E-Content
Technologies and Perspectives
for the European Market

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(Editors)

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With 24 Figures and 28 Tables

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Editorial

Every technology is only worth as much as the benefits that it has to offer. This is especially true with regards to the new digital technologies that surround us everywhere we go, in the shape of the Internet, PDAs, mobile phones or all the other digital devices that have become an integral part of our everyday life.

Technology is not used for technology's sake. It is always some content that we are looking for when using all those digital devices. Technology offers us the means of making our lives easier, but only through giving us more efficient access to content. We are looking for a specific information when using search engines, we want to acquire a certain skill when taking part in E-Learning, we want to be entertained when playing games on our mobile phones.

Content is king in the digital world. But content is also an economic factor, and it is especially important for the European Union with its ambitious goal to become the most competitive and dynamic, knowledge-based economy in the world by 2010, a goal often called the Lisbon process. With the enlargement of the European Union in spring 2004, new opportunities in the field of research and technological development as well as business cooperations are opened up. Cross-border cooperation becomes an important factor. One prominent field that is likely to profit from this development is the information and communication technology sector, as well as the multimedia branch and with it the whole E-Content industry.

This in mind, eleven partners from ten European countries – five of them from the new member states – collaborated from 2002 until autumn 2004 in a joint EU-funded project with the aim of "Anticipating Content Technology Needs". This initiative, abbreviated as ACTeN, dedicated itself to supporting the business community and strengthening the multimedia sector in Europe by stimulating innovation in tools, technical environments and product features. This book draws on the work of the project and presents edited and rewritten versions of some of the deliverables. The publication is undertaken as part of the exploitation of results and funded by partner resources.

Architecture of the Initiative

Charting the field of E-Content is a difficult task as technical, economical, and creative trends in this field are linked in highly complex ways. In order

to approach the field from various sides and offer multiple perspectives the ACTeN project used three different methods: 1) Business Roundtables in major European countries that gave practitioners the chance to bring together the different views of supply and demand of E-Content services and to understand how their counterpart is thinking; 2) Scouting Workshops where E-Content trendsetters presented their work to a business and scientific audience and gave insights at the edge of innovation, thus starting a transfer of excellence; 3) Scholars' Network Conferences where leading researchers presented their projects on the subject of E-Content and discussed problems and solutions of today's research in the field. With the presentation of extraordinary solutions and the various meetings of all parties involved, ACTeN helped to understand market developments better and has built a bridge between science and business.

In the course of the project, the general need for summarising the findings according to several fields arose, and thus the idea of "E-Content Reports" was born. Those reports were meant to provide readers with an overall view of the main issues of a specific field, a description of the major players in the market, a description of its trends and of the market's future developments. Because descriptions of the historical development of the field are available, the main attention was directed towards the present situation and future possibilities. The topics selected are covering the whole spectrum of E-Content, analysing some of the most innovative and seminal areas. Some of the chapters of this book are based on these E-Content-Reports while also additional chapters and resources were added.

Resulting Structure of This Book

The book is divided into *three main sections:* The section "E-Content Market in Europe: An Overview" charts the economic side of the E-Content sector in Europe, thus giving an idea of the market conditions in which all E-Content activity takes place. In the section on "Content Applications: Selected Cases" the articles deal with the predominant fields of E-Content. The last main section, "User-Centric Content Production and Interaction", focuses on the end user and his or her modes of using E-Content. The book also features an outlook together with a guide to important resources on E-Content in Europe.

The introductory chapter by Andrea Buchholz and Ansgar Zerfass, "*E-Content in Europe*: *Dimensions of an Emerging Field*", gives a well-founded definition of the term E-Content, something that has been missing both in theory and practice until now. After a stocktaking of the market,

the chapter then introduces major trends and challenges facing this emerging field as well as some findings and recommendations that result from the ACTeN project.

"*Digital Media Service Business*" by Tommi Pelkonen presents an analysis of the current position of digital media companies within the overall value creation process. The article also discusses the market development and presents the key trends that this industry is being confronted with nowadays.

In the next contribution, Jak Boumans deals with the hotly debated issue of "*Paid Content: From Free to Fee*". Especially since the dotcom crisis, it has become clear that online advertising is not sufficient to fund expensive online activities. Thus, a change is currently occurring towards paying for consumer content and trade information. The article combines a look at the Internet and at mobile services.

Attila Nagy then presents the field of "*E-Learning*" as one especially prominent case for E-Content applications. Due to our emerging knowledge economy and the information society, there is a higher demand on the individual for continuous personal learning development. E-Learning promises to offer the means to achieve this in a modern and efficient way. The article thus presents what E-Learning can and cannot do, and what might be future trends in the field.

