teGeorg-August-Universität Göttingen

Institut für Wirtschaftsinformatik
Professor Dr. Matthias Schumann

WI2 WIRTSCHAFTSINFORMATIK II

Platz der Göttinger Sieben 5
37073 Göttingen
Telefon: + 49 551 39 - 44 33
+ 49 551 39 - 44 42
Telefax: + 49 551 39 - 97 35
www.wi2.wiso.uni-goettingen.de

Working Paper No 14/2006

Svenja Hagenhoff

Current Challenges in the Media Industry and ICT based solutions

Outline

List of figures

List of abbreviations

ARD	Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland (the ARD is an amalgamation of the broadcasting stations of the German States. It runs the First German National TV Channel)
ARL	Association of Research Libraries
BOAI	Budapest Open Access Initiative
BSA	Business Software Alliance
CMS	Content management system
CR	Concentration ratio
CV	Conventional puplication
DRM	Digitals rights management
FAZ	Frankfurter Allgemeine Zeitung (Frankfurt Newspaper)
ICT	Information and communication technology
iTV	Interactive television
MHP	Multimedia home platform
OA	Open Access
OAI	Open Archive Initiative
ODRL	Open Digital Rights Language
P2P	Peer to Peer
PoD	Print on Demand
REL	Rights Expression Language
SUB	Niedersächsische Staats- und Universitätsbibliothek (Göttingen State and University Library)
VDZ	Verband Deutscher Zeitschriftenverleger (Association of German Magazine Publishers)
VHB	Verband der Hochschullehrer für Betriebswirtschaft (Association of University Professors of Management)
w.a.	without author
ZDF	Zweites Deutsches Fernsehen (Second public service television station in Germany)

1 Introduction

The business of the media industry is creating, bundling, and distributing information- and entertainment content (Schumann/Hess 2005, p. 1). This industry is affected very strongly by innovations in information and communication technology (ICT) because the products could completely be digitalized and distributed via digital networks. This affects the inner processes of the media companies as well as the design of the products and value structures.

The following aspects as examples spell out the media industries current situation simplistically:

- With the help of new distribution channels such as P2P networks established value chains could completely be bypassed. This could be done not only in case of music, but even in case of scholarly communication. For example the Open Archive Initiative as a worldwide virtual scholarly library is trying to break down the quasi monopolies of scholarly publishers.
- ICT companies are entering the media industries core markets (e.g. Apple). They want to cover as much of the value chain as possible, if necessary with the help of strategic alliances.
- Within the last years the number of devices has arisen (eBooks, PDA, cell phones, set top boxes, etc.) each of which needs specific transmitting and storing media. The media industry needs to identify the right device for each specific target group. It also needs to convince the recipients of the benefits and the use of the new offers.
- New technologies are changing processes. An example is print on demand. Instead printing very large number of copies (first copy costs!) which need to be stored somewhere the publishers can print much smaller numbers of copies even batch size one, and moreover they can produce customized products such as an individually bundled guidebook.

It is the aim of this working paper to describe the state of the art of ICT innovations in the media industry. Mainly this means to examine the possibilities to create products and to organize value structures (ICT as enabler) and less to treat ICT as a means like text processing or graphics program within a single company.

The paper is structured as follows: First, a clarification of terms is presented. Moreover media companies and media markets are characterized in general, and the characteristics of information goods are presented. Second, the current challenges are analyzed. Third, ICT based solution possibilities are systematized and explained. Last a final statement is given.

,

2 Basic terms

2.1 Media industry

Companies of the media industry create content and distribute it to their recipients with the help of media and different distribution channels. The typical value chain within this industry consists of the steps creating or procuring content, bundling content in order to get an information product like a newspaper, and distributing the product (see Figure 1, Schumann/Hess 2005, p. 12).

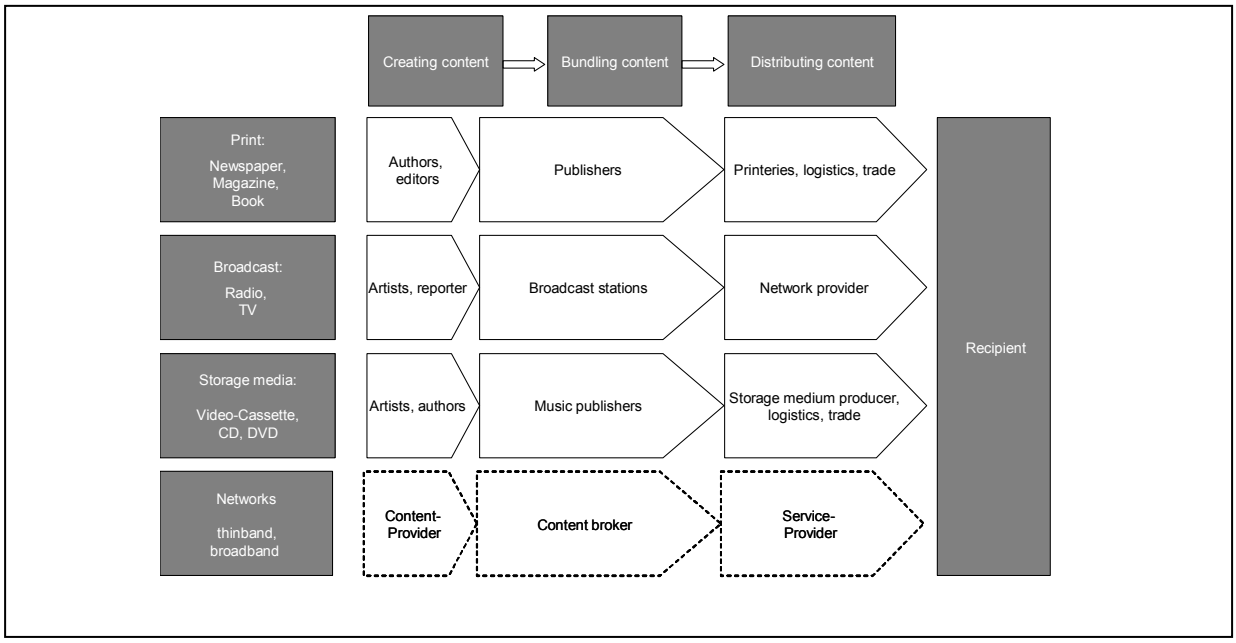

Figure 1: Typology of media companies

The media market has two segments: markets for non-electronic media (print markets) and markets for electronic media such as TV, radio, music, internet. At the demand end of the value chain the media market is a so called double-sided market: There are two kinds of customers, the recipients and the advertising customers. From the recipients the media industry gets revenues by selling the content. The advertising customers give money for carrying the advertising messages. This advertising space on the one hand must minimize losses due to scattershot approaches, and at the other hand it must cover the target group maximal (Schumann/Hess 2005, p. 30). Procuring the content basically means to transfer the property rights. While transfers of the property rights of attractive content, like sports reporting or pictures of stars, often are very expensive, the procurement of scholarly information such as needed for papers or textbooks, in general does not have monetary costs. See the following figure for the media market differentiation (similar to Wirtz 2005, p. 21).

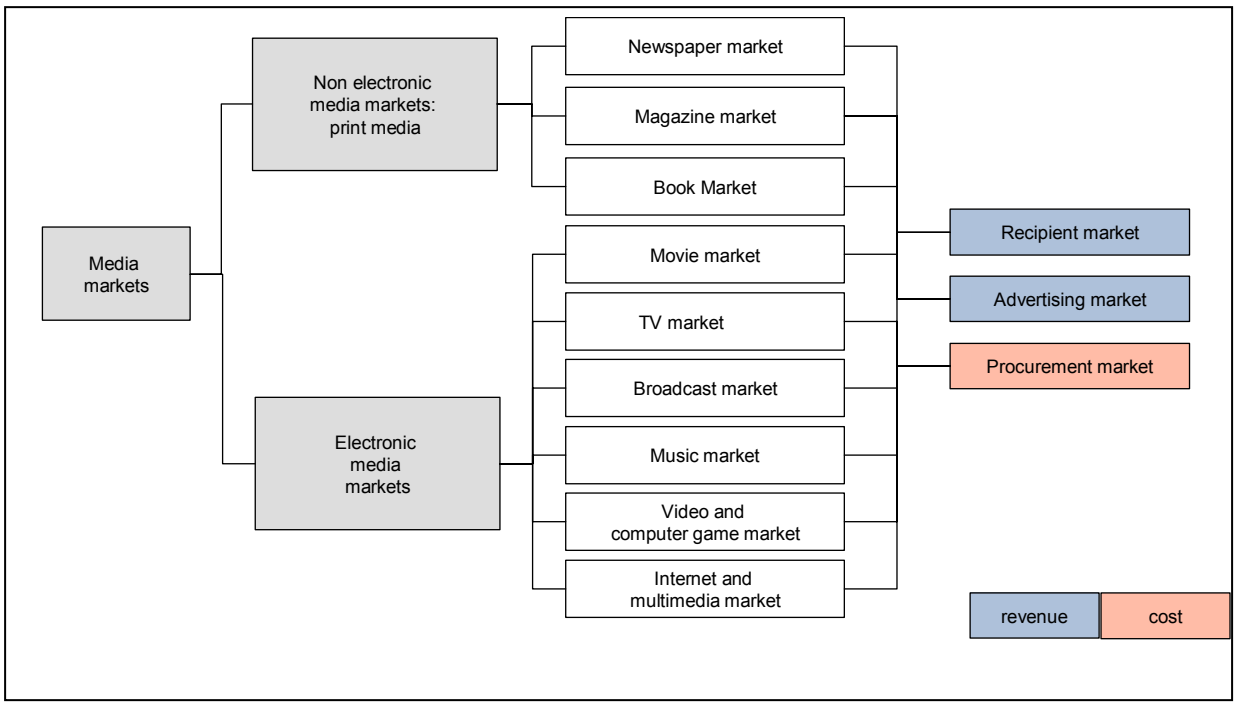

Figure 2: Structure of media market

2.2 Content and information good

In the literature we find a lot of definitions for the term *content*. Often terms such as information, information good or digital good are also used. Some definitions as examples are listed below:

- **LOEBBECKE** uses the term o*nline delivered content* and defines: "data, information, and knowledge traded on the Internet or through other on-line means". As examples she lists online magazines, online music, online education, searchable data sources, consulting, expertise (Loebecke 1999).
- **EITO:** "[…] distinguishes between three key types of online content according to the principal access platforms: PC-based, TV-based and mobile" (European Information Technology Observatory and European Economic Interest Group 2005, p. 92).
- **WITTMANN** defines *information* as knowledge used for specific purposes. This means knowledge is used to prepare actions (Wittmann 1959, p. 14)
- **SHAPIRO / VARIAN:** "We use the term information very broadly: essentially, anything that can be digitized – encodes as a stream of bits – is information. For our purposes, baseball scores, books, databases, magazines, movies, stock quotes, and Web pages are all information goods" (Shapiro/Varian 1999).
- **KOTKAMP:** Information is a […] digital message, which is significant for the addressee and which has effects on the addressee (Kotkamp 2001, p. 44).
- **ZERDICK ET AL.** define a *information good* as: "media content or software which can distributed via internet because they are digital" (Zerdick et al. 1998, p. 148).

- **BRANDTWEINER** says that an *information good* is a good that is bought because of its content. The good is the content, the message, the knowledge itself. Examples are books, encyclopaedias, newspaper, magazines, and manuals (Brandtweiner 2000, p. 37).
- **LINDE:** *An information good* is an amount of data, which is presumed as useful by people acting in economies. (Linde 2005, p. 7).
- **KASPAR** says that *media goods* are representing the output of a media company (Kaspar 2006, p. 10, original in German).
- **CLARKE:** „Digital goods and services are those that can be delivered using the information infrastructure" (Clarke 1999).

We can see that we need to get a precise version of the relevant terms and therefore we need a systematic approach. A very high degree of systematization is given by MOWSHOWITZ. In his chinese box model of information goods he distinguishes several levels a information good consists of (Mowshowitz 1992, p. 234 ff.):
The *core / kernel* of the information good is the information itself. MOWSHOWITZ defines this as the capability to decide and to control. With KOTKAMP we can say that this definition is to narrow, because it is only good for economic purposes (controlling or managing a company). This would mean that information goods with entertainment purposes (soccer results) or educational purposes (textbooks) were not included (Kotkamp 2001, p. 42 ff.). The definition of KOTKAMP, which is neutral in terms of purposes, allows comprehensive interpretations and therefore it is much more useful in the case of media industry than that one of MOWSHOWITZ. The term *content* can be used as a synonym.
In order to transmit the information we need to *store* it. For this, different media exist, like for example paper, hard disks etc. In addition, a *method* is needed to get access to the medium.
Information can be reorganized (collected works of an author), updated, displayed in a new way (graphic instead of table) or browsed. MOWSHOWITZ calls this activities *processing*.
The way of *distribution* can have influence to the value of the information. A quick distribution is needed in case of news with high relevance to the current situation. Ideally, sending and receiving of the message do not have a time lag.
A decoded *presentation* of the information is needed for the recipient to understand it.

As MOWSHOWITZ has shown, the value of an information good does not only depend on its content kernel content but also the means for getting access to this kernel can be important. But, with BRANDTWEINER we can argue that a recipient will buy an information good only on the basis of the content kernel, but of nothing else. With the help of this line of talk information goods can be distinguished from digital goods, which consist of bits. Digital goods can have content (e.g. PDF document), but they do not need to have it (e.g. software, main purpose of software is data processing and administration, but not carrying content).

