest to the young - but the fact that the video was available as a free download from the mobile service TocMag.[344] With limited access to payment methods such as credit and debit cards, let alone to financial resources, young people make use of free services when and where they can, and when they cannot access them, they create their own entertainment and content. For online services likewise, as internet use and adoption grows and computer and networking costs decrease, the user base is likely to include more young, poor and less-educated people. Despite the rapid take-up of many online services, only 33% of 18 to 34 year olds however make use of online banking, citing security concerns as the major reasons for not doing so.[345]

Similarly, although teenagers may be overrepresented in legal and illegal downloading activities for instance, the latter are not exclusive to this age group but cut across all demographic groups,[346] with 31% of 45 year olds and older regularly downloading music from online sources. It is still somewhat shocking to find out, as it happened in 2005, that European "techies" (those who make use of high-tech devices) are more likely to be those between 30 to 49 rather than their younger counterparts.[347] The news that the number of MySpace teenage users dropped from 24.7% in 2005 to 11.9% in 2006 was also greeted with surprise as it seemed that older entrants were muscling out younger users.[348] However, a closer examination again reveals that the situation is not so simple - although the percentage

[341] Forrester Research: "Teens + Social Computing = Social Shopping", September 25th 2006. Forrester: Cambridge, MA.
[342] Pew Internet: "Social Networking Sites and Teens: An Overview", January 7th 2007. Available at http://www.pewinternet.org/PPF/r/198/report_display.asp
[343] Telephia: "Q3 2006 European Subscriber and Device Report" September 7th 2006. Telephia: San Francisco
[344] BBC News: "Mobile joint video causes stink". December 20th 2006, available at: http://news.bbc.co.uk/1/hi/technology/6196625.stm
[345] Results of Mintel reported in Yahoo! Finance 2007: "Young Financial Services Consumers Still Want The Personal Touch", March 28th 2007 available at: http://biz.yahoo.com/bw/070328/20070328005755.html?.v=1
[346] Entertainment Media Research 2007: "The Digital Music Survey 2006", available at http://www.entertainmentmediaresearch.com/digitalmusicsurvey_2006.pdf
[347] Results of Playlouder MSP reported in Music Ally: "Sno-cap accepts first sign-ups as Playlouder's users support paid-for p2p". June 16th 2005, available at http://66.102.9.104/search?q=cache:5ptXxs6vtkcJ:www.playloudermsp.com/images/musically_050616.pdf+file+sharing +demographic+teenager&hl=en&ct=clnk&cd=35&gl=uk
[348] Results of comScire Media Metrix reported in TechRepublic: "MySpace drawing "older" visitors, study finds". October 5th 2006, available at: http://articles.techrepublic.com.com/2100-1035_11-6123266.html

of teenagers on the site has dropped, the actual number of those using it rose by 23%. This shift in user demographics highlights another characteristic of virtual communities and the demands of their users - namely, not all communities are created alike. While 68% of MySpace users are 25 or older, this increases to 71% for Friendster users. Similarly, 34% of Facebook users are aged between 18 and 24,[349] which is three times as high as this age groups representation overall online; again, this is unsurprising given that Facebook was originally developed for exclusive use by college students.

What are the implications of these trends for the future? Some of the patterns are likely to continue as the platforms on which content can be created and delivered remain and converge. 92% of today's teenagers who make use of social networking tools such as email, Instant Messaging, text-messaging and virtual communities to stay in touch with their friends[350] will most likely continue with online and mobile tools, maintaining expectations of instant communication and widespread access to information. Similarly, younger people perceive music and video content as intangible digital products which can be downloaded at will causing problems for companies which hope to entice them into paying for their services, not least since teenagers are *the* group most likely to continue downloading in greater quantity in the future.[351] This stands in contrast to the older generation which is more accustomed to music and video products being available in tangible formats such as CDs and records. They are willing to pay for products in these formats but entertainment companies may have more of a challenge in encouraging them to switch to digital products.

The way young people behave and the demands they have largely arise from the fact that they are young. The opportunity to be anonymous online and able to create their own personas away from supervision, parental and other form of authority is an illustration of this. Once they grow older though and have a greater disposable income but less free time because of career and family responsibilities, their demands for social media products and services may shift radically.