A different, yet equally promising field of E-Content applications lies in "*Scientific Publishing: A European Strength*", as presented in the chapter written by Zeger Karssen. The possibilities of the Internet and E-Content have challenged the traditional structures of scientific publishing in the fields of Science, Technology, and Medicine (STM) and new business models emerge. This development comes along with a concentration in the STM publishing industry, where in the long run only the biggest players will be able to run profitable online journals.

"*Mobile Games: An Emerging Content Business Area*" are the topic of another chapter by Tommi Pelkonen. The author makes an inquiry into the entertainment possibilities of mobile phones. While games are a common application on computers and consoles already for decades, they also have conquered the mobile phone by now. The chapter illustrates selected key trends in the mobile game business market, including the value creation process.

The final chapter of this section by Jak Boumans deals with "*Cross-Media on the Advance*". Cross-media is a catch phrase in the contemporary media landscape, where content creation for convergent media opens up new markets across media. The chapter reflects upon impacts on the content production chain, the application fields, business models, and the future of cross-media.

A discussion of "*Interactive Digital TV in Europe*" by Janne Orava and Mika Pertulla opens the section on user-centric content production and interaction. Through digitalisation, television is now facing the biggest change process in its history, and all players in the European TV industry are affected by this. The article sheds light on this transition and highlights implications for the broadcast markets.

The article by Ansgar Zerfass and Bernd Hartmann on *"The Usability Factor: Improving the Quality of E-Content"* deals with an increasingly important aspect of digital media: The need to make applications, namely websites, mobile services and online games, as easy-to-use as possible. Business models will pay off if the user is able to access valuable E-Content in an efficient and satisfying way. The chapter discusses the concept of usability, its social and economic implications, methods of usability engineering, and major fields of application.

The section concludes with an overview over "*Experience Machines: Capturing and Retrieving Personal Content*" by Peter Werkhoven. As the permanent use of all kinds of digital devices from PDAs to mobile phones by major parts of the population generates unprecedented amounts of personal content, ways are needed to organise this flood of content in a meaningful manner. The chapter presents selected model applications that offer solutions to the problem, and also discusses social implications of a future where content is never lost.

In an outlook, Peter A. Bruck highlights the "*Prospects of E-Content in Europe*". He mentions past and present developments in the industry and sketches trends that pave the way into the future of European E-Content, also including insight gained from the ACTeN project.

The book concludes with "*A Guide to Resources on E-Content in Europe*" compiled by Andrea Buchholz, Bernd Hartmann and Swaran Sandhu. Information on E-Content is provided by different sources, e.g. online journals and portals, research projects dedicated to special aspects of the overall topic and branch associations. This chapter also portrays the partners who were involved in the ACTeN project and who have become centers of excellence on E-Content in their respective countries.

Credits and Acknowledgements

also indebted to Katharina Wetzel-Vandai from Springer, Heidelberg, for her support of this publication.

A research and dissemination project like ACTeN, combining eleven partners from ten European countries, spanning two years and reaching out to thousands if not ten thousands of people could only become a reality thanks to the overwhelming support of all the partners involved. These were: Digital Dispatch (France), ELET (Slovakia), EADIM European Academy of Digital Media (The Netherlands), Electronic Media Reporting (The Netherlands), ICNM International Center for New Media (Austria), OPI Information Processing Centre (Poland), SC ITC SA Institute for Computers (Romania), MATISZ Hungarian Association of the Content Industry (Hungary), MFG Baden-Württemberg Agency for IT and Media (Germany), MindTrek Association (Finland) and TC AV Technology Centre (Czech Republic). The European Commission funded the project within the IST Information Society Technologies action line; special thanks go to Werner Janusch for accompanying the initiative from Luxembourg.

Dr. Andrea Buchholz was a perfect project leader. Her work contributed to the excellent reviews given to ACTeN by the European Commission. Prof. Dr. Peter A. Bruck, the "spiritus rector" of the initiative, made sure that the project was intertwined with the EUROPRIX and World Summit Award networks. Those initiatives help to make multimedia innovations visible across nations and cultures, thus fostering achievements in content production and distribution.

Finally, thanks go to all the participants in the Business Roundtables, Scouting Workshops, and Scholars' Conferences. The success of the initiative and a lot of the insights reported in this book are due to your creative input and the points of view and experiences you shared in many discussions.