Finally we can stress that information goods (as just defined) are the output of media companies (Kaspar 2006, p. 10).

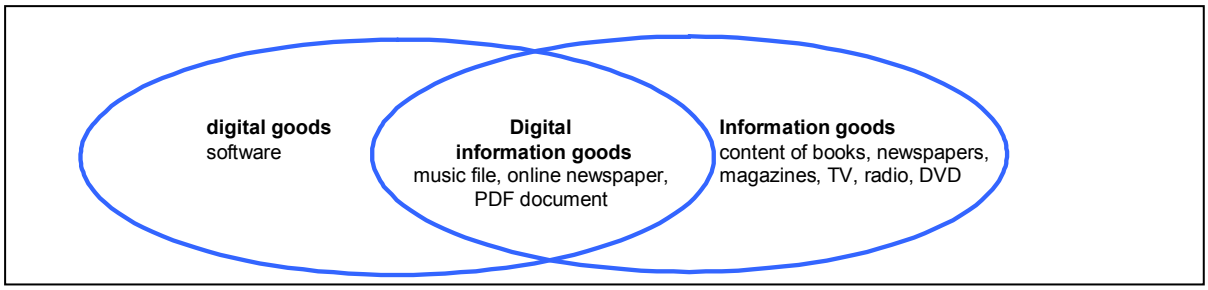

Figure 3: Differentiation of information goods and digital goods

3 Current challenges in media industries

3.1 Decreasing recipient and advertising revenues

After a rapid growth at the end of the 1990s we can see a strategic threat of the media industries core business if not an enduring threat to their existence because of dramatically decreasing revenues (Kaspar 2006, S.1; analogue Friedrichsen 2004).

At the advertising markets there are decreasing revenues of 12 % within the years 1998 to 2004. Especially the print market is affected (-19 %), and there especially the market for professional journals (-25 %) and the market for newspapers also (-23 %). Compared with that, the market for electronic media shows constant revenues. The table and the chart below show the advancement of the advertising revenues in Germany (data from Verband Deutscher Zeitschriftenverleger 2005, also Schenk/Wolf 2004).

	1998	1999	2000	2001	2002	2003	2004	Variation 2004 to 1998 in %	Variation 2004 to 2000 in %
print media	**8,898.28**	**9,261.94**	**10,070.87**	**8,791.61**	**8,836.00**	**7,421.50**	**7,204.70**	**-0.19**	**-0.28**
popular magazine	1,868.98	2,006.51	2,247.32	2,092.45	1,934.00	1,861.50	1,839.20	-0.02	-0.18
professional journals	1,161.00	1,189.00	1,267.00	1,057.00	966.00	880.00	865.00	-0.25	-0.32
newspaper	5,868.30	6,066.43	6,556.55	5,642.16	5,936.00	4,680.00	4,500.50	-0.23	-0.31
electronic media	**4,671.41**	**5,084.48**	**5,591.08**	**5,332.01**	**4,748.00**	**4,636.51**	**4,750.77**	**0.02**	**-0.15**
TV	4,041.71	4,317.55	4,705.15	4,469.03	3,956.00	3,811.27	3,860.38	-0.04	-0.18
radio	604.70	690.93	732.93	677.98	565.00	579.24	619.39	0.02	-0.15
internet	25.00	76.00	153.00	185.00	227.00	246.00	271.00	9.84	0.77
total	**13,569.69**	**14,346.42**	**15,661.95**	**14,123.62**	**13,584.00**	**12,058.01**	**11,955.47**	**-0.12**	**-0.24**

Figure 4: Advertising revenues in Germany from 1998 to 2004 in € (tabular)

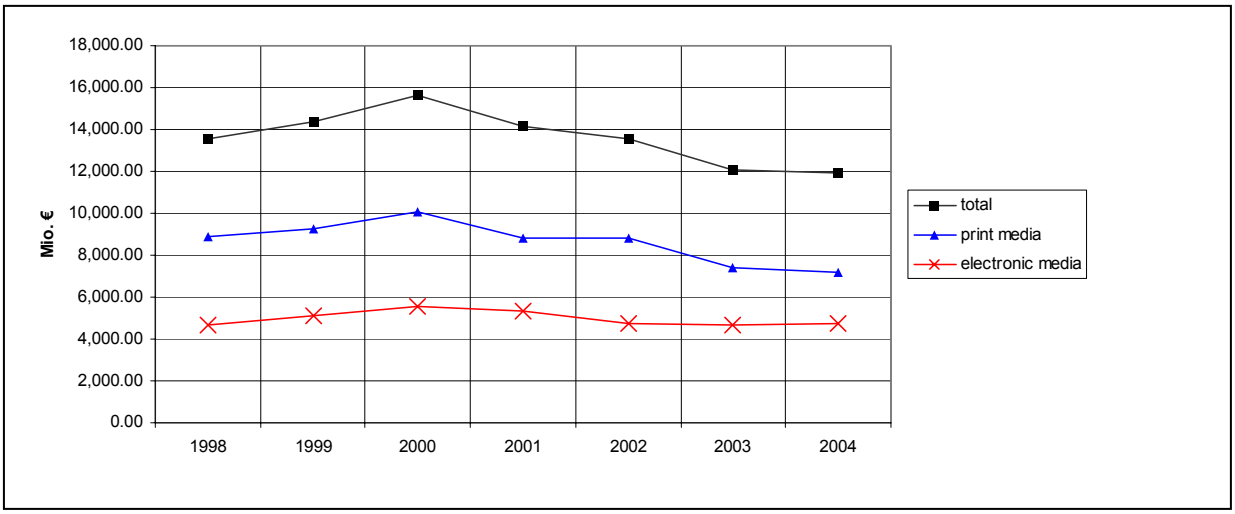

Figure 5: Advertising revenues in Germany from 1998 to 2004 (graphic)

There are different reasons for this situation: shrinking average number of copies (magazines) and shrinking scopes (TV, radio). The cause for the shrinking average number of copies is the increasing number of titles (+20 %) where the progression of the number of copies was constant. The increasing

number of titles is caused by a differentiation of the recipients interests (e.g. a lot of specialized magazines have arisen the last years). In the case of newspapers the shrinking scope is caused by shrinking interests especially of younger readers. The shrinking numbers of copies / scope is negative for the media industry because media are only attractive for advertising customers if they cover the target group maximal (Schumann/Hess 2005, p. 30).

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	variation 2004 to 1995 in %
number of copies in million	125	128	127	127	124	124	125	126	125	124	-0.01
number of titels	709	758	778	809	839	847	817	831	832	850	0.20
average number of copie in million	0.1760	0.1684	0.1635	0.1564	0.1481	0.1469	0.1531	0.1516	0.1507	0.1455	-0.17

Figure 6: Progression of the average number of copies of magazines in Germany (without professional journals, tabular)

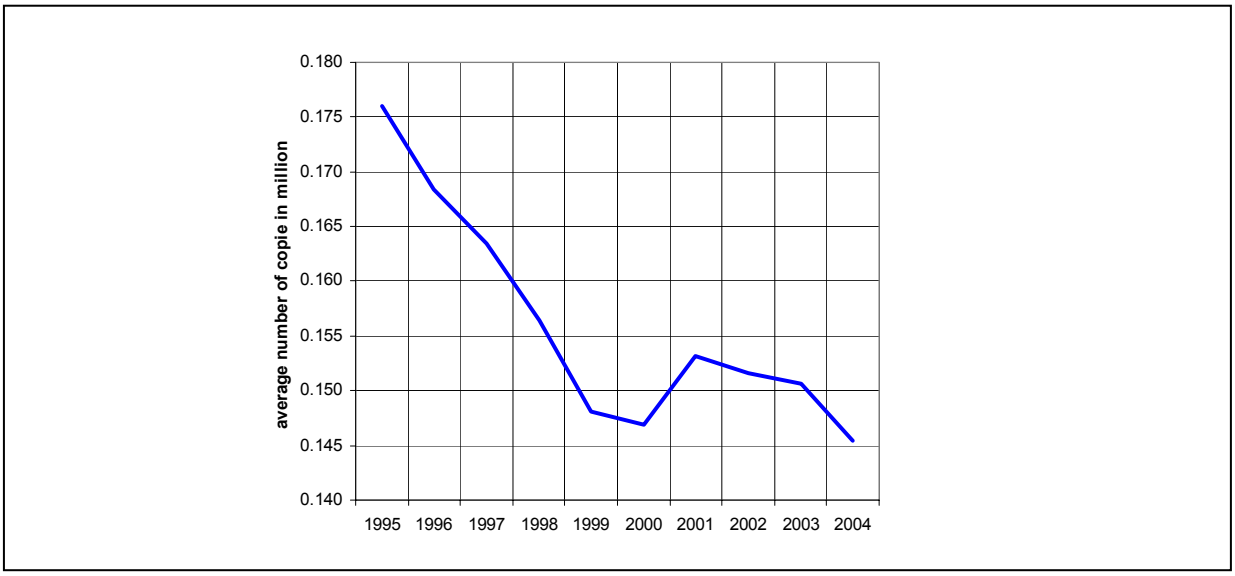

Figure 7: Progression of the average number of copies of magazines in Germany (without professional journal, graphic)

Recipients drop in turnover we can see mainly at the music industry. The numbers of the German section of the International Federation of the Phonographic Industry (IFPI) show a shrinkage of the revenues of recorded sound storage media (-39% from 1997 to 2004, see figure 8). Piracy is the main reason for this, as the IFPI says. A German survey discovered that 80.5 % of all Downloads in 2004 in Germany were illegal (Gesellschaft für Konsumforschung 2005, p. 16). This survey also shows that the sale of music albums decreases around 33 % from 198 million units to 133 million units, while the sale of blank CDs increases about 450 % from 58 to 317 million units. In opposite, in the study of OBERHOLZER und STRUMPF, which is controversially discussed because of its methodology, it is argued that the file sharing systems are not responsible for the decreasing music revenues, because the users of those systems are no customers of regular music sale anyway (Oberholzer/Strumpf 2004, for criticism see Liebowitz 2004).

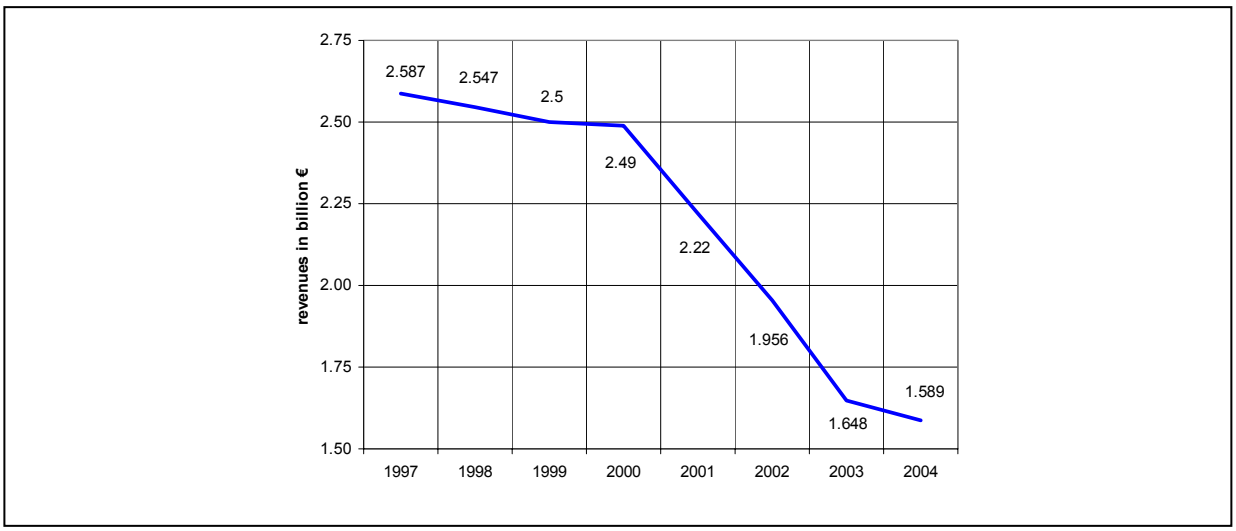

Figure 8: Progression of revenues in music industry

Movie distributors, cinema people, and some market research institutes argue that also the movie industry has to accept decreasing revenues (z. B. Deutsche Presseagentur 2005, Wehn 2005, Corinth 2005, w.a. 2005a). But the analysis of the cinema statistic within the last 10 years shows something else (data from Filmförderungsanstalt 2005): While the average ticket price was increasing about 18 % from 1996 to 2004 (the increase of ticket prizes because of inflation would have been 13.84 %), the revenue was increasing about 33 % and the number of visitors was increasing about 18 %. Dramatically shrinking revenues cannot be identified because of this numbers. Both, number of visitors, and revenues certainly had a peak about 34 % resp. 47 % in 2001 in comparison to 1996. Referring to this year (2001) revenue and number of visitors decrease about 10 % resp. 12% while ticket prizes decrease about 3 % (because of inflation this would have been 4.53 %). More than the identified revenue progression it is alarming that the movie production costs have arisen about 40 points from 1996. Taking into consideration the revenue progression since 2001 we have to notice that the cinema revenues help less and less to fund a movie (Schulze 2005, p. 64).