Another trend which appears linked to age issues is the emergence of new markets for digital content, particularly in the area of video games, where the high price of games for next generation consoles has led players in the sector to acknowledge the importance of older segments of the market (what has been defined as "silver gamers") as sources of revenue. The development of innovative user interfaces such as the wii mote is an example of the concrete steps taken to cater for new market segments. This trend appears associated with demand for new types of content, such as casual and strategy games, moving away from traditionally established genres defined in a previous context in which the industry considered teenagers as its target market.[352]

2.2.2. Gender

As with age-based demographics, the initial assumption that men adopt social media more rapidly and to a greater extent than women also requires closer examination. The penetration of podcasts is most significant amongst men, and there is also a bias towards males in legal

---

[349] See footnote 348
[350] Pew Internet 2007: "Social Networking Sites and Teens: An Overview", January 7th 2007. Available at http://www.pewinternet.org/PPF/r/198/report_display.asp
[351] Entertainment Media Research 2006: "The Digital Music Survey 2006"
[352] CEA 2006: "CEA Study finds adults spend more time gaming than teens". Press release available at http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=10972

downloading activities.[353, 354] The percentage of women using the Internet also lags behind the percentage of men, not least for older women and women also spend less time online.[355] While both are equally likely to use the internet to make online purchases, men are more likely to pay for digital content such as music and video downloads, males being also more likely to be broadband users; they are also more likely to remix these files and listen to online radio. However, these figures again do not tell the full story. Although in Europe the majority of smartphones are owned by men, the proportion of female owning smartphones is increasing and both men and women are equally likely to own mobile phones.[356]

Women are also catching up in most areas of Internet activity, especially the younger ones. They are also more likely to make use of online and digital tools for social purposes, to nurture relationships, and to gather and exchange information via membership in virtual communities. This trend continues with the younger generation, older female teenagers aged 15-17 being more likely to use social networking sites and create online profiles than their male peers.[357] This same demographic group is less inclined than males to use social networking sites for making new friends or flirting, being more likely instead to use them for cementing existing relationships.

For this reason the role of women as users in social media has risen to much greater prominence recently, with a number of female-targeted social networking sites being launched. These include Martha Stewart Living, Sisterwoman.com,[358] TheLadiesLoos,[359] and more niche-based sites such as GirlGeeks[360] and TechnoDyke.[361] Companies are taking note of this, not only by launching their own pages on sites such as MySpace to target female customers but also by engaging with users there. Referrals from their pages in MySpace account for 5% of all traffic to the TopShop clothing store website. The company attributes this not only to the demographic that they are targeting - New Look and Miss Selfridge share a similar profile of young female customers, but are not getting the same traffic - but also to their active participation in the MySpace community and to the use of the network for specific targeted offers.[362]

Social networking sites like the above aim specifically at women and some of their (perceived) interests, such as shopping, relationships and cookery. In addition, they provide a

---

[353] Entertainment Media Research 2006: "The Digital Music Survey 2006", available at http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=10972 http://www.entertainmentmediaresearch.com/digitalmusicsurvey_2006.pdf

[354] Results of Playlouder MSP reported in Music Ally: "Sno-cap accepts first sign-ups as Playlouder's users support paid-for p2p". June 16th 2005, available at http://www.musically.com/cgi-bin/displayPDF.cgi?pdf=050616/MusicAlly_050616.pdf http://66.102.9.104/search?q=cache:5ptXxs6vtkcJ:www.playloudermsp.com/images/musically_050616.pdf+file+sharing+demographic+teenager&hl=en&ct=clnk&cd=35&gl=uk

[355] Pew Internet 2005: "How Men and Women Use the Internet". December 28th 2005, available at http://www.pewinternet.org/PPF/r/171/report_display.asp

[356] Telephia 2006: "Q3 2006 European Subscriber and Device Report" September 7th 2006. Telephia: San Francisco.