Stuttgart, Salzburg and Paris, February 2005

The editors

Table of Contents

User-Centric Content Production and Interaction

Outlook

Introduction

E-Content in Europe:
Dimensions of an Emerging Field

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E-Content has come a long way: while it started mainly as text-oriented information on the Internet it changed rather speedily to multimedia content, rendering text, graphics, audio and video and combinations of these media types. By now, E-Content is also no longer a phenomenon of the computer only but has switched over to all kinds of networked digital devices, such as mobile phones or personal digital assistants (PDAs). This content explosion demands for an inquiry into the changes brought about in the different dimensions of content production and reception, such as the need for new business models, creation processes and modes of presentation. It also calls for a clarification of what we are talking about when speaking of E-Content. The term has become a buzzword of the new millennium, used in manifold ways. In this article, we will elaborate the concept of E-Content and establish a well-founded definition – something missing in theory and practice until now. We will then look at the dimensions of the market and sketch major challenges for the European E-Content industry. Finally, our article also presents some findings and recommendations resulting from the EU-funded research and dissemination project ACTeN (Anticipating Content Technology Needs), that ran from 2002 to 2004, and in the framework of which most of this book's contributions were produced.

1 Beyond the Technology Hype

When dealing with new media, it is normally just a matter of time until somebody quotes Marshall McLuhan's decades old saying that "The medium is the message" (McLuhan and Fiore 1967) – just as if this is the answer to all questions. What new media have to tell us is basically that they make things possible that were not possible with the older media. However true that may be, this insight doesn't offer any help once those new media aren't that new anymore but have rather created an industry of their own. The excitement over the newness of those media has calmed down and

they have become a regular component of society and economy. Thus, new media are no longer a fancy toy but they do have to serve a purpose. Customers and businesses in Europe nowadays start to reflect the limitations of technocratic visions in the same way philosopher Henry David Thoreau commented the American dream 150 years ago: "We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate" (Thoreau 1854, p 52).

In a situation like this, it is the content that comes to the fore again. If the initial phase of any new medium is much about technology and its promises, an old fashioned but solid factor like content is what really counts once we have understood the message of the medium.

Since the rise of the Internet in the mid-1990s, a lot of technology was developed while little focus was put on the content. Little thought was devoted to the question which kind of content would actually make sense to access online, and also how to use content to gain revenues. Instead, newspapers started to digitise the whole content of their print versions and published them online without any further modification. The surge was so strong that those who refused to jump on the train were immediately branded as not having understood the new information age. However, the crash of the new economy in 2000 put an end to this mindless trend and led to a reflection over how to actually use the new media in a meaningful way. Just like with older media the answer lies in the adequate use of content, not just in the technology.

Important lessons can be learned from the introduction of the video recorder: even a technically inferior device became the standard platform in Europe due to the superior content available. The more advanced German Video 2000 system lost the battle over the standard to the VCR system, due to the lack of enough movies adapted to this system (Heß 1993). Technology alone is quite obviously not sufficient: it is content that sells. When dealing with the new media, it has become customary to speak of E-Content when meaning content that appears online. However, the usage of this term is everything but clear. Therefore, a discussion of the concept and definition of E-Content appears necessary.

2 Defining E-Content

The term E-Content stands in a line of a large number of other terms that are being used in connection with new media without having a clear understanding what is actually meant by them. It has become common to add an

„E-" to all kinds of fields: Government becomes E-Government, Democracy becomes E-Democracy, Business becomes E-Business, and so on.

Often it remains unclear, however, what exactly constitutes the difference between an activity and an E-activity and if there is one at all. Does adding the fashionable prefix "E-" just mean that there are computers and the Internet involved in some way? But how does that make a difference? It should be clarified what exactly E-Content is supposed to mean and how it is different – if at all – from other kind of content.

2.1 From a Broad to a Narrow Understanding

A review of the relevant literature shows that a clear-cut and agreed-upon definition of the term is still missing. As a recent study notes "none of the international or national standard industrial classifications separately identify digital content products or industries" (Pattinson Consulting 2003). Although digital content has been the subject of debate at the OECD (1997, 1998, 1999), work on defining the content sector, digital content or E-Content has not proceeded for a couple of years now.

Thus, the term E-Content is used in a great variety of ways, often without clear indication of what exactly is meant by it. For example, in a collection of interviews that sprang from the United Nation's World Summit Award 2004,[1] experts from a large number of countries worldwide were asked what E-Content means in their country (Manzar and Bruck 2004). Some speak of E-Content without defining it; others give definitions that differ a lot from each other. Therefore, people think about different concepts when speaking about E-Content. Some of the definitions are very broad (e.g. "E-Content is all forms of digital information that's used for multiple purposes in different fields and areas" (Ibid., p 41)); others would also encompass broadcast media (e.g. "E-Content stands for products or services that are electronically delivered" (Ibid., p 271)). Most definitions thus base E-Content solely on the technological means of delivery (e.g. "…content that is in electronic or digital form" (Ibid., p 159); "…any information stored, processed or accessed by electronic means" (Ibid., p 306)). This view of E-Content is similar to a definition given by the OECD that understands the concept as encompassing all "data or information that can be displayed, processed, stored, and transmitted electronically" (OECD 1999).