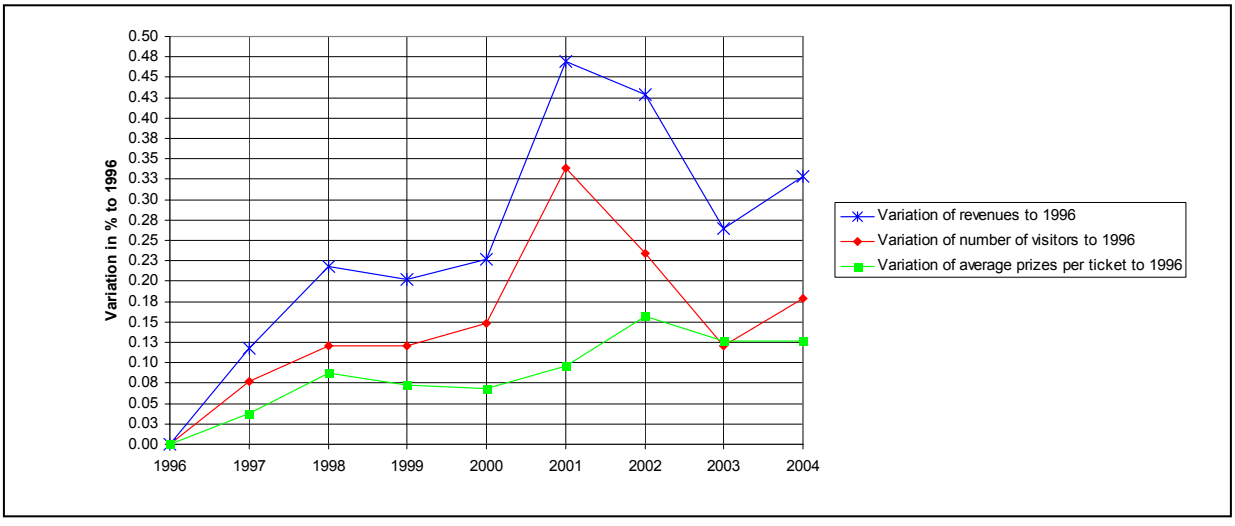

Figure 9: Cinema statistic 1996 to 2004

Reasons that are given for he latest shrinking revenues are the increasing attractiveness of DVD (Price Waterhouse Coopers 2005), and the unattractiveness of the movie's content (Rosenbach 2005).

3.2 Increasing prices for scholarly information

Within the last years we can identify greatly increasing prices for scholarly journals, which are many times over the rate of inflation (Woll 2005, p. 14, Seidenfaden/Ortelbach/Hagenhoff 2005, p. 26). Experts call this situation the *journal crisis* (z. B. Woodward/Pilling 1993, Bargheer 2006, Meier 2002). The Association of Research Libraries (ARL) has investigated an increase of the average serial unit costs about 188 % from 1986 to 2004 (see Figure 10, Association of Research Libraries 2004). In average this is a rise about 6.3 % per year. Find more analyses with the same tendency at Griebel/Tscharntke 1999, Bergstrom 2001 or Orsdel/Born 2003).

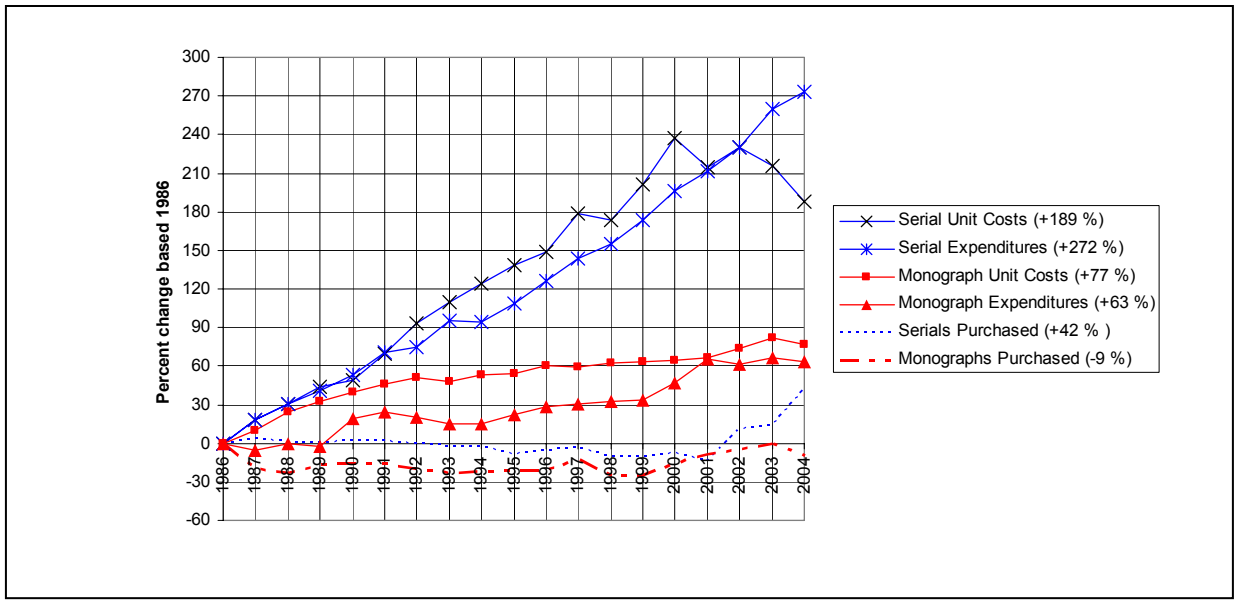

Figure 10: Progression of prices for journals and monographs

The ARL analysis shows that financial resources for the procurement of the expensive serials partly are dispensed with a reducing of monograph procurement (decreasing units about 9 %). This also is shown by an analysis of the Göttingen State and University Library in Germany.

In literature we can identify the following aspects as reasons for this situation:

1. The disciplines became more and more specialized within the last years. For this, the number of specialized journals increases continuously, each of which only has small target groups (Keller 2005, p. 23, similar Meier 2002, p. 25 ff.). Because of the specific cost structure of the media industry – high fix cost, low variable costs, and low marginal costs – small numbers of copy naturally lead to high unit costs.
2. The structure of the market, which is characterized by three phenomena:

a. In the case of scholarly information we cannot substitute the information products, nor from the authors point of view, neither from the readers point of view. For the work of scientists it is essential, that the scientist reads the core journals of his discipline. He cannot use other journals, which are less relevant. Because of this publishers hold a quasi monopoly. As well it is essential to publish in those relevant journals. Extremely, there is maybe only one relevant journal. For example, the German Association of University Professors of Management has identified only a single German-speaking journal in the field of business information systems which is highly ranked. From the authors point of view the market also at best is an oligopsony, maybe a monopsony.

b. At the market for scholarly information we can find a high concentration. In 2004 the 5 most high-volume publishers in Germany, Austria, and Switzerland had a turnover about 51 % of the total revenues (CR-5 = 51.81 %, there are about 30 publishers in this market segment, see Figure 11). Since a couple of years we can see an intensive international market restructuring, which especially means mergers and acquisitions by big market players. For example, Reed Elsevier bought Pergamon Publishers in 1991 and with this Elsevier extended its portfolio with 57 ISI-listed biomedicine journals. Over the course of 1998 Wolters Kluwer added 100 ISI-listed journals to its own 112 journals in the same discipline (those examples and more: McCabe 2002, p. 262). 2003 the science segment of Springer was sold to the consortium of Conven and Candoyer, which also owns Kluwer, and the science segment of Bertelsmann (Bargheer 2006, p. 178, similar Hoch 2003). Reasons for this high concentration are the aspects which are mentioned at a). It is important to point out that theses aspects are inherent in the system of scholarly communication. In addition, the concentration ratio is tightened up because of the M&A. To sum it up, we can say that the structure of this market is single-sided positive for the publishers, which have a strong position of power on both, authors as suppliers of knowledge and findings, and the institutional (libraries) and individual (scientist) demand.

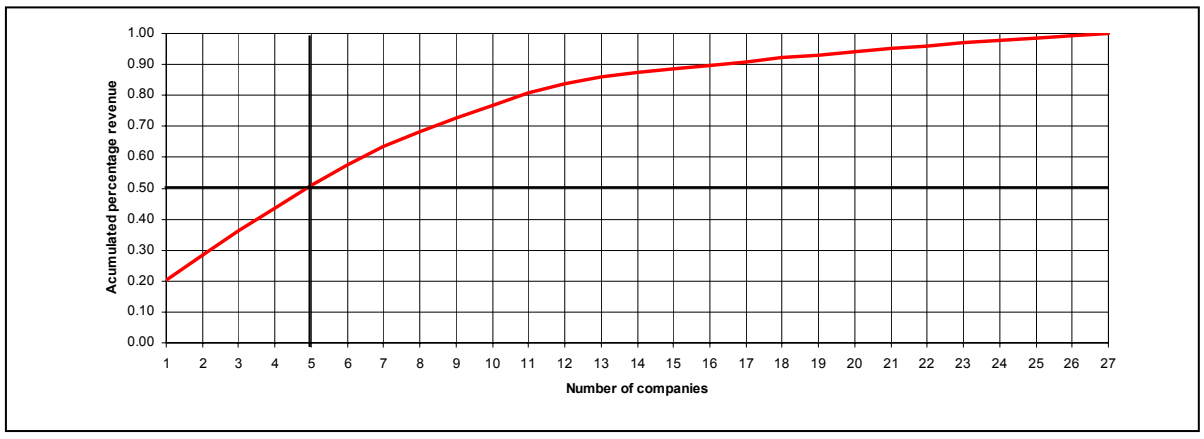

Figure 11: Percentage of revenues 2004, 27 German-speaking scholarly publishers accumulated

c. Compared with any other value chain, the value chain of scholarly information is special: The authors of the papers as suppliers of the “raw material” of the information products do not get any money for their work from the publisher. However, the publishing process causes costs which

need to be covered by selling the information products. Scientist or libraries as institutional demand therefore have to buy those products. HANEKOP and WITTKE call this fact the commodification and decommodification of knowledge (figure Figure 12, Hanekop/Wittke 2006, p. 217). It is the job of the libraries to supply scientist and students of a university with literature. Because of this task libraries cannot act in line with the market by stopping to buy the overcharged literature (Bargheer 2006, p. 179). In spite of the increasing prizes the number of the libraries literature acquisitions stayed constant within the last years. This means that libraries have very small prize elasticity.

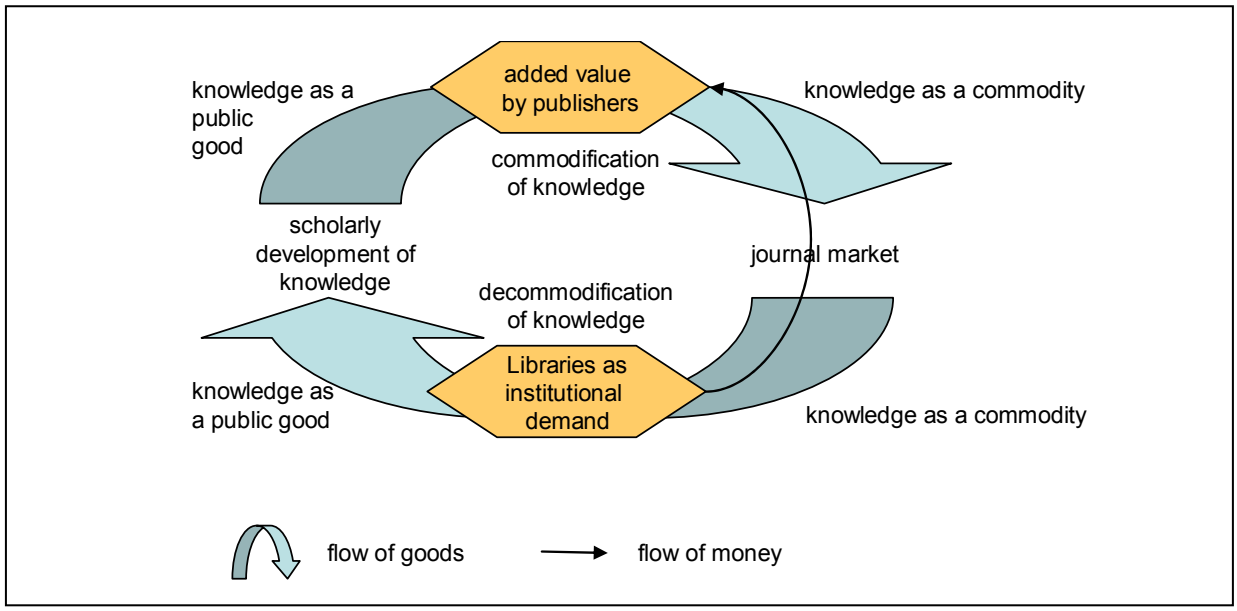

Figure 12: Commodification and decommodification of knowledge

3. The publishers fix costs have increased: The publishers themselves say that reasons for this were on the one hand ICT investments, at the other hand the increased efforts within the review processes. ICT investments were needed in the field of electronic publishing (parallel online version, long-term archiving of electronic material, powerful search engines, (Meier 2002, P. 31, Haank et al. 2004, p. 145)). Though, the publishers do ICT investments only since the internet boom in the middle of the 1990s. However, the prices are increasing since the 1980s and therefore MEIER says that the technology investments are not a cause, but one of many facets of the journal crisis (Meier 2002, p. 31). The increased time of the review process is caused by an increased rejection quote within the last years (Meier 2002, P. 32). This again is caused by the increased obligation to publish (publish or parish) and the increased number of scientists (Meier 2002, P. 25 ff.), which causes a higher volume of publications (Ball 2000, Kiefer 2003, p. 39).