[357] Pew Internet 2006: "How Men and Women Use the Internet". December 28th 2005, available at http://www.pewinternet.org/PPF/r/171/report_display.asp

[358] MarketingVox 2006: "Martha Steward to launch women's social network". May 24th 2006, available at http://www.marketingvox.com/archives/2006/05/24/martha_stewart_to_launch_womens_social_network/

[359] "The Ladies Loos" is a European online virtual community aimed at all women, and is located at http://www.theladiesloos.co.uk

[360] "GirlGeeks" is an online resource site and community forum aimed at "women and girls interested in technology and computing", and is located at http://www.girlgeeks.org

[361] "TechnoDyke" is a online virtual community for queer women who "know how to turn on a computer", and is located at htttp://www.technodyke.com

[362] Results of TopShop reported in e-Consultancy: "Topshop traffic from MySpace grows". March 1st 2007, available at http://www.e-consultancy.com/news-blog/362777/topshop-traffic-from-myspace-grows.html

"safe space" where women can talk about such matters openly. However, as mentioned previously, women are clearly absent from generic, non-gender specific communities such as those devoted to online gaming. This may be due to the pressures and prejudices that women encounter in such spaces - participants with female-identified usernames are 25 times more likely to experience harassment than their male-identified counterparts.[363] While female-targeted communities may help overcome these difficulties, they do not entirely solve the core issue of harassment, on the contrary they may contribute to a "ghettoisation" of the web whereby user groups who are more likely to encounter prejudice are confined to certain spaces and unable to make full use of the services and communities on offer. A sensible option would be to exert greater care with the moderation of the communities which already exist to make them as accessible as possible for as many participants as possible.

2.3 SOME PREVALENT ISSUES

The current technology trends and business models evolution together with the demand issues analysed in this paper have the potential to open up very different evolutionary paths for the creative content sector. However, in spite of the apparent unstable environment that characterises the sector, a number of issues appear to remain essential regardless of current uncertainties regarding the specifics of innovative process and market demand factors that bear on them. One could say that, no matter what happens, these issues are key determinants of technology uptake and competitiveness:

- **Usability**

Mass markets do not demand technologies and platforms for the sake of owning them; they are but means for an end, which is to access high quality content in a convenient and easy way. By convenience we refer to the extent to which processes of content selection, access, configuration and payment can be undertaken in a straightforward way by inexperienced consumers who place a high value on their leisure time and might therefore be unwilling, or even averse, to engage in any sort of time-intensive configuration activity. These processes are very importantly linked to a number of technological issues we have discussed such as user interfaces for browsing and reproduction, transmission between different devices and creation of back-up copies (frequently constrained by stringent DRMs).

- **Interoperability**

As evidenced in this paper, "content is king", and without an attractive catalogue, even the most sophisticated and functional platform will fail in the mass market. This availability, importantly linked to standard issues, which determine the possibilities of connecting pools of content to markets through specific delivery pipelines, appears constrained by current fragmentation in a number of areas. Those include formats, DRMs or payment systems, as hardware, content and service providers try to establish dominant proprietary standards in order to lock in customers and extract revenues from other participants in the value chain. Processes of convergence in these areas should create more competitive ecosystems promoting innovation and favouring both consumers and content creators, whose range of choice is enhanced.

---

[363] Meyer, R. and Cukier, M. 2006: "Assessing the Attack Threat due to IRC Channels, University of Maryland. May 2006, available at http://www.enre.umd.edu/content/rmeyer-assessing.pdf

- **Communication**

One essential feature that characterises the Information Society, and particularly cultural goods, is the demand for communication features in devices and infrastructures that enable consumers to engage in social processes of collective cultural consumption with outcomes that can be highly valuable from a commercial and social perspective. Bringing consumer networks to the forefront adds value to the activities of platform and content providers, and is steadily becoming an essential source of competitive advantage inasmuch it makes it possible to gauge changes in uncertain demand, promote brand loyalty and identify talent. However, managing interactions with the consumer base is a highly complicated task which might require content creators to relinquish control over their intellectual property, and abandon opportunistic audience monetization strategies in order to build up long-term relationships based on trust.

- **Attention**

A corollary of the previous three issues is the fact that in the highly competitive context of the creative content industries, content and platform providers need to maximise the extent to which they can engage the attention of consumers. These are constantly subject to sensorial stimuli, both in the physical and digital realms, and in many cases companies resort to innovative promotional techniques which might involve the reconfiguration or broad diffusion of creative content goods, to ensure the monetisation of such attention, with a constant emphasis on sustainability (which can be for example achieved through the creation of healthy user communities).