However, approaches that define E-Content very broad carry some problems. First and foremost, one should make a distinction between data

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[1] See http://www.wsis-award.org

and information: *Data* can be thought of as content only from a strictly technological point of view. Such a definition of E-Content would comprise any kind of data that appears on a screen, even the data produced when groceries are scanned when paying in a grocery store (Handshake Media 2003, p 33). However, these bits and bytes carry no meaning neither for the actors themselves nor for any observer of the situation. Therefore, it makes sense to think of content as being meaningful data or *information,* symbols that can be utilised and interpreted by human actors during communication processes that allow them to share visions and influence each other's knowledge, attitudes or behaviour.

But this doesn't answer yet what E-Content is in comparison to any other kind of content. Does the "E-" just imply a different means of delivery, or does the "E-" actually change what is delivered?

2.2 From Content to E-Content

Content has to be delivered by some kind of medium. Therefore, an inquiry into the history of media seems useful to track the specific attributes of E-Content.

Apart from the first medium ever in history – the human body – the media were always based on some kind of technology. Those technologies got more and more elaborated during the course of media history. This development is mirrored in the classical categorisation of media forms introduced by the German scholar Harry Pross (Pross 1972). He differentiates media according to the technology involved in their production and reception. Pross draws a distinction between primary, secondary, and tertiary media. *Primary media* signify those that are bound to the human body and do not need any kind of technological device, neither in their production nor in their reception. The natural language is the best example for this kind of media. *Secondary media* do need technology on the production side, but not on the reception side, e.g. all kinds of print products like books or newspapers. Finally, *tertiary media* require technological devices both for production and reception. All kinds of broadcast media like radio and TV fall under this category, but also film and CDs as well as the telephone and the networked computer. All kinds of new media are therefore tertiary media. But more generally this category encompasses all media that need electricity in their production and reception, whether the content is stored analogue or digital.

If one would understand E-Content quite literally as *electronic content*, it would thus be identical with the category of tertiary media, and digital content would only be a subcategory of that. Some of the definitions men-

tioned before could mislead to this interpretation. However, this is not how the "E-" is meant usually, and it is also not how E-Content is understood here. In fact, one must rather subdivide this category of tertiary media into media containing *analogue content* (video, broadcast TV and Radio) and *digital content* (DVD, Internet, Digital Radio). Digital content then consists of online as well as offline content. While *offline content* can be stored on a CD-ROM or a DVD, *online content* is always delivered via a network and allows for interactivity and feedback routines.

Only online content – this is our proposal – should be understood as E-Content in a strict sense. E-Content thus is a subcategory of digital content. It is necessary to point to this differentiation as the terms E-Content and digital content are often used as though they were the same. This is for example the case in the eContent programme of the European Commission where digital content is understood as "any information (interactive information, transaction, education, entertainment ...) published on any Internet platform, from the traditional web through wireless devices to Internet appliances and broadband video" (European Commission 2001, p 1). What is described here is actually E-Content, as offline content is explicitly excluded. On the other hand, the ever more important category of mobile content is ignored, which constitutes another limitation of this definition.

2.3 Towards a Qualitative Difference of E-Content

So far, our argument shows that E-Content is defined by different means of delivery. However, E-Content must also make a difference in qualitative aspects in order to distinguish itself from offline content or any other content, and thus to become a distinct content type. Only a qualitative difference gives us reasons for thinking of E-Content as a new concept and as the foundation of new business models and market segments. Indeed, it has been the big mistake of many dotcom companies that they were not able to create content that really made a difference.

E-Content defined as digital information that is integrated into a network has the potential of reaching another level of quality than any other kind of content. It may be changed within a couple of seconds, delivered to millions of people throughout the world, fitted to serve the need of specific communicators and recipients, stored and displayed on an ever-expanding number of devices like computer monitors, mobile phones, PDAs, interactive TV sets and many more.

Therefore, we propose the following *definition* of E-Content:

E-Content is digital information delivered over network-based electronic devices, i.e. symbols that can be utilised and interpreted by human actors during communication processes, which allow them to share visions and influence each other's knowledge, attitudes or behaviour. E-Content allows for user involvement and may change dynamically according to the user's behaviour.

It is a subcategory both of digital and electronic content, marked by the involvement of a network, which leads to a constant renewal of content (contrary to the fixed set of content stored on a carrier such as a CD-ROM, or the content broadcast via TV and Radio). This constant renewal of content in tie with its dynamic change allows for a qualitative difference, thus making it E-Content.