3.3 Appearance of new market players

Within the last years new market players entered the media market (similar Pagel 2004, p. 297). Exemplarily we can mention the encyclopaedias Wikipedia or Microsoft's Encarta, the Google initiative

Google Print resp. Google Book Search, or the music stores iTunes (Apple) and musicload.de (T-Online), which are all not belonging to the media market originally.

As a reason for the appearance of the new market players we can identify the completely digitalized value chain of the media market. Because of this, the structural market entry barriers are lower than in former times, when one has to establish costly physical infrastructure and distribution channels. Though, we cannot see the media companies building up any strategic market entry barriers.

More interesting than the given reasons are the consequences of that situation:

1. New market players can be attractive for the customers of the established market players. This again means shrinking revenues at both, the advertising market and the recipient market. In Figure 4 we can see that a part of the advertising expenditures were transferred from the established media to the new media within the last years. In case of constant numbers of customers new market players ceteris paribus bring less average revenues.
2. New market players are attractive for new target groups which till now were not customers of the established media companies. For example, young internet users who grew up with the Wikipedia will not buy an expensive encyclopaedia like the Britannica. So, those younger people maybe do not take their place as new customers of the old media companies. For this reason there are long-time shrinking recipient revenues and therefore also shrinking advertising revenues.

Both described effects are not different in general from the shrinking revenue challenge mentioned in chapter 3.1. Therefore we can say that new market players are just another reason for decreasing revenues, which certainly could be a long-term challenge.

3.4 Piracy as a trivial offence

Above we mentioned that media companies, especially music companies, face to less revenues because of piracy. A 2002 German study shows that of 4.9 million persons asked only 6 % have downloaded fee-based songs (Gesellschaft für Konsumforschung 2002). In the 2004 study they mentioned a number of only 2 % (see chapter 3.1). Because a business only will be run in case of recompensing the employer's risk, we can presume that intensive illegal behaviour will cause a tremendous market failure in case of each kind of digital products (Gehrke 2004, p. 125). Digitalization and technologically simple copying of those products cause abuse by sections of the population in a never known breadth (analogue Hachenberger 2003, p. 3, Institut für Strategieentwicklung 2004, p. 1). GEHRKE/BURGHARDT/SCHUMANN use the term *spontaneous piracy* in order to differentiate private copying from illegal institutions which organize copying in a big way (Gehrke/Burghardt/Schumann 2002). The authors mention, that the organized copying in the long run could be substituted by the spontaneous copying.

The following reasons are identified fort the worldwide high degree of illegal behaviour:

1. Copying digital goods is technologically simple. There are no technical or financial hurdles needed to overcome. RINGLSTETTER ET AL. mentioned that in case of digital goods costs and complexity of

producing a copy in opposite to other products and times are so less that the private production of copies is feasible. In former times only publishers, printers, and logistic companies have had the capabilities to copy and to distribute material information goods such as newspapers because a lot of financial and technological resource and also entrepreneurial know-how were needed (Siegrist 2003, p. 321 und p. 323).

2. Lack of comprehension of the law system: A German study about the reasons of illegal copying shows that those people do not follow their awareness of law. The asked persons do quite know that copying fee-based digital goods is a criminal offense. Nevertheless, they do not have the feeling of taking away something and therefore there is no feeling of theft (Institut für Strategieentwicklung 2004, p. 4). More than 60 % of the asked people said that they think that illegal copying is less serious than shoplifting.

3. Ineffectiveness of law systems: Especially in less developed countries we can find a high rate of piracy. This negative correlation of piracy and economic performance is shown in the figure below. There the quotient of income per head and piracy quote is ascertained for countries with particularly high piracy quote (more than 75 %) and those with particularly low piracy quote (between 20 and 40 %, data from Business Software Alliance 2005 and Brockhaus 2006). GEHRKE presumes that the law systems of less developed countries are working less effectively. The reasons for this could be that fact that there is no jurisdiction at all or that the prosecution does not work very well (Gehrke 2004, p. 93).

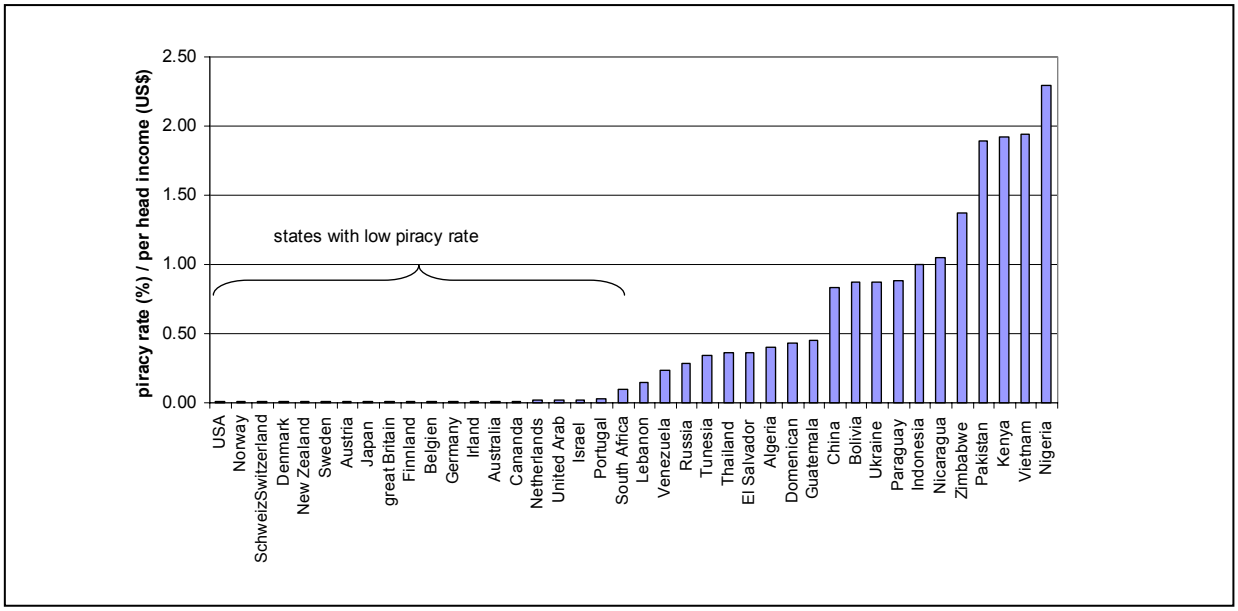

Figure 13: Correlation between piracy rate and income per head for different countries

Even in case of high developed countries we can presume a certain degree of ineffective law systems. Because the internet user are anonymous, the individual risk of being captured is small. This is called the *collectivization of risk* (Giesler 2003). In the above mentioned study 60 % of the asked persons say that they are not afraid to be caught. Moreover, P2P systems for technological reasons are difficult to grip.

4. Missing commercial offers: until the year of 2003 there do not have been any legal offers for song downloads. Users of illegal platforms argue that up to that time they did not have an opportunity to get the needed song legally (Becker 2004). Legal online stores are often criticized because of being too expensive, having too less songs, and using digital rights management (DRM). The table below shows the percentage of persons who would buy a song for a given prize for different kinds of songs (underlying price-demand function from Buxmann et al. 2005, p. 122). The survey of BUXMAN has discovered that 23 % of the asked persons think that the high prizes are the big problem of the legal download stores. 25 % would not change to a legal system if the illegal free systems would disappear. Moreover the study shows that most of the asked persons are not willing to accept DRM (Buxmann et al. 2005, p. 120).

	percentage of customers per kind of song			
prize in Eurocent	**current hit**	**elder title**	**rarity**	**newcomer**
79	18,5	11,5	43,1	12,6
99	10,9	6,7	33,4	7,0
129	5,0	3,0	22,8	3,0
149	2,9	1,8	17,7	1,6
199	0,8	0,5	9,4	0,4

Figure 14: Percentage of customers of digital songs depending on kind of song and prize

The consequence of intensive illegal behavior is a not inconsiderable economic damage. RINGLSTETTER ET AL consider that the economic logic of the production of digital goods lead to cost positions which for all industries being in the same position is a basic threat of their established business model. The authors are talking about the “napsterization” of the concerned industries. This is shown in the following figure (similar to Ringlstetter et al. 2005, p. 108[1]).

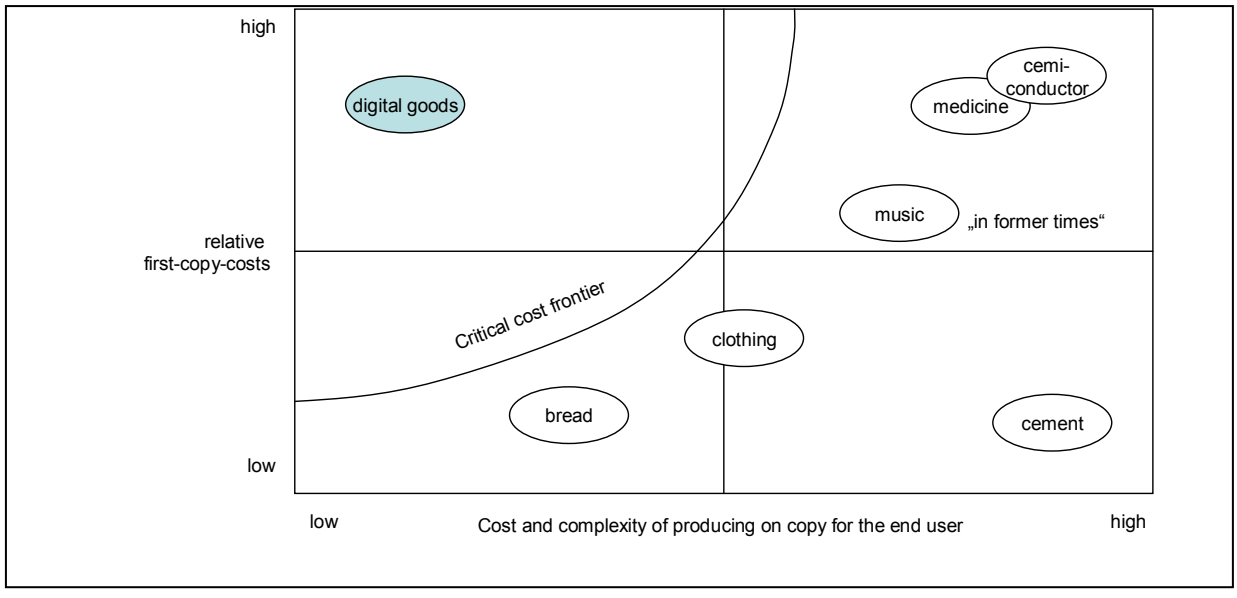

Figure 15: Industry-napsterization matrix

As a result we can stress that the suppliers of digital goods loose revenue because of piracy. But this is not only a current problem, but a very basic one, and therefore it will be a problem in the future.

[1] The authors relate the first copy costs to the potential revenue (relative first copy costs).

3.5 Summary of the challenges

The above explanations have shown that there are currently two big challenges in the media industry:

On the one hand we can identify both, **decreasing revenues** at the recipients markets and at the advertising markets. The following table shows the reasons which were identified and assigns them to the primarily concerned market.

Reason	Recipient market	Advertising market
Decreasing average number of copies because of media market becoming more specialized		X
Decreasing scopes of newspapers because of younger peoples' shrinking interests.		X
Piracy	X	
Attractiveness of DVD	X	
Appearance of new market players	X	X

Figure 16: Summary of the identified reasons for decreasing revenues

At the other hand tremendous **price increases** were identified in case of scholarly communication. The basic reasons or this are shown in the table below. The table classifies *strategy based* and *structure based* price increases. Structure based increases ensue from the characteristics und the functionality of the scholarly communication system itself. Those price increases are not the result of intentional actions of the media companies. The latter is a characteristic of the strategy based increases.

Reason	Structure based price increase	Strategy based increase
Small average number of copies because of discipline becoming more specialized	X	
Strong market power of companies because of monopolies and monopsonies	X	
Strong market power of companies because of M&A and high concentration ratio		X
Small price elasticity of institutional demand because of literature supply task	X	
ICT investments		X
More publication activities	X	

Figure 17: Summary of identified reasons for price increases

We can see that there are on the one hand challenges for the media companies as organizational units. They are interested in durable capabilities to survive. This is especially affected by the loose of revenues.

At the other hand we can find challenges for the media industry in general. Here also the demand or the society has special interests, for example to get knowledge via literature. Especially the price increases are important in this view.

4 ICT based innovations to face the challenges

4.1 Identification and systematization of ICT based innovations

To face the mentioned challenges the media industry can react in different ways. Principally, product innovations as well as process innovations are possible. Practice and theory in media industries have brought forth a lot of ICT based innovations, which are collected and classified in the following table. This collection is the result of continuous observation of that industry since the year 2000. Moreover, hardware and software solutions can be identified, which are means to put product or process innovations into effect. Those means are not discussed in this paper.

Theme	Product innovation	Process innovations	Means
Content management systems			X
Cross media publishing		X	
Digital rights management		X	
Digital video cassette recorder			X
Digital TV			X
Interactive information goods	X		
Mobile information goods	X		
Open Access and scholarly communication		X	
Personalization / individualization of information goods	X		
Print on demand		X	
Recipient as producer (procipient)		X	

Figure 18: Classification of identified ICT based activities in the media industry

Another systematic can be realized by assigning the innovations to the strategic options for actions which are well known from management literature. Basically, a company can optimize established fields of business, or it can open up new business segments in terms of new product-market combinations.