3. CONCLUSIONS

From a customer demands point of view there seems to be two key issues at play: on the one hand, the radical changes that digital technologies have brought about in the sector and on the other the comparatively stable and unchanging nature of what customers actually want from creative content products and services. Change has shaped the format in which many entertainment products are delivered and consumed, and the importance of the shift from tangible to intangible cannot be underestimated, particularly in terms of how customers now perceive ownership and thus payment. There is another shift as well, towards an increasingly networked community-type customer base, enabled by digital and online technologies, which has changed the nature of company-customer interactions from an individual approach to a collective one. In other words, in order to succeed companies must now take into account the collective, networked nature of their customer base and the social interactions between them.

Yet some things still remain the same. Music remains a highly social product, not one to be listened to in isolation and then discarded but instead one to be collected, stored and shared with friends. The demand for means that enable the build-up and nurturing of social relationships is strong, and it matters little whether these are tools specifically designed for this purpose, such as social networking sites or applications geared towards entertainment purposes, such as multi-player online games. With this demand comes the wish to sustain these social interactions as much "real-time" as possible. Young people in particular continue to look for means to stay in contact with their friends, while shaping their own space and identity. A similar situation occurs with other types of audiovisual content, as the popularity of fan websites dedicated to book authors, TV series or films shows: creative content goods are not consumed in a social vacuum, and those actors better able to provide their consumers with the infrastructure necessary to communicate with each other and provide feedback, could reap important benefits.

The challenge for companies in this context is to marry the rather constant customer demands with the rapidly changing means to address them, as well as the changing expectations that arise with them. The wish to keep in contact with friends remains constant, but as a result of services such as instant messenger and email, customers expect to be able to do so round the clock. Rather than taking a top-down approach and considering technologies first, companies would be wise to examine first what customers want, the ways they want it and then determine how to meet the demand; there is hardly any demand for technology simply for the sake of it.

However, despite the steep learning curve that customers are on and the rapidly decreasing knowledge gap, customers are not adjusting smoothly to the evolving technologies finding them disturbing and disruptive instead. Companies need to recognise this and work to build trust and awareness. This is particularly necessary in scenarios which involve financial transactions and security of data: the means by which intangible products are purchased and the security of financial and personal data during these transactions are still met with distrust, an issue which companies must solve if their revenue models are to remain sustainable. Also related to intangibility is the release of evolutionary content, add-ons, extras and other complementary types of content. The creation of new revenue streams from the sale of such types of content to communities of fans might generate dissatisfaction, as the latter might consider that they are being forced to purchase content which should have been included in

the "main release". Consumer expectations should therefore be assessed and managed carefully before the implementation of such strategies.

As previously discussed, it is tempting to look towards the younger generation to extrapolate a picture of what tomorrow's paying customer base will look like. In some respects this approach is justified. Younger users are growing up in a space where many entertainment products are intangible, easily modified and customised, widely accessible for free, and where they can contact their social acquaintances 24 hours a day through a variety of channels. Naturally, this will affect their expectations about products and services and their delivery. Nevertheless it is also important to unpick these factors from those linked to their youth, i.e. with less responsibilities they are able to make more use of 24/7 communication means than older generations; with fewer financial resources, the need for cheap or free entertainment means are high, some of which they will create themselves.

Finally, and to close the discussion, we would like to emphasise one of the golden rules of the media and creative content industries which sometimes seems to be forgotten in this highly dynamic environment, i.e. the fact that "content is king". We have already shown how the majority of consumers acquire technologies not for the sake of owning sophisticated devices, but as gateways to content. Those actors introducing new platforms, services and devices should ensure, through appropriate licensing policies, or by complying with widely accepted standards, that their offerings make it possible for consumers to access the content they want, and in conditions which are perceived to be fair.

The above social/societal trends and the way they relate to technology developments provide interesting insight for market players devising business plans but they are equally relevant for policy makers who should take those into account when defining policies in support of the creative content sector development.