This concept is also supported by media history (Stöber 2004). While all the media that evolutionary developed do not replace each other and can exist at the same time, it is also true that each new medium builds on the former ones but expands the possibilities of what one can do with media. New media thus allow for new kinds of content that were not possible before. The invention of writing allowed for a new kind of organisation of knowledge distinct from the oral tradition; the invention of photography allowed for snapshots of reality; the invention of broadcasting allowed for radio plays.

So while each new medium opens up a whole new world of content opportunities it also brings with it a number of *new requirements and demands* that need to be dealt with in order to fulfil the promises. These demands can be divided into several levels, i.e. the *creation, technological and business* side of the new medium.

For example, with the invention of newspapers, the creation side had to deal with the question what qualifies as "news" and what is suitable journalistic writing, the technological side had to find ways of creating an adequate layout for the content with a satisfying print quality, whereas the business side had to come up with a suitable business model in terms of what content is worth and how to finance it, which in turn would eventually also lead to the rise of press agencies, freelance journalists, and public relations departments. A grander perspective would also include the changes brought about on the content reception side as well as the political and societal impact of content. Any new medium demands for a specific media literacy of the recipient: you have to be able to read to benefit from a newspaper. On the political and societal side, emerging media and their content were elementary more than once in the development of modern democracies.

All these dimensions are also relevant when thinking of E-Content and how it makes a difference. After a stocktaking of the European E-Content market, we will then chart the dimensions of the concept by looking at the technological, business and creation side of the game.

3 Stocktaking of the European E-Content market

In Europe content plays a key role both on the economic and the social side (Bruck 2002, 2005). The sheer size of the content economy at the beginning of this century has been estimated at more than € 400 billion, with over 4 million people employed in this sector (European Commission 2001, p 1). This number, originally proposed by the European Information Technology Observatory, was also confirmed by OECD reports. Content here refers to all kinds of media publishing, marketing, and advertising. According to this estimation, digital content made up for € 50 billion of the size of the whole content industry in the year 2000, with numbers increasing.

3.1 The Symbiosis of ICT and E-Content

However, one has to keep in mind the rather turbulent years that the digital media industry has gone through since then. The slowdown of the information and communication technology (ICT) market also affected the E-Content sector. The steady growth stopped and the market size remained at a certain level for some time as there has been a tendency by major media companies to freeze all kinds of E-Content production after the dotcom crash, focussing again on their core competencies. But while it is true that the expectations that were uttered at the peak of the Internet hype were exaggerated, it is also true that the rather negative vision of the ICT market – and the E-Content industry in tie – that followed afterwards does not have any grounding in reality either. Every single aspect of the value chain in businesses or non-profit organisations may be enhanced by implementing Internet technologies (Zerfass and Haasis 2002) and software is a major driver for innovation even in very traditional branches. For this reason the ICT market remains a thriving force in economic growth, worldwide. A recent study by IDC supports this claim (IDC 2004). Even more significant, the market growth rate that has been slowed down since the crash in 2000/2001 is accelerating again. Although far from the growth rates of the late 1990s, the ICT market has left behind its negative trend after the crash,

and the growth rate is now back to an estimated 4% by 2005 (EITO 2004, p 3)

It is safe to assume a correlation between E-Content and ICT market growth. Access to content stays the main reason to engage oneself within the digital world (Forrester Research 2004, p 149). E-Content is also identified as one of the main drivers for future growth of the ICT market (Lamborghini 2004, p 16). However, clear numbers indicating the current size of the E-Content market in Europe are missing. This is not very surprising keeping in mind the mishmash of terminology in this field mentioned before, and it is even not clear in which sense digital content was understood with regards to the market size in 2000. That's why one can only estimate the actual size of the E-Content market in 2005, based on the growth rates of the ICT market since 2000. Taking the E-Content market size of € 50 billion as a starting point, this leads to the following result:

Table 1. Development of the European E-Content market (Source: own calculation; ICT market growth rates from EITO 2004, p 3)

Year	ICT market growth	Estimated E-Content market size
2000		€ 50 billion
2001	3.2%	*€ 51.60 billion*
2002	0.1%	*€ 51.65 billion*
2003	1.2%	*€ 51.70 billion*
2004	3.0%	*€ 53.25 billion*
2005	4.0%	*€ 55.38 billion*

According to this calculation, the *European E-Content market nowadays is worth about € 55.4 billion.* While this is obviously not an empirical number as there are more factors that play a role in the development of the E-Content market than just the ICT growth, it is at least an indication. Probably that number is even higher as especially the mobile content sector has grown considerably since 2000, and also the Central and Eastern European countries have caught up in E-Content.

If one looks at the usage and production side of E-Content, people and businesses in Europe are well under way in terms of *Internet usage.* According to recent numbers compiled by Morgan Stanley, 29% of all "onliners" live in Europe, compared to 25% users from North America (TNS Infratest 2004, p 164).