In the case of optimizing established businesses segments the company must produce added value in comparison to the current situation. For this, the company can reduce costs or increase revenues (ceteris paribus). We can reach the latter by product innovations, whereas cost reduction needs process innovations. New business segments can be established at the same stage of adding value (horizontal diversification), at upstream or downstream steps (vertical diversification), or in any other value adding system (diagonal diversification). This again can be realized by product or process innovations.

Those are the options for a media company. Also from the demand's point of view or the society's point of view a need of action was identified, which means to face the structure based price increases. Therefore structures need to be changed and new functionalities of the system of scholarly communication need to be discovered. Moreover, the discussion about the piracy as a trivial offence

has shown the basic risks of established business models because of napsterization. From the point of view of the concerned companies it could be desirable to transform structures as well. See Figure 19.

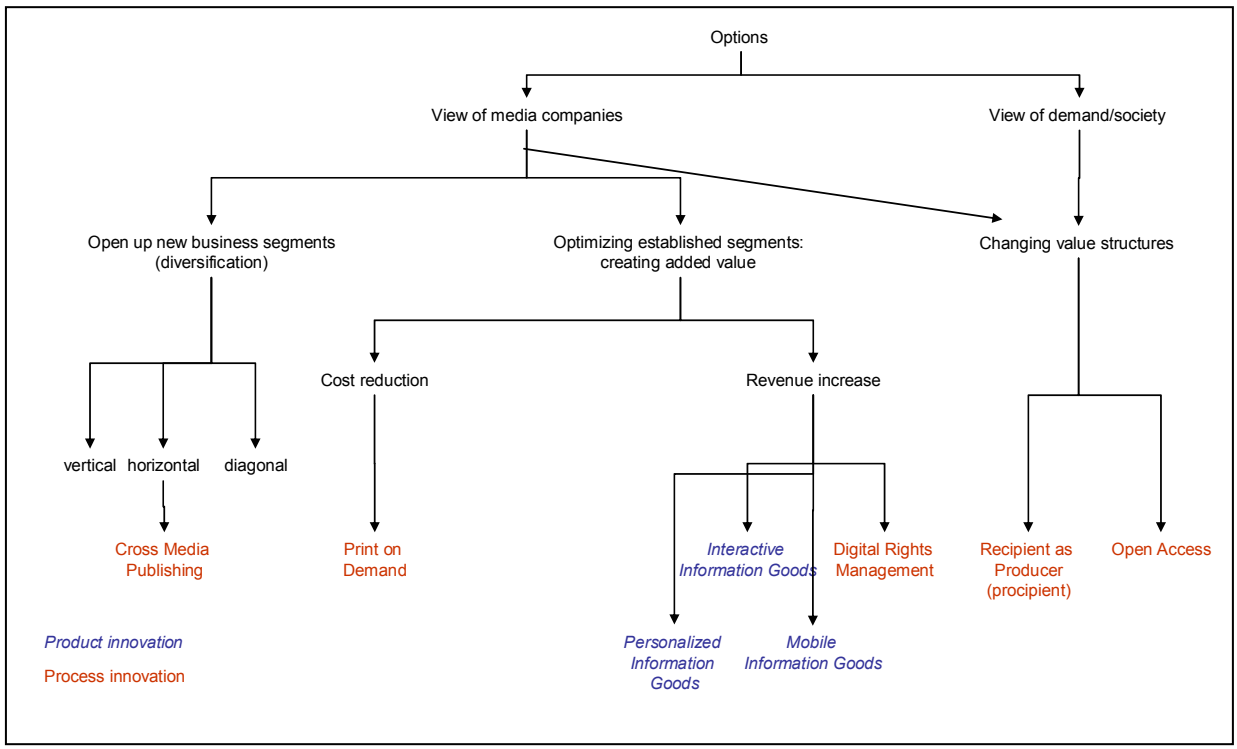

Figure 19: Systematic of the ICT based innovations

4.2 Product innovations

4.2.1 Personalized / individualized information goods

4.2.1.1 Idea

Usually the products of the media companies are standardized and identical for each recipient. We can define a personalized information good as a good which is an individual bundle of content. An example for this is the online newspaper *My Wall Street Journal*. The recipient can create an individual profile of interest by checking category boxes. Another example we can find at www.ciando.de which is a spin-off of Gabler, a very big German publisher of textbooks and scholarly monographs. Here the recipient can order single chapters of books (see following figure).

Figure 20: Examples for personalized information goods

The base for individual information goods is provided by the concept of mass customization, which for the first time was known in the manufacturing industries. DAVIS was the first who explained the term in 1987. He gave the example of the clothing industry. The concept can be explained with the help of the so called *ideal point model*. LANCASTER in his consumer theory explains that the customer's preference is focused to a product's combination of characteristics. The consumer compares those characteristics with the characteristics he desires (the so called ideal point). The closer the characteristics of the product and the ideal point are the higher is the consumer's preference for the product. In the case of anonymous mass markets the companies try to anticipate the potential consumer's ideal points and create product with characteristics which are close to an average ideal point. In the case of individualization the units of the product are designed in a way that their characteristics fit (exactly) to each individual ideal point (Piller 2001, p. 145 f., similar even Hotelling 1929). Companies acting in this way differ from theirs competitors (differentiation strategy according to PORTER). They can absorb the payment reserves because of nearly perfect price discrimination. In former times media companies need to produce a large number of copies because of the high fix costs. This compulsion of mass media production was inherent in the system, and is not needed anymore because of the new ICT possibilities. For example content management systems allow modularized storage of content, interactive networks allow knowing the consumers preferences (Hess 2004, p. 72 ff.).

The architecture of a system which allows producing individualized information products needs three components.

First, the *consumer's preference* must be captured in a so called user's model or preference model. There are two possibilities to do this: One way is to ask the recipient about is desires. This is done in the case of individual newsletters for example (by letting the recipient check the category boxes). Another way is to collect data by observation which means to observe the user's web page clicks. The data can be analyzed by the methods of web log mining. The result is the user's ideal point.

Second, the preference model needs to be *matched* with something *(inference mechanism)*. As an object for matching we can use the characteristics of the product. Therefore a so *called product model* (third element) is needed, which can be prepared by an editor, for example, in the case of the newspaper.

Another possibility for the matching is to use other user's preferences. The individual information good is generated because of structural similarities between different users. This way makes sense in the case the product cannot be described in a useful way or in the case the description of the good would be full of mistakes[2] and because of this it would be difficult to get a usable product model (Kaspar 2006, p. 125 ff.).

If we combine the both criteria, the way of collecting user data, and the object of comparison, we get four ideal types of individualization systems (see figure below, Kaspar 2006, p. 129).

		object of comparison	
		preference model / product model	**preference model / preference model**
way of collecting user preferences	**survey**	self selection	collaborative filtering
	Observation	content based filtering	observation based filtering

Figure 21: Kinds of individualization systems

It is not needed to explain the *self selection* further more. The mechanism of the *content bases filtering* uses automatic content analyses. For example, regarding content a text is characterized by its nouns. We can treat the noun profile of a currently used text as a search engine query and we can compare this profile with the article basis with the help of vector space models and the cosine measure. The *collaborative filtering* mechanism, as known by Amazon, compares consumption structures. The recommendation for interesting content is generated by differences between user profiles as shown in the next figure.

[2] This could happen if an automatic content analysis is used for generating the product model.

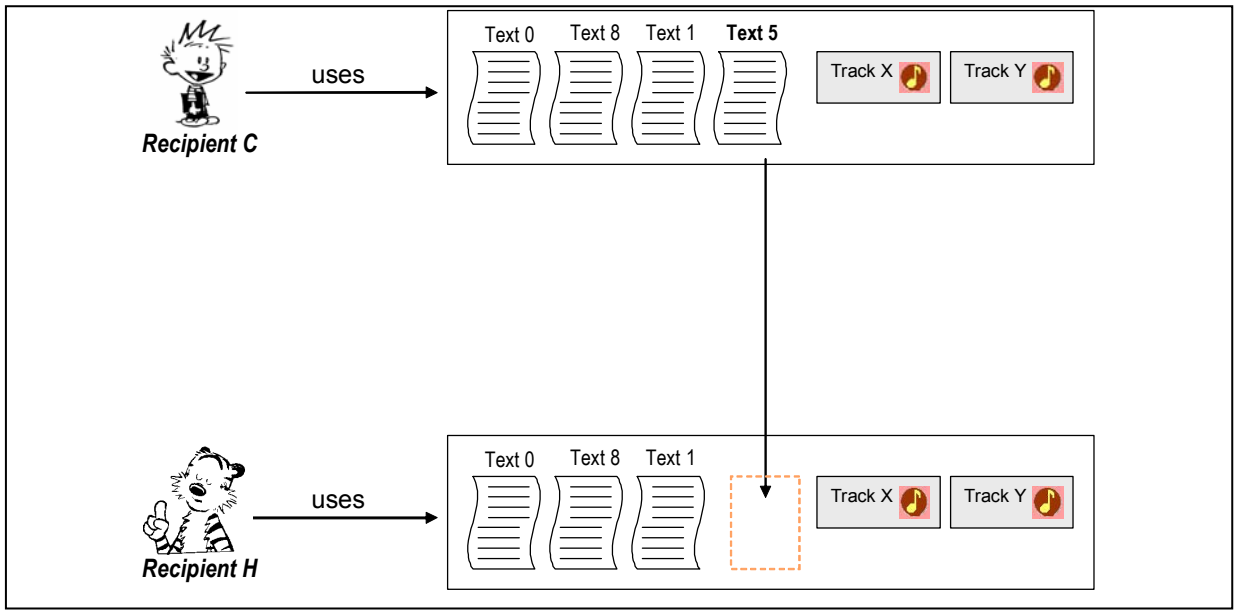

Figure 22: collaborative filtering

The *observation based filtering* uses an offline system and an online system. With the help of web log mining mechanisms in the offline system stereotypical click paths are identified and collected from historic data. The online system observes the users current clicks. Those are matched to the stereotypes. The x most probable ends of clicking are recommended dynamically. This mechanism is shown below.

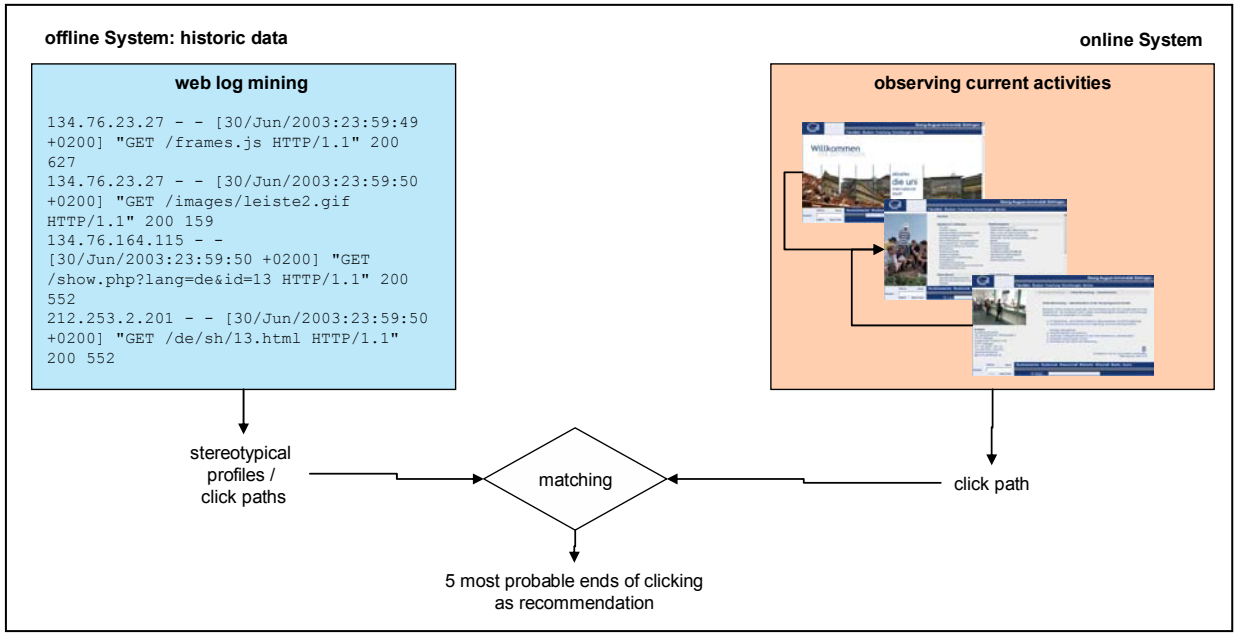

Figure 23: observation based filtering

4.2.1.2 Benefit analysis

We have to ask if personalized information goods have any benefit. Only in case of added value in comparison to standardized information goods the consumer would pay extra money for the individualized good. Though, in literature is only a few works which is about the benefit of such goods. It is true; there are some papers about the potential of individualized physic goods. But those results cannot be applied to information goods, as JACOB still mentioned that the effects of individualization are specific to each industry (Jacob 1995, p. 199).

We can distinguish between benefits for recipients and benefits for advertising customers. In the case of recipient benefits HESS collects some advantages as well as disadvantages (Hess 2005a). For the user of individualized information goods there are advantages because of the better match between the characteristics of the product and his preferences, why the user does not need that much time to search the content that fits to his interest. There are disadvantages or opportunity costs in terms of so called social costs. Those are for example a lack of communication because the consumer has read something else than his colleagues or friends. Other costs are monetary costs, cognitive costs (lack of surprise), and privacy costs. The ideal degree of individualization we can find in the minimum of the total costs. This analysis is more intuitive than analytically done. But it points to costs that are useful to analyze more deeply.