ACRONYMS / GLOSSARY

Acronym/ Term	Description
DRM	Digital Rights Management
HDTV	High Density Television
ICT	Information and Communication Technologies
IPR	Intellectual Property Rights
IPTV	Internet Protocol Television
MMORPG	Massive Multi-player Online Role Playing Game
F/OSS	Free/Open Source Software
OPAC	Online Public Access Catalogue

REFERENCES

- **Accenture 2006**: "International IPTV Consumer Readiness Survey". Available at https://www.accenture.com/NR/rdonlyres/D2632E25-D570-4488-91A3-6709B9745C7C/0/IPTVsurvey.pdf

- **Accenture 2006**: "Content: Here, there and everywhere. Accenture Media Content Survey 2006". London: Accenture.

- **Alam, E. 2004**: "How do people around the world use their leisure time?" Focus on Culture: Quarterly Bulletin from the Culture Statistice Program, 14:4.

- **Alix 2005**: "Beyond P1: Who Plays Online?" Proceedings of the DiGRA 2005 Conference: Changing Views - Worlds in Play.

- **Bartlett, E. 2007:** Presentation given at the Northern Exposure Games Conference, 10th May 2007, York.

- **BBC 2005:** "Gamers in the UK: Digital play, digital lifestyles", December 2005. Available at http://open.bbc.co.uk/newmediaresearch/files/BBC_UK_Games_Research_2005.pdf

- **BBC News 2006**: "Mobile joint video causes stink". December 20th 2006, available at http://news.bbc.co.uk/1/hi/technology/6196625.stm

- **BBC News 2007**: "EMI takes locks off music tracks", April 2nd 2007.

- **Berlecon Research 2005**: "Digital Music Usage and DRM: Results from an European Consumer Survey". Berlin: Berlecon Research.

- **British Phonographic Industry/British Video Association 2004**: "Impact of Illegal File Sharing" March 25th 2004.BPI/British Video Association: London.

- **CEA 2006:** 'CEA Study finds adults spend more time gaming than teens'. Press release available at http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=10972

- **Center for Media Research 2006**: 'Brand Awareness Ads a Better Bet Than Trust on Social Media Sites'. 6 October 2006. Available at http://publications.mediapost.com/index.cfm?fuseaction=Articles.showArticleHomePage&art_aid=49102

- **CNET News 2005**: 'Sony scores with Station Exchange'. 25 August 2005. Available at http://news.com.com/Sony+scores+with+Station+Exchange/2100-1043_3-5842791.html

- **comScire Media Metrix 2006** reported in TechRepublic: "MySpace drawing "older" visitors, study finds". October 5th 2006, available at http://articles.techrepublic.com.com/2100-1035_11-6123266.html

- **Develop 2007**: "N-Gage looks towards user-generated content". 19 October 2007. Available at http://www.developmag.com/news/28675/N-Gage-looks-towards-user-generated-content

- **e-Consultancy 2007**: "Topshop traffic from MySpace grows". March 1st 2007, available at http://www.e-consultancy.com/news-blog/362777/topshop-traffic-from-myspace-grows.html

- **Entertainment Media Research 2006**: "The Digital Music Survey 2006", available at http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=10972 http://www.entertainmentmediaresearch.com/digitalmusicsurvey_2006.pdf

- **European Commission 2004**: "Anticipating Content Technology Needs: Business Monitor and Know-How Transfer". European Commission/ACTeN. Available at http://www.acten.net

- **Foresight on Information Society Technology (Fistera) 2005**: "The Fistera Delphi: Future Challenges, Application and Priorities for Socially Beneficial Information Society Technologies". Fistera/Prest: The University of Manchester.

- **Forrester Research 2006**: "Teens + Social Computing = Social Shopping", September 25th 2006. Forrester: Cambridge, MA.

- **Game Research 2002**: "Online Gaming Habits: United States, United Kingdom and the Nordic Countries". 2002, Game Research: Copenhagen.