Compared to other regions of the world, however, a lot still needs to be done about the *production of E-Content.* While Europe is rather strong in the field of traditional content (for example print publishing), it has to gain

ground when it comes to the creation and exploitation of digital informa-
tion and services. The majority of content on the Internet still originates
from the US. But one must also note that there has been a rise in the web-
sites created in Europe by companies and institutions, thus increasing the
amount of genuinely European E-Content (European Commission 2003).
For a European E-Content market it is therefore important to catch up on
the production side of E-Content.

3.2 A New E-Content Market Situation

The E-Content market in Europe is undergoing a structural change at the
moment. One of the most remarkable trends in the past two years was the
fast *breakthrough of broadband.* This isn't only of technological impor-
tance, but also has implications for E-Content, both on a quantitative and a
qualitative level. A large data throughput is now possible, downloading
music and videos has become easier and spread rapidly. Playing streaming
music and video has become common. E-mail messages have got bigger
attachments containing photographs, graphics and movies. If E-Content
started as a mainly text-oriented category with added pictures, now the
audiovisual media types come into focus.

A crucial change for the E-Content industry also lies in the development
towards *paying for content.* Beyond doubt there is much money to be made
with E-Content. According to the German W3B survey (Fittkau & Maaß
2003) every third German already pays for E-Content. So the "free of
charge"-culture with which the Internet started off is on its fallback. In
Europe paid content is still a nascent industry but is forecasted to grow
rapidly over the next four years and will be worth € 3.2 billion by 2007
(Jupiter Research 2003). 23% of the Europeans are predicted to make
online purchases in 2007 with an average yearly spending of € 70 per
buyer. According to Jupiter Research, the breakdown of consumer spend-
ing on paid online content and services remains diverse. Whereas so far the
largest category of paid online content and services remains adult-related
content, Jupiter Research predicts that by 2007 this pattern will change,
with multimedia related content – driven by high broadband usage – taking
the lead. The experts forecast that multimedia content will represent 50%
of total paid online content and services spending, ahead of paid text and
picture-based services, which will count for just 25% of consumer spend-

ing. For the first time, adult content will not be the primary generator of revenues accounting for just 25% of consumer spending.[2]

A recent report by the market research company IRN Research (2004) that focuses on the information industry gives further reasons why the European online information market will show growth: sales in the *online scientific, technical and medical (STM) information segment* increased by 24% at current prices in 2003. Although this high double-digit increase in sales is explained mainly by significant switching of spending from hard copy sources to new online services, the total European STM market increased by 6% in rather difficult times.[3] With these new opportunities new players and new roles enter the market, as pictured in Figure 1.
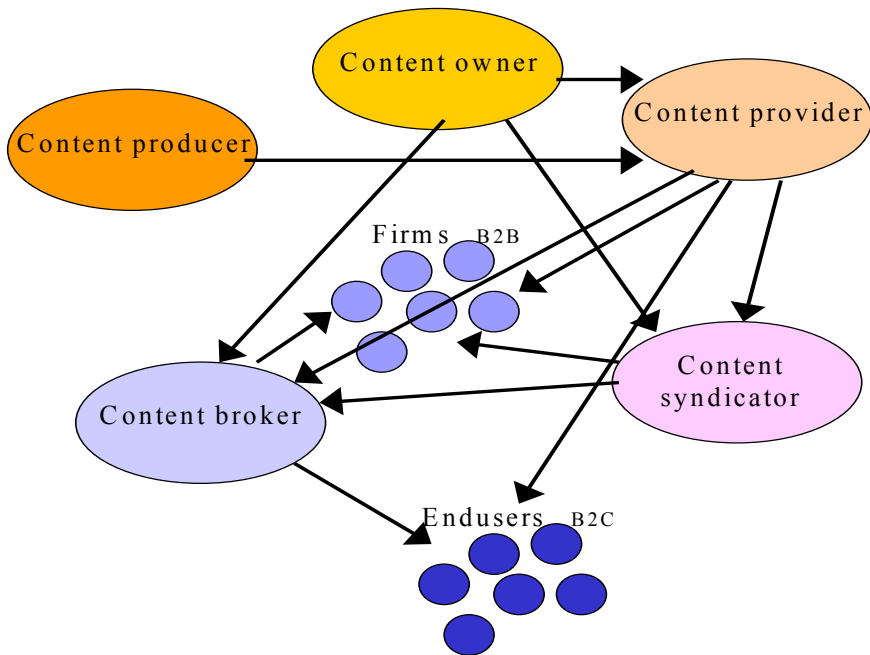

Fig. 1. The competitive environment and roles in the content market
(Source: Schenk 2001)

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[2]   For further considerations see the chapter "Paid Content: From Free to Fee" by Jak Boumans in this book.
[3]   For further considerations see the chapter "Scientific Publishing: A European Strength" by Zeger Karssen in this book.