We can find a more complex analysis is given by KASPAR at the basis of the work of FINK. This analysis uses methods from microeconomics. The result is the following: If the individualized product causes less time to search for the content the user wants, the individual good is better than the standardized. This is the case if there is a lot of content the user has to browse in order to find the information he wants. We can stress that the extent of the data basis or the information basis influences the benefit of individual information goods.

Another microeconomic analysis is done by LINK und SCHACKMANN. Their argumentation goes from the supplier's point of view. They ask for the degree of individualization which maximizes the profit. The result is, that the optimal degree of individualization is the bigger, the bigger the market potential (seize of demand) is. The bigger the number of suppliers the smaller is the optimal degree of individualization. The authors do not give an economic interpretation of these analytical results. For some parts the results are not plausible in comparison to the accepted consideration for the mass customization concept, where for example it is argued, that individualized goods causes benefits because of absorption of the price reserves. The demand's seize is irrelevant in connection with this aspect.

Some more hints relative to benefits of individual information goods we can get from the information retrieval sciences. From this discipline we know some performance measures (precision, recall, fallout). With the help of those we can say how well the retrieved information matches the intended information. Basically, individualized information goods are nothing else than a filter used for information retrieval. As a problem we can identify that we need to know the total seize of the data base. For this, the practical use of those measures is difficult. KASPAR therefore in his effectiveness comparison of two of the four identified individualization systems does not use the information retrieval performance measures, but he runs a user test in summer 2005 (Kaspar 2006, p. 155). He does a comparison of the

self selection (“MyUni”) and the observation based filtering (“myBestBets”). For this the first time the latter mechanism was implemented. It uses a session table with nearly 6 million entries produced within six weeks before the user test. The information good was the web presence of the University of Göttingen. The outcome of the test in a nutshell is shown below. As a conclusion we can say that in the case of MyBestBets the tool is the more useful the more confused the information need is (user type “browser”). In the case of MyUni the tool is the more useful the more content there is (user type “purchaser”).

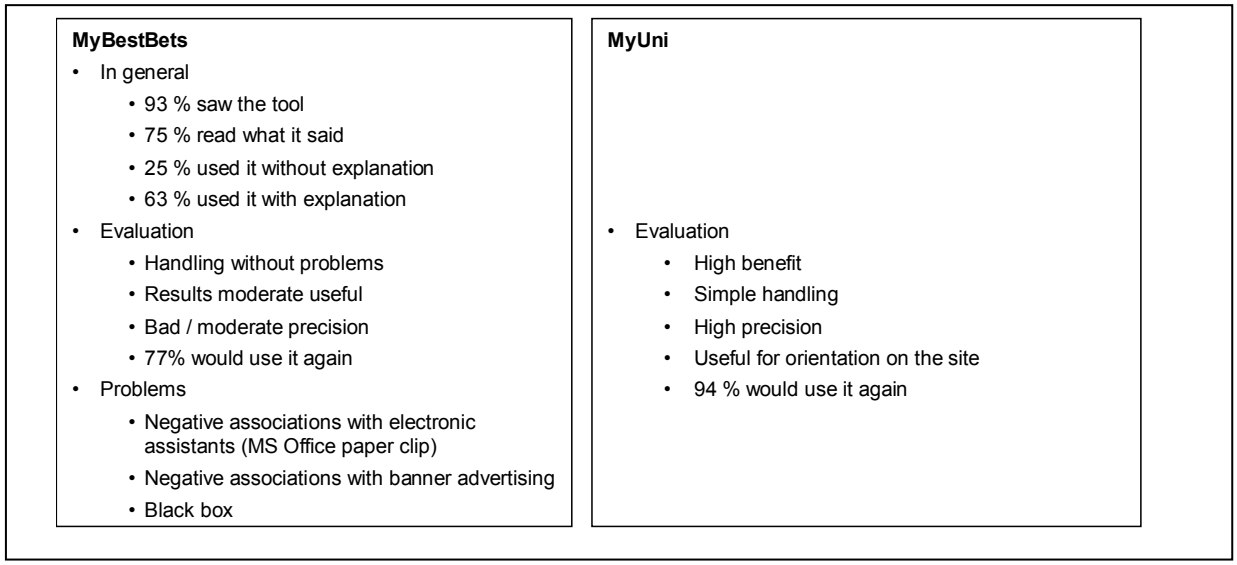

Figure 24: KASPAR’S effectiveness comparison of two individualization systems

From the point of view of the advertising customers information goods are useful as a carrier for advertising messages if they minimize losses due to scattershot approaches and if they cover the target group maximal (Schumann/Hess 2005, p. 30, see figure below).

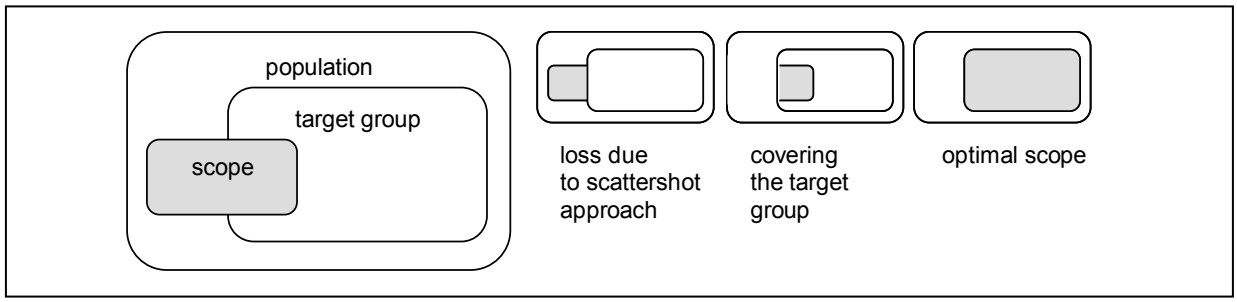

Figure 25: Scattershot approach, covering the target group and optimal scope

Individualized information goods can be useful for the aim of reducing the losses due to scattershot approaches because they better fit to the recipient’s preference as standardized products. The marketing research for this aspect uses the terms of *One-to-One-Marketing, Segment of One-Marketing* or *Target marketing* for a longer time. We can find an example of individualized advertising in the case of Google. Advertising messages which fit to the search request are shown dynamically there. Those concepts want to enhance the customer relationship management (for the changes in marketing see

Meffert 1994, Kotler 1989, Petrison/Blattberg/Wang 1993). The basic for these concepts is the fact, that companies usually earn the most of their money only with a few customers. Therefore advertising activities are useless which do not focus those important customers. Activities which focus at the important customers have advantages in the terms of cost, and effectiveness (Peppers/Rogers 1996, p. 32). Though, explicit analyses which deal with the field of effectiveness of advertising in individualized information goods exist nor in theory neither in practice.

4.2.1.3 Result evaluation

In the beginning it was argued that individualized information goods could increase the revenues. For this, the recipient needs to identify the use of those products, otherwise they will not spent money for this.

The analysis of the literature has shown that here are only a few works which examine the benefits of individualized goods. Only the simplified analysis of FINK resp. KASPAR allows a first conclusion for the basic conditions that are needed if individual information goods should have advantages. Scenarios are needed to identify which fulfill the conditions for advantage (selection of a large quantum of content). For example, a large quantum of content is built up by time. In the case of information products that supply the need for up-to-date information (newspapers, magazines) the quantum of content is qua definition smaller than in the case of those products which are less time-critical. For the latter music or professional information are examples.

As a facet we can say that - with the help of established theories - we cannot really identify the chance of increasing the revenues by individualizing information goods. The practice as well shows that individual information goods currently do not generate revenues. For example the Ciando idea is not accepted by the customers. For the individual version of the German Frankfurter Allgemeine Zeitung no fees are charged. The individualized German Handelsblatt (Topix) was rolled out a very extravagantly way. Meanwhile this offer was stopped.

4.2.2 Mobile information goods

4.2.2.1 Idea

Concerning to ICT the term mobility can mean different things (see Hess et al. 2005, p. 7 f.):

Mobility can mean that the devices are portable (e.g. Laptop, PDA, iPod). For this kind of mobility we can distinguish continuous mobility (in the case of wireless communication) and discrete mobility (in the case of wired communication).

The mobility of persons means that a user's identity can move from device to device, and from network to network. For this, a user profile is needed, that is independent from devices, providers, and networks.

The mobility of services means that the user can use his preferred services independent form device and locality. Again, a user profile is necessary.

A session is a temporarily relationship between distributed service components. A session is mobile if it can be interrupted and continued after that at another device or another network. For this, the status of the session needs to be saved.

In the field of business, mobile scenarios are called *mobile business*. Main characteristics are the use of mobile devices in connection with economic activities. This means the above mentioned mobility of devices is the relevant kind of mobility (Wirtz 2001, p. 44 f.). Mobile information can be used by the recipient with the help of a mobile device, for example a notebook, or a cell phone. This does not mean that the device must be wireless, but the latter is a part of mobile media use. Examples for mobile media are music (walkman, iPod), the cell phone soap opera Jong Zuid from Media Republic (Netherlands, Zibull/Riedel 2005, see figure below), Playboy Mobile from Tomorrow Focus AG (Germany, Kaspar/Wersch 2005), or the t-info directory service (Kaspar 2006, p. 192 ff.).

Figure 26: Mobile Soap Opera of Jong-Zuid

Another important term in the context of mobility is the specificity of locality (Kaspar 2006, p. 170 f.). From a technological point of view this means that a device must be located somehow if the user wants to use a mobile online service. From a sociological view a location is a specific social context in the term of roles and social rules. This specific context determines specific information needs (Giddens 1992, p. 185 f.). Moreover, we can distinguish different kinds of spatial mobility. First, there is the directed and the circular mobility (Forcher 1996, p. 15). Directed mobility means to change the location and to stay at the new location. Circular mobility means changing the location and going back to the start. This kind of mobility is used to manage the everyday life. Second, there is the original mobility and the secondary mobility. The first kind takes place for its own sake. The latter takes place in order to fulfill a specific need.

	directed mobility	**circular mobility**
original mobility	-	going for a walk
secondary mobility	driving to the holiday resort	going to the office and back home

Figure 27: Kinds of mobility

4.2.2.2 Benefit analysis

There is less knowledge about the user's acceptance of mobile information (Kaspar 2006, 207). Moreover, the discussions about this are much undifferentiated. For example, often it is not distinguished between online and offline mobile content. Using offline music at mobile devices is popular since the walkman appeared. Unlike this, the mobile reception of other content such as texts is not very successful to date.

KASPAR gives an overview of the state of the art in the field of mobile business acceptance research (Kaspar 2006, p. 202 ff.). He subsumes the existing papers to expert survey resp. Delphi studies on the one hand and customer survey at the other. In case of expert surveys we can identify a high degree of heterogeneity. Communication services like mail or SMS as well as entertainment services (music, videos, games), or information services like current news were supposed to be killer applications for the mobile business. As WOHLFAHRT criticizes, those surveys can be doubt because of methodological reasons like missing explanations about for example recruiting the experts (Wohlfahrt 2004, p. 47).

The aim of customer surveys is to find out about the (potential) customer's motives for or against using mobile technology (Kaspar 2006, p. 207). The Nokia survey of 1999 shows that users are interested in infotainment services like weather reports, or dictionaries and in transaction based services like doing banking operations or ordering pizza. In 2002, the Boston Consulting Group found out that customers suppose rational aspects like saving time when using current information to cause added value. Offers, which simply bridge niche times, are less important. Since 2000 A.T. Kearny holds a regularly survey of mobile phone customers. Result in 2003 was, that the mobile internet often is used for entertainment (games) and less for satisfying information needs or for doing transactions. KASPAR ET AL. hold a survey in 2005 together with the Association of German Magazine Publishers (Verband Deutscher Zeitschriftenverleger). Here the result is that mobile content above all is used because of curiosity. Moreover, if people use the mobile offers or not depends strongly on cost and of the quality of the offer as well as on the usability of the format. Moreover, the user's previous media routines are important. Especially recipients who have a very differentiate reading behavior in case of print media, are very positive minded against mobile content (Kaspar et al. 2006).

4.2.2.3 Evaluation of the results

Although there is some quantitative empiric there is only vague knowledge about the revenue potential of mobile content. Mainly it is not known how useful scenarios for mobile usage of content would look

like. Customers would only pay money for mobile offers if they can get an added value. This added value can emerge in the case that content can be apprehended in certain situation in general, like in the case of portable music while walking. Added value also can emerge in the case that the usage of content will be more effective (e.g. more contemporary) ore more efficient (e.g. less search).

As a facet we can say that currently there are now answers to the questions of the benefit of mobile content (Hankop/Wittke 2006).

4.2.3 Interactive information goods

4.2.3.1 Idea

The term interactive describes a reciprocal relationship between people who will have an influence on each other. Interactivity requires communication, either verbal or non-verbal, but interactivity is not the same as communication. This is because in the case of interactivity a person who get's a message reacts to that message referring to it (Rafaeli 1988, p. 119). Referring to information goods SCHRAPE defines interactivity as the user's general possibility to feed back to the offer (Schrape 1995, p. 28). As RAFFEE says, interactive TV is something being characterized by its two ore more sidedness of communication: the spectator gives a feedback which influences the show or the program (Raffée 1994, p. 23). A simple kind of interactive TV in this term is the possibility to call up to control activities, to vote or to help the participants of a quiz ("Who wants to be a Millionaire?"). More complex versions of interactive TV are those which allow the audience to control a narrative plot. First ideas in this term were born at the beginning of the 1990s. A thriller was broadcasted parallel by two German TV stations, each of which showed the story from different protagonists' perspectives (Beckert 2001, p. 49 f.). In this term, the audience's interactivity consists in switching the channels. In general, those technical complex projects were not more than prototypes (Beckert 2001, p. 51, Dahm/Rössler/Schenk 1998, p. 12). If we have a closer look at this ideas, we must say that information goods designed like this are nothing else than individualized information goods. An innovation in general can not be identified (similar Beckert 2001, p. 63).