- **GigaOmniMedia 2007**:"Second Life Avatar Sued for Copyright Infringement". 4 July 2007. Available at http://gigaom.com/2007/07/04/second-life-avatar-sued-for-copyright-infringement/

- **GSM Europe, 2006**: "Study on the role of mobile services in growing the legitimate content market" available at http://www.gsmworld.com/gsmeurope/documents/DRM_study.pdf

- **IBM Business Consulting Services 2004**: "Media and Entertainment 2010". March 20th 2004, available at http://www-935.ibm.com/services/us/index.wss/ibvstudy/imc/a1001755?cntxtId=a1000062

- **INDICARE 2005**: "Digital Music usage and DRM - Results from an European Consumer Survey", available at http://www.indicare.org/tiki-download_file.php?fileId=110

- **Juniper Research 2006** reported in The Register 2006: "Casual games' to fuel mobile gaming market" October 6th 2007 available at http://www.theregister.co.uk/2006/10/06/casual_games_fuel_mobile_market/

- **Katz, J.E. and Sugiyama, S. 2006**: "Mobile phones as fashion statements: evidence from student surveys in the US and Japan". New Media and Society 8:2.

- **Katz, J.E., Blumler, G. and Gurevitch, M. 1974**:"Utilisation of Mass Communication by the Individual", Blumler, J.G. and Katz, E. (Editors) The Uses of Mass Communications: Current Perspectives on Gratifications Research. Beverly Hills, CA: Sage.

- **Leyden, J. 2007**: 'DMCA architect lambasts music moguls' Published 26th March 2007 and available at http://www.theregister.co.uk/2007/03/26/dmca_pants/

- **M:Metric** research results reported by Lim, A 2007: "Crave Talk: Is the mobile phone killing tech?" March 26th 2007. Available at http://crave.cnet.co.uk/mobiles/0,39029453,49288748,00.htm

- **M:Metrics** reported in Cellular News 2006: "The MySpace generation expands its Range to Mobile". December 18th 2006, available at http://www.cellular-news.com/story/21017.php

- **MarketingVox 2006**: "Martha Steward to launch women's social network". May 24th 2006, available at http://www.marketingvox.com/archives/2006/05/24/martha_stewart_to_launch_womens_social_network/

- **Meyer, R. and Cukier, M**. **2006**: University of Maryland: "Assessing the Attack Threat due to IRC Channels". May 2006, available at http://www.enre.umd.edu/content/rmeyer-assessing.pdf

- **Mintel** reported in Yahoo! Finance 2007: "Young Financial Services Consumers Still Want The Personal Touch", March 28th 2007 available at http://biz.yahoo.com/bw/070328/20070328005755.html?.v=1

- **Mobile Entertainment 2007**: "Viewers turned off by mobile TV". February 12th 2007, available at http://www.mobile-ent.biz/news/25663/Viewers-turned-off-by-mobile-TV

- **National Science Foundation 2005**: "Long Lived Digital Data Collections: Enabling Research and Education in the 21st Century". September 2005, available at http://www.nsf.gov/pubs/2005/nsb0540/

- **Nielsen Buzzmetrics 2006**: "Consumer Generated Media 101: Word-of-Mouth in the Age of the Web-Fortified Consumer". New York: Nielsen Buzzmetrics.

- **Nielsen Interactive Entertainment**: "Video Gamers in Europe 2005" Prepared for the Interactive Software Federation of Europe, April 2005.

- **OECD 2005**: "Digital broadband content: Mobile Content – New Content for New Platforms". Available at http://www.oecd.org/dataoecd/19/7/34884388.pdf

- **Pew Internet 2005**: "How Men and Women Use the Internet". December 28th 2005, available at http://www.pewinternet.org/PPF/r/171/report_display.asp

- **Pew Internet 2007**: "Tagging", Pew Internet and America Life Project, January 1st 2007. Available at http://www.pewinternet.org/PPF/r/201/report_display.asp

- **Pew Internet 2007**: "Social Networking Sites and Teens: An Overview", January 7th 2007. Available at http://www.pewinternet.org/PPF/r/198/report_display.asp

- **Playlouder MSP 2005** reported in Music Ally: "Sno-cap accepts first sign-ups as Playlouder's users support paid-for p2p". June 16th 2005, available at

http://66.102.9.104/search?q=cache:5ptXxs6vtkcJ:www.playloudermsp.com/images/musically_050616.pdf+file+sharing+demographic+teenager&hl=en&ct=clnk&cd=35&gl=uk