3.3 The Rise of Mobile E-Content

The situation not only looks promising for E-Content on the Internet, but also for *information distributed via mobile phones*. Given the recent developments of the telecom industry, innovative content on mobile devices might matter as much as – if not more than – E-Content on the Internet. Europe is going mobile and has a leading position in the realm of wireless services. At the beginning of this century, the number of mobile users in Western Europe already doubled the North American market (European Commission 2001, p 1). Nowadays, 73% of all adults use a mobile phone regularly, and this figure is estimated to rise up to 78% until 2007 (Forrester Research 2004, p 197).
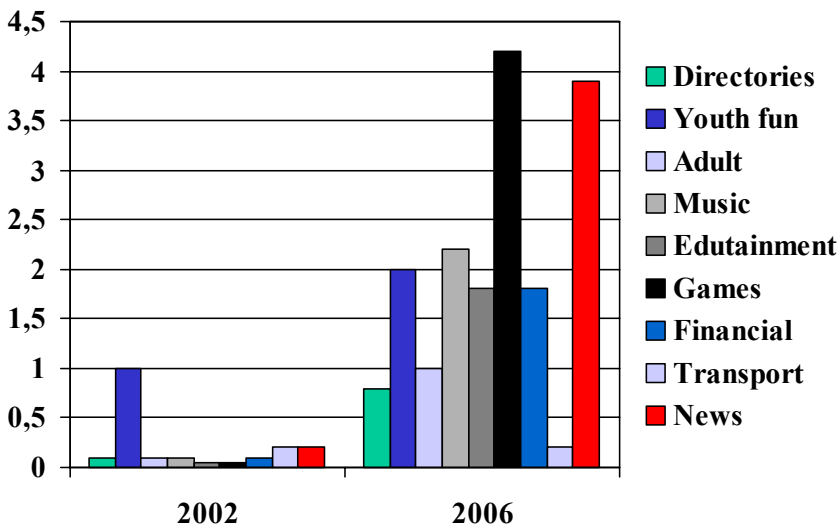

Fig. 2. Market size of content-centric mobile data applications 2002–2006, yearly revenue in EUR (Source: European Commission 2002, p 4)

Although mobile content applications are expected to make up just 4.6% of total mobile operator revenues and 7.9% of total content provider revenues by 2005 it will drive the consumption of content on more traditional media.[4] Today, ringing tones and icon downloads generate the largest part of the mobile content revenues in Europe. This shows that Europe today is still far away from exploiting its digital content via mobile applications.

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[4] For further considerations see the chapter "Mobile Games: An Emerging Content Business Area" by Tommi Pelkonen in this book.

Nevertheless, providing content is seen as the most important value-added link in the value chain of mobile media and entertainment, as Figure 3 shows.
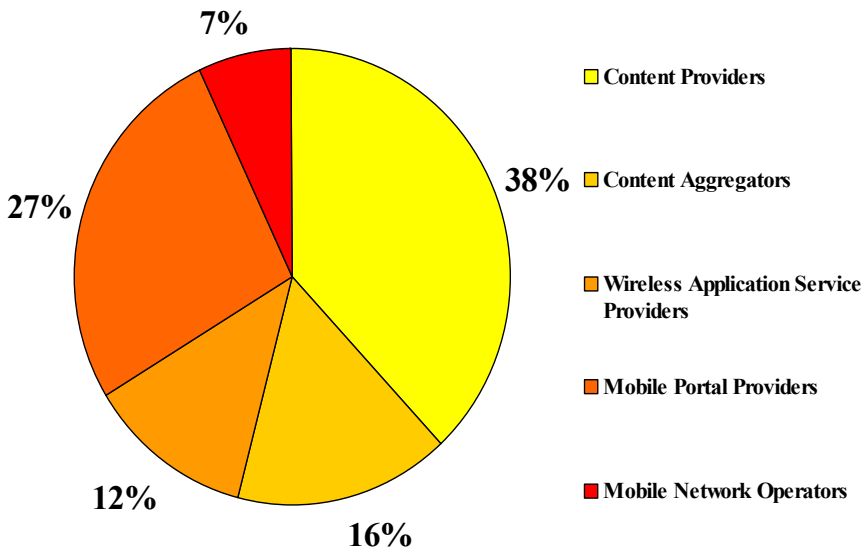
7%

38% ☐ Content Providers

27%

☐ Content Aggregators

☐ Wireless Application Service
  Providers

12%

☐ Mobile Portal Providers

16%

☐ Mobile Network Operators

Fig. 3. Average split of content fees between mobile media & entertainment value chain players (Source: Ericsson Consulting 2002)

The *European mobile content market needs to be created.* Everything must be invented to reach the forecasted € 18.9 billion market: services and applications, a value chain, interactions between players, business models and customer segmentation. The successful creation of the market requires that a set of convergent forces drives all players in the same direction. The European mobile communication landscape today is populated with numerous players – handset manufacturers, mobile network operators, content providers, etc. – each competing to lead the market and striving to own the customer relationship. As a result, there is a lack of cooperation and ongoing conflicts between content providers and mobile network operators.