Current ideas of interactive TV are trying to integrate different media in one device in the form of so called multi media home platforms (MHP). The "interactivity" ranges from the choice of added formats (e.g. background information of a TV report), via the possibility to stop the program at any point or to join the program via remote control, to the possibility to do transactions like ticket ordering. See the following figure of the MHP-program of Germany's TV stations ARD and ZDF.

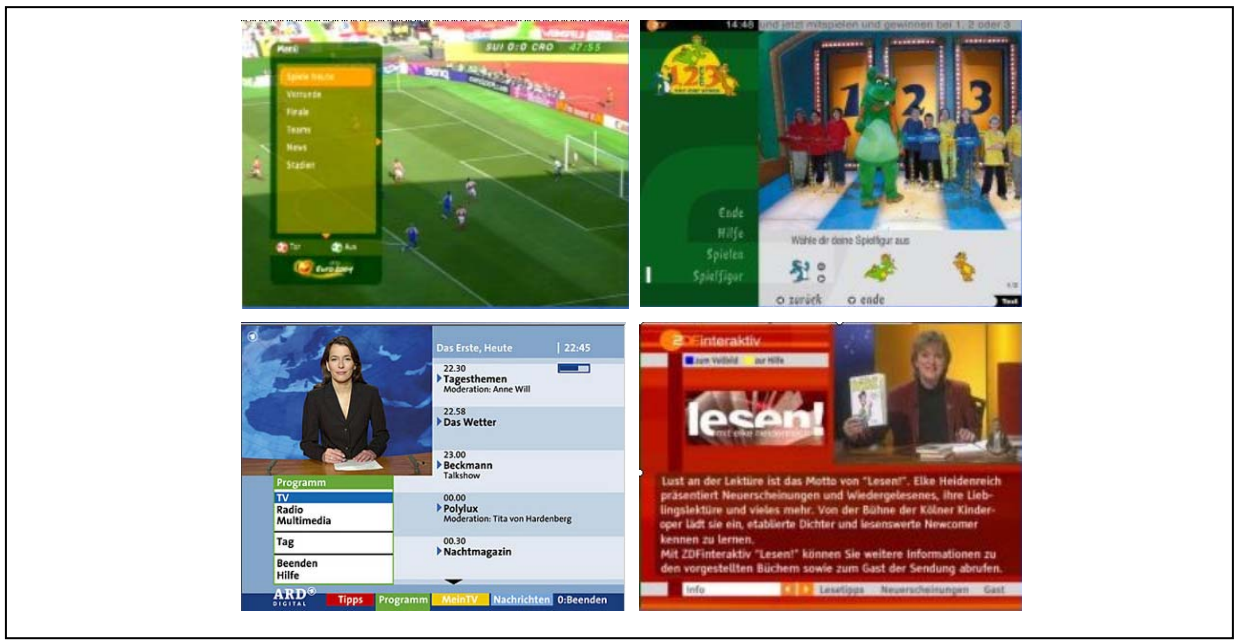

Figure 28: Screenshots from MHP-Offer of Germany's TV stations ARD and ZDF

The MHP-offers can be used by installing an extra hardware (set top box) or if the user has a TV with integrated receiver.

We know other interactive information goods since some years in the field of computer based trainings. Such software should react to the user's inputs. For example, it should suggest adequate ongoing learning paths or exercises subject to the learner's answers to questions. Either than in the case of the above mentioned TV program projects, the experience with this kind oft software were sobering.

4.2.3.2 Benefit analysis

In the field of interactive information goods scientific working-outs are seldom (similar Vorderer/Knobloch 1998, p. 166). One reason for this maybe is the fact that the early projects were all stopped because of technological difficulties and less fulfillment of expectations. Therefore maybe the topic is not present in the scientist's awareness. A few considerations we can find under the headword *reception research* in the areas of media and communication theory. There, essentially two aspects are interesting: On the one hand some researchers notice a "laziness hypothesis". They argue that for the audience especially consuming of TV programs should be as less active as possible, because it is leisure time enjoyment (Vorderer/Knobloch 1998, p. 164, Weidenmann 1989, ähnlich Schönbach 1994). Accordingly, using media actively by selecting and controlling the program and being exposed to a constant stream of TV program passively are two different things that do not fit (Hasebrink/Krotz 1996). Other arguments point out that within the last years a high activity of the audience in selecting and processing content can be identified. For this, the people are supposed to be interested in interactive products (Vorderer/Knobloch 1998, p. 164).

The newest activities in the field of interactive TV are very young. MHP is a comprehensive standard passed by the German TV stations ARD, ZDF, RTL and the former Kirch Group in 2001. Empirical data do not exist because of the small degree of diffusion. Theoretical works can be found neither in the

reception theory nor in the research field of innovation management. As ROGERS mentioned earlier, it is positive for the adoption of an innovation if the innovation is compatible to existing experiences or existing individual values (Rogers 1995). Referring to this, VORDERER/KNOBLOCH find out that especially those people who were socialized with new media are open-minded regards new electronic offers. Especially younger persons should have affinities to new electronic media offers (Vorderer/Knobloch 1998, p. 165). It needs to be proofed by empirical studies if those statements are correct in the case of the MHP.

4.2.3.3 Evaluation of the results

In the case of interactive TV as a possibility to control narrative plots as mentions above we can say that this actually is a kind of personalization. The recipient can choose between different standardized versions of an offer and he will take hat one, which fits best to his preferences. Moreover, we see that there are now offers of interactive TV in working order in the market. That is because of the high costs and we can assume that in the closer future there will no other tries of interactive TV.

In the case of MHP we can state that the research is still at the beginning. For this, we cannot make any statements about the potential.

4.3 Process innovations

4.3.1 Cross media publishing

4.3.1.1 Idea

In former times, media companies usually focused on single media for storage and delivery of the content (e.g. paper, record, broadcast, (Hass 2003, p. 54, see also again Figure 2, where the media market is structured referring to the media). The main reason for this is the high specificity in mastering the different media (Hass 2003, p. 54). Meanwhile we can identify a convergence of the previous separated segments because of possibilities to produce and deliver information goods without media discontinuities and because of the possibilities to store single pieces of content in modules and to store it media-neutral. This convergence allows to exploit resp. distribute content, once it is produced, via different channels resp. media (Hass 2003, p. 55, Pagel 2004, p. 300). This concept is called cross media publishing (Rawolle 2002, p. 93). See following figure (similar Hess 2004, p. 63).

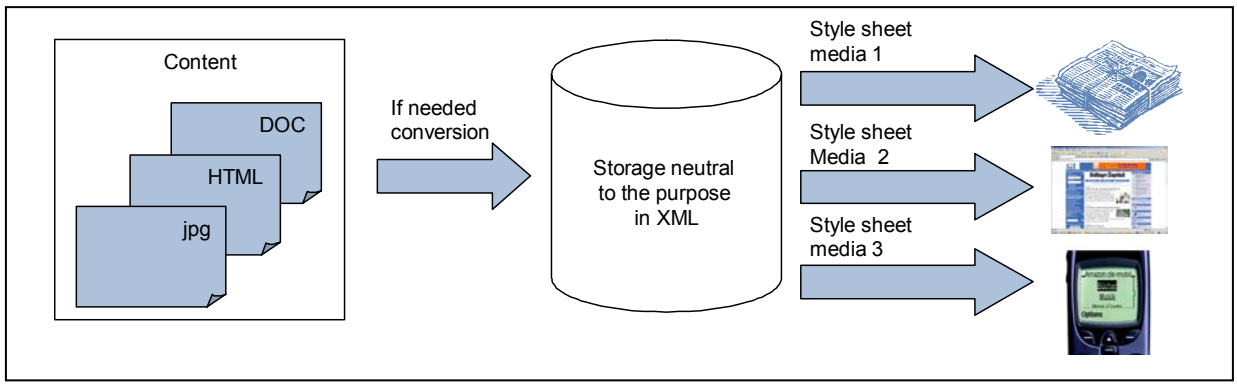

Figure 29: Cross media publishing

SCHULZE defines Cross media publishing as a variety of multiple usage of content (see Figure 30, similar to Schulze 2005, p. 65).

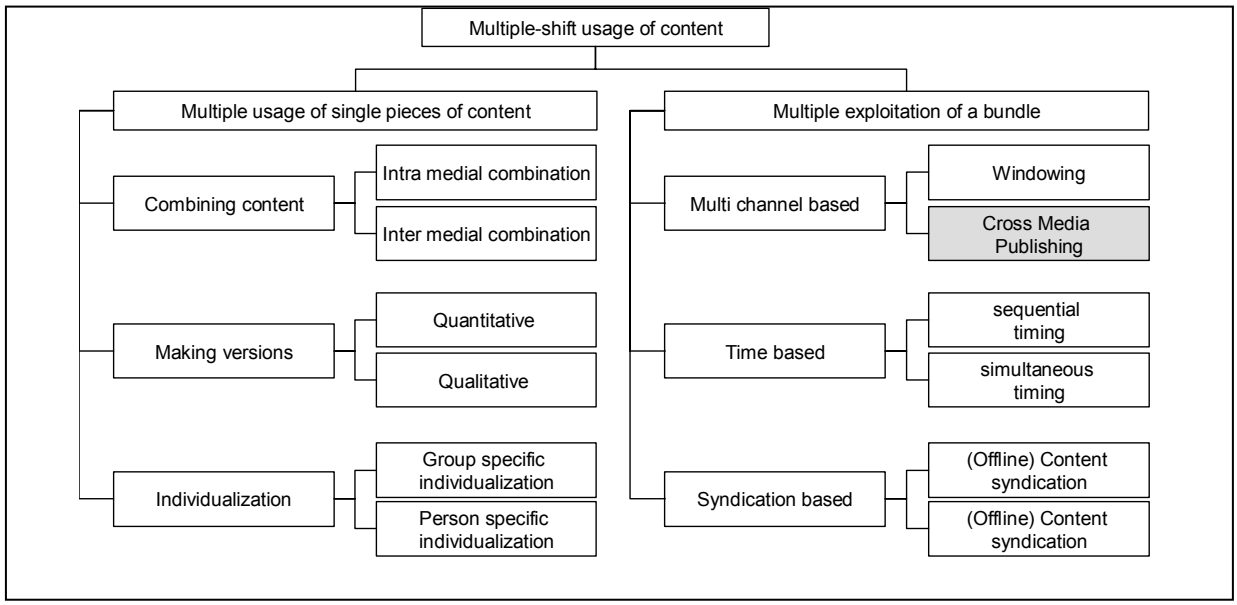

Figure 30: classification of cross media

It is the goal of cross media publishing strategies to maximize the revenue potential of a single piece of content or of a bundle by attracting further target groups with an optimal distribution channel (Hass 2003, p. 56). Because for this strategy it is not necessary to increase the number of input objects and the variable manufacturing costs do not arise (Schulze 2005, p. 169). For example, press publishers use this strategy to react to the absence of customers age 14-29 (Hess 2004, p. 61).

4.3.1.2 Benefit analysis

There are only a few theoretically or practically funded analyses which deal with the cross media publishing topic (analogue Schulze 2005, p. 88).

First hints can be found in media usage analyses. Those analyzes examine the media consume behavior of sections of the population. Those studies are useful, because cross media strategies only make sense, if the different channels do not cannibalize each other. This strategy is not effective, if existing customers only would substitute the media used up to now. RIEPL already did such an analysis

1913. In his paper *Nachrichtenwesen des Altertums* (*communications of antiquity*) he found that media once they are established never will be replaced completely and to last. Current analyses are done by the Arbeitsgemeinschaft Media-Analyse e.V. (Media Analyses Association). They explore the reading behavior of the 14 year and elder Germans since 1954. Since 1974 the German's media consume behavior is analyzed by the *Typologie der Wünsche* (*Desires Typology* of Hubert Burda Publishers House). Those studies are looking for substitution effects, income effects, time effects, as well as complementary effects in order to find out about relationships between usage of internet and usage of established media, such as newspaper, magazines, TV or radio. It is the main result of the analysis that the usage of new media touches the usage of established media only weakly (Hagen 2002). From this result we cannot infer a cannibalization effect.

More specialized are the results of KIEFER presented in her overview paper about the development of media usage (Kiefer 2003). She identifies the limited factors time and attention as critical for the fragmentation of the audience in case of arising numbers of offers. The consequence is decreasing numbers of user per media. For this reason it becomes more and more difficult for the media companies to cover the high fix costs by revenues from recipients or advertising customers (Kiefer 2003, p. 56). As well we can see that between 1997 and 2000 less online users have indicated that their TV consumes have slacked off because of the internet. The communication theory calls this an adoption effect. This means that new media loose their attraction after a first stimulus and established media become attractive again.