- **Playlouder MSP 2005** reported in Music Ally: "Sno-cap accepts first sign-ups as Playlouder's users support paid-for p2p". June 16th 2005, available at http://www.musically.com/cgi-bin/displayPDF.cgi?pdf=050616/MusicAlly_050616.pdf http://66.102.9.104/search?q=cache:5ptXxs6vtkcJ:www.playloudermsp.com/images/musically_050616.pdf+file+sharing+demographic+teenager&hl=en&ct=clnk&cd=35&gl=uk

- **Rayna, T. and Striukova, L. 2007**: "Digital Rights Management: White Knight or Trojan Horse?" University of Bristol EFM Working Paper series, available at http://www.efm.bris.ac.uk/economics/working_papers/pdffiles/dp07596.pdf

- **Rethink Research 2007:** "Mobile TV: Global Standards Review and Forecast for Infrastructure and Handsets 2007 – 2011" Press release available at http://www.rethinkresearch.biz/free_page_view.asp?crypt=%B3%9C%C2%97%8D%86%86%AF%BC%C2%88%97jup%8B%91

- **Reuters 2007: "**SL business sues for copyright infringement". 3 July 2007. Available at http://secondlife.reuters.com/stories/2007/07/03/sl-business-sues-for-copyright-infringement/

- **Sheffield, B. 2007**: "The YouTube of Games: Microsoft's Game Studio Shane Kim on XNA Studio 2Express (pt. 1)". Gamasutra, March 21 2007.

- **Sifry, D. 2007**: "State of the Blogosphere April 2007". Available at http://www.sifry.com/stateoftheliveweb/

- **Telephia 2006**: "Q1 2006 European Subscriber and Device Report" May 8th 2006. Telephia: San Francisco

- **Telephia 2006:** "Q3 2006 European Subscriber and Device Report" September 7th 2006. Telephia: San Francisco.

- **The Consumerist 2007**: "How I Became a Music Pirate" Published March 20 2007, available at http://consumerist.com/consumer/drm/how-i-became-a-music-pirate-245644.php

- **The International Digital Publishing Forum (IDPF) 2006**: "E-Book User Survey 2006", February 2006. Available at http://www.idpf.org/doc_library/surveys/IDPF_eBook_User_Survey_2006.pdf

- **Valenti, J. 2007**: "How the web became a sexists' paradise", The Guardian April 6th 2007.

- **White, D. 2007**: "Results of the 'Online Tool Use Survey' undertaken by the JISC funded SPIRE project". Oxford: Oxford University. Available at http://tallblog.conted.ox.ac.uk/wp-content/uploads/2007/03/survey-summary.pdf

- **ZDNet 2007**: "T-Pain takes crown as king of ring tones". 22 October 2007. Available at http://news.zdnet.com/2100-9588_22-6214616.html

Abstract

This report is one of the outcomes of the EPIS06 Project – European Perspectives on the Information Society – carried out by the ETEPS (European Techno-Economic Policy Support) network in cooperation with the Joint Research Centre's Institute for Prospective Technological Studies (JRC IPTS) with the aim of providing strategic intelligence to policy makers by taking a prospective view on the evolution of ICT.

The report forms one of the main building blocks of the EPIS06 project, the analysis of the potential evolution of the creative content sector. It combines three discussion papers with a view to gaining an in-depth understanding of the creative content sector, the ultimate goal being to provide strategic intelligence and recommendations in support of policy making.

Discussion Paper 1 describes the state of the art of the creative content sector in Europe and establishes a present scenario, in market, industrial, technology and business terms, for a set of sub-sectors (books, music, audiovisual production, video games and cultural spaces) engaged in the mass production of creative goods. Discussion Paper 2 analyses the impact of ICT innovations on the industrial structure and dominant business models of these sub-sectors, while Discussion Paper 3 focuses on factors related to consumer demand, and social and institutional issues that might drive or hinder the adoption of these innovations.

The three discussion papers were presented at a workshop (May 2007) and validated by stakeholders from different parts of the creative content sector. The papers were also used as a basis to define theses for a Delphi survey that was carried out in June-July 2007. Finally, the discussion paper findings helped define scenarios for the future of the creative content. These scenarios may be the subject of a separate publication.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.