There is another factor hindering the development of the European mobile content industry: during the last years, the industry faced some difficulties in providing affordable handsets with the necessary features to use mobile content services. Also, high 3G license and network infrastructure costs have forced operators to become even more cost conscious. This results in the scrapping or delay of investments in key enabling technologies such as billing system upgrades and user localisation systems. In addition,

mobile operators want to control the largest possible part of the value chain in the hope of increasing their revenues. This reduces operators' willingness to provide access to their platform to third parties. The limited availability of sophisticated handsets justifies that potential players adopt a "wait and see" attitude. Finally, the proliferation of standards for the packaging and transmission of content over mobile infrastructure requires players to spread their investment capability over multiple technical options.

It still has to be seen whether users will move to access E-Content via mobile devices, adding this kind of usage to the existing success of voice and text messaging. Some voices say that the majority of users have no real interest in paying for anything except inter-personal communication from mobile devices. With this comes the question still to be decided: Will professional marketing, useful applications, speed to market and intelligent pricing enable the mobile to become a hand-held "everything" device? Or will health scare factors, lack of investment in networks and the dominant market position of telcos who are incapable of creating attractive content be predominant? These are the factors which will influence the take-off of mobile content in Europe.

4 Technological Trends and Challenges

4.1 Broadband and Its Implications for Europe

As already mentioned, there is a major trend in the European ICT landscape towards broadband connections. After incumbent telecom operators were summoned to unbundle the telephone line, dial-up started to disappear. The *advantages of broadband* were immediately apparent: It is much faster, the connection is always up; dial up and check in are no longer needed. And broadband is having – besides its core function to have a high data throughput – a major impact on the way people consume media at home in general. Certain content types – namely audio and video applications – have become common to download or consume via streaming modes, almost like broadcast media. Broadband technology will thus bring new market opportunities for multimedia solution providers and E-Content providers.

But while all European countries are developing their own IT industry and are working on improving their abilities in this area, the establishment of the *communication infrastructure differs between the European countries.* Especially with regards to the spread of broadband technology the penetration, adaptation and acceptance differs between the EU member states. Countries like Sweden, Denmark or the Netherlands are leading

when it comes to the proportion of users connecting at home via broadband, while other countries like Germany or the UK show an intermediate broadband penetration. Almost all of the new member states (with the exception of Estonia) lag considerably behind (Empirica 2003, p 12). But even by 2007 only 27% of European households will have broadband connectivity, compared to 50% of North American households (Forrester Research 2004, p 190).

Even if falling prices will propel the European broadband market (PwC 2004), user behaviour will not change over night and stick with some of the traditional suppliers of content, particularly TV channels. The limited broadband market means that European developers will have less experience of engaging with broadband users and emerging markets than developers in markets with quickly growing broadband penetration. Underdeveloped local and regional markets for broadband network supply, dominated by one or two players, will persist. This creates huge *access barriers and power imbalances in market transactions for content producers and suppliers* who are not in the cross media business. Companies who do not have privileged access to a relationship with a broadband network provider are largely shut out of the market and have little or no alternatives open to themselves. This is particularly discouraging as policy makers are keen to advertise the gains in broadband penetration and usage. Producers thus are faced with a regional lack of competitiveness in the access to broadband networks. This turns out to be a challenge on a European scale and needs to be solved.

4.2 Mobile Content

The realm of mobile business is the new frontier of the digital economy (Stanoevska-Slabeva 2004). Looking at today's situation, altogether 1.3 billion people use cellular phones worldwide (BITKOM 2004, p 12). These are *more users than fixed networks ever had.* With a highly flourishing zone in Asia, it is estimated that the 2 billion barrier will be taken by 2008. With 242 million users of mobile phones in Western Europe, they too have become important carriers of content (European Commission 2002). This is largely due to the technological development of mobiles that turned them into mini-computers and multimedia devices. Mobile Content started off with text messaging, but step by step new services were possible, e.g. mobile games. In a recent study, market researchers Frost & Sullivan (2004) have estimated that the yearly revenue for mobile games in Europe will increase up to € 6.3 billion until 2006, thus climbing from just