SCHULZE works out a concept for multiple media usage and does an evaluation with the help of seven case studies. He finds out that in general multiple used contents generate revenues, but those revenues do not have a significant impact on the total revenues of the media companies (Schulze 2005, p. 123). Though, the cross media concept is realized only by two of the seven cases. This fact limits the appropriability of the general findings to the cross media publishing strategy in particular.

WÜRTENBERGER and OETKER in their case study of the German brand BILD (a yellow press brand, www.bild.de) show that the cross media revenues do have a high impact on the total revenues of the company especially in case of advertising revenues (Würtenberger/Oetker 2003). The publishing house found out that almost 71 % of all BILD Online users do not read the BILD newspaper regularly, so there may be is a large potential to attract other than the users of the printed newspaper with another media.

RAWOLLE describes the usage of a content management system (CMS) at the German publishing house Heinrich Vogel. There it was the goal to make content accessible to the business customers via different media (CD and a print out in loose-leaf form, Rawolle 2002, p. 191 ff.). The customers of the print out in loss-leaf form *Transport Act* (driving schools), which is updated every quarter, said that this way of getting access to current paragraphs was too uncomfortable. This was the cause for implementing the CMS. With the system, the publishing house wanted to save parts of the market. Moreover, class of customers such as students or public authorities should be more attracted than to date. RAWOLLE'S case study does not tell anything about the fulfilling of the goals in sale. But it seems to be that the goals are reached essentially because the ICT investment in the CMS was amortized

within half a year and Heinrich Vogel meanwhile publishes some more print outs in loose-leaf form cross media.

4.3.1.3 Evaluation of the results

The given benefit analyses shows an inhomogeneous picture. On the one hand, some single case studies demonstrate the utility of cross media strategies from the companies' point of views. At the other hand quantitative studies show a very heterogeneous picture. Neither positive nor negative effects of the strategy in general can be concluded. KIEFER finds that there will appear a lot of challenges for research, which are to date probably not really recognized, because of the convergence of computer, TV and radio, the merge of mass communication and individual communication, the melting of professional and private communication, the phenomenal increase and differentiation of network-bounded and unbounded forms of communication (Kiefer 2003, p. 59).

As a facet we can state, that we cannot evaluate the effects of cross media publishing strategies in general at the moment.

4.3.2 Digital rights management

4.3.2.1 Idea

Digital Rights Management (DRM) is a concept of which the property rights of digital goods should be protected with the help of certain technologies. Copying and delivering digital goods shall be tied to the rules of the owner of the rights as in the case of physically goods (Grimm 2003, p. 97). Hess points out that it is the basic goal of DRM systems to prevent the uncontrolled pass and usage of content (Hess 2005b, p. 15). For this purpose, DRM systems could contain of our basic functionalities:

The *access control* guarantees that only those persons can use the content that have purchased it legally. To exclude users who are not allowed to use the content passwords or hardware authentication is required. Encryption methods shall prevent manipulation.

The *usage control* allows designing the rights in a very sophisticated way. Certain kinds of usage, such as printing, reading, copying or editing can be excluded (Grisebach 2005, p. 53). Those rights can be modelled with the help of right expression languages, like Open Digital Rights Language (ODRL, Seidenfaden/Hagenhoff 2004, p. 18.). In the devices, rule interpreter read the rights and execute them (Grimm 2005, p. 85).

Pursuing infringements shall make visible effected manipulations, such as forbidden passing of content. Therefore invisible or visible marks are plotted on the content or on the file (e.g. water marks). Those marks lead to an inseparable integration of meta data and information product.

Moreover, some DRM systems have functionalities to *clear the achievements* (e.g. download) that have taken place. In this case, an individual and differentiated invoice is possible (e.g. pay per use).

4.3.2.2 Benefit analysis

At present, DRM systems come up against two limiting factors. On the one hand, they are not really accepted by users of digital information products (Buxmann et al. 2005, p. 120, Walter/Hess 2003) and for this reason they are often bypassed (Grimm 2005, p. 89). Artists as well criticize the DRM. The music company Universal Music is going without the DRM system since 2004 in the case of its German artists because of customers who were annoyed about not working CDs. The company has decided not to use DRM until the technology is matured (Theurer 2004).

At the other hand technological standards (meta data format, protocols) are necessary to enforce the system widely. For this, international cooperation of creative, interest associations (e.g. societies for musical performing and mechanical reproduction rights), media accompanies, hard and software producers, and network providers is necessary. To date, such tries have failed (Grimm 2005, p. 86). Because of the users acceptance lack also a de facto standard cannot be established.

4.3.2.3 Evaluation of the results

The above discussion shows that the benefit analysis should have to perspectives.

From a *technological perspective* we can point out that the current concepts are not mature. Moreover, because of missing standards each system is incompatible to the others. Both aspects have negative impacts on the user's acceptance.

For the latter, statements about the *economic effects* cannot be given. Moreover, we have to ask if customers will accepts new usage and clearing models (e.g. renting a song instead of owning it), which in comparison to the well known models at least bring the feeling of disadvantages

4.3.3 Print on Demand

4.3.3.1 Idea

Print on Demand (PoD) describes a concept of which the print process is started after the consumer's order has arrived. Usually, printed material is produced for an anonymous mass market at the level of anticipated demand. This is done because of the high first copy costs and small numbers of copies are uneconomical. However, PoD allows printing batch size of one. In this case, two varieties are thinkable: First, the product can be printed as a standardized good. Each customer gets the same kind of the product, which however needs not to bee stored. Second, the product is customized. An example would be an individualized guidebook which only comprises themes the customer is interested in. From this perspective, PoD is a means to individualize information products.

Technologically it is necessary that the content is stored digitally, for example as PDF, or structured in a data base. Moreover, a printing process is needed which allows to print directly to the paper without having an intermediate media like a printing plate. Only under this condition the set up costs can be saved (Schumann/Tzouvaras 2003a, p. 235, for different printing processes see Fenton/Romano 1998). See the following figure for the PoD-process in case of a book (Tzouvaras 2003).

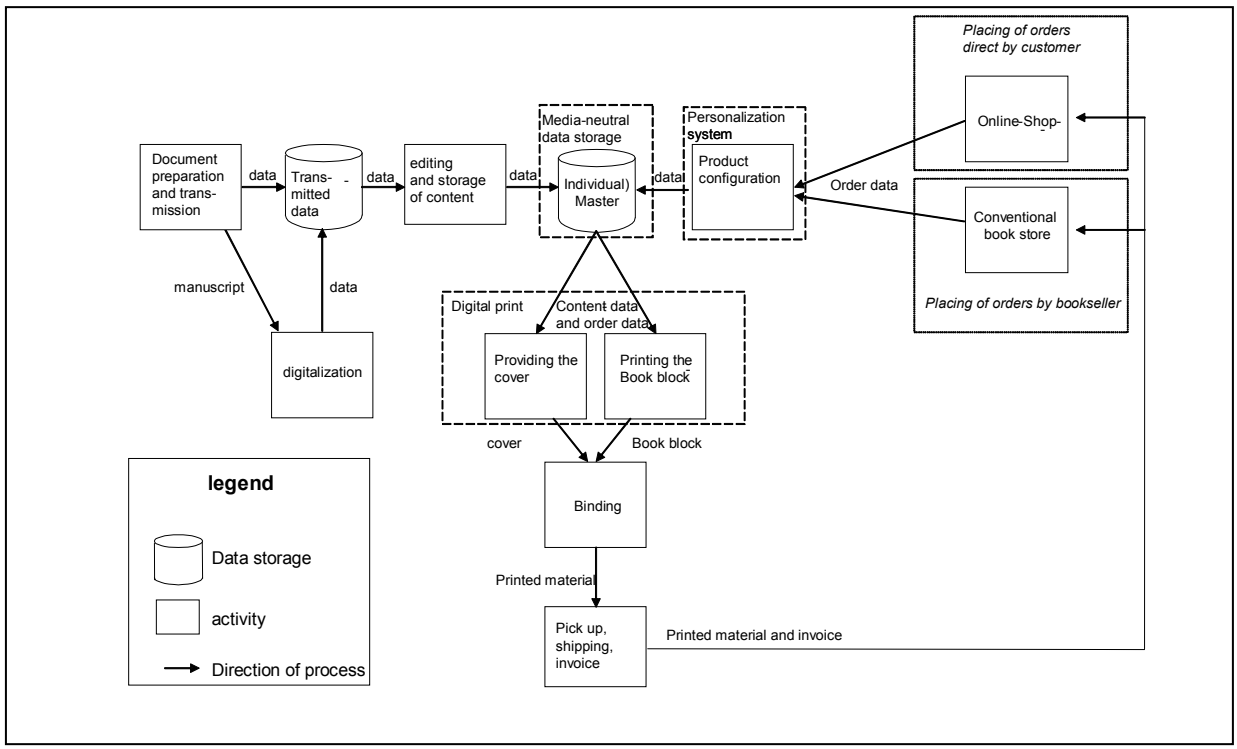

Figure 31: PoD process for a book

It is the aim of PoD strategies to make possible the printing of small numbers of copy, which is useful in the case of reprints or in the case of scholarly publications like PhD-thesises. Examples for an implemented PoD-process we can find at Libri GmbH (www.libri.de) and at Shaker Media GmbH (http://www.shaker-online.com, Tzouvaras 2003, p. 114 ff.).

4.3.3.2 Benefit analysis

A benefit analysis of PoD is given by TZOUVARAS based at the data of PLINKE (Tzouvaras 2003, p. 106 ff., Plinke 2001). The author carries out a cost comparison for conventional print and PoD as well as an analysis of the potential of PoD.

The costs are subsumed into production costs and warehousing costs. The production costs consists of set up costs (producing the print plate, set up the machine), which are fixed, and of variable manufacturing costs (use of paper and colour, attrition of machine). The set up costs in case of PoD are lower than in case of conventional printing. For this, the fix costs percentage of the total costs is smaller. The variable costs of PoD usually are higher because the PoD-process, especially in case of colour print is currently relative expensive in comparison to offset printing.

The warehousing costs consist of costs for storage and of order costs. Storage costs are capital lockup costs, depreciation costs because of content becoming obsolete as well as physical decay, shortfall costs because of too small numbers of copy, costs for disposing excess units, and costs for using the storage (write-off costs, rent, insurance, stuff, running costs). In the case of PoD those costs are smaller than in the case of conventional printing, because the physical storage of high quantities is not necessary. The order costs exist because of charge in and off the printed units and because of the physical handling of the printed material. Those costs again are smaller in case of PoD.

Moreover, there are ICT costs because of investments that are needed for the new printing process.

The following figure shows the different kinds of costs (analogue Tzouvaras 2003, p. 108, 1 = low, 2 = medium, 3 = high).

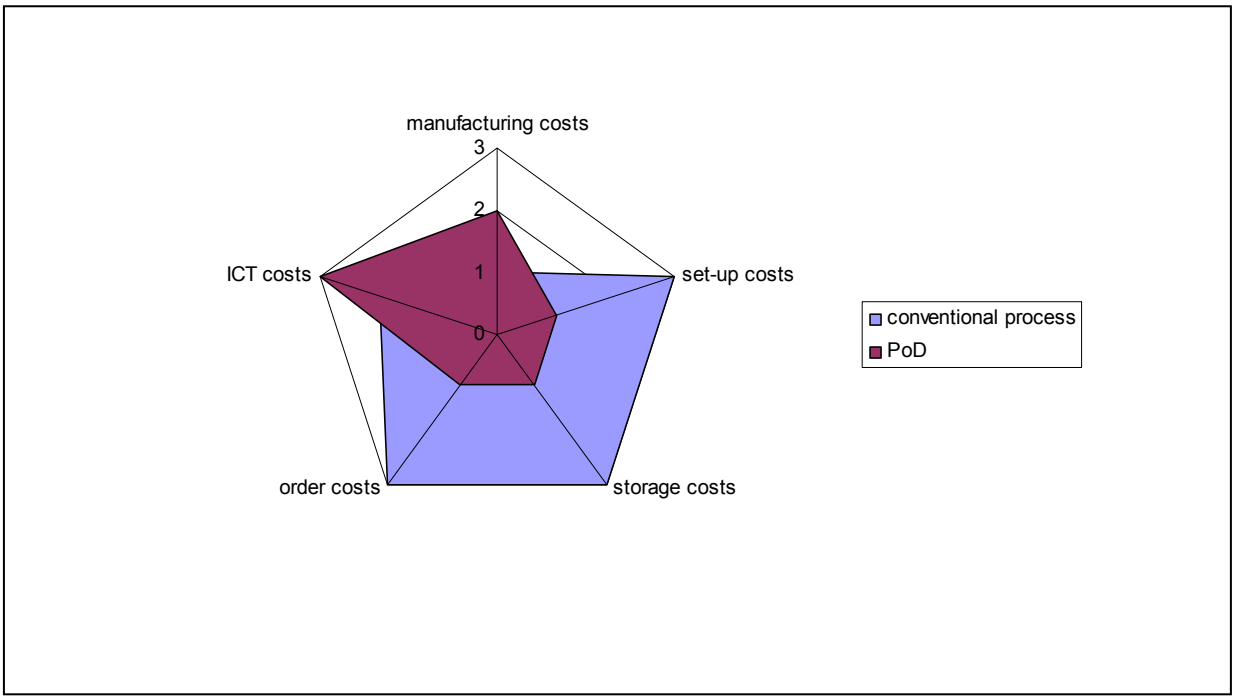

Figure 32: comparison of costs between PoD and conventional process

Because of the lower first copy costs and the higher variable costs the cost curve of PoD progress as shown in Figure 33 (Tzouvaras 2003, p. 108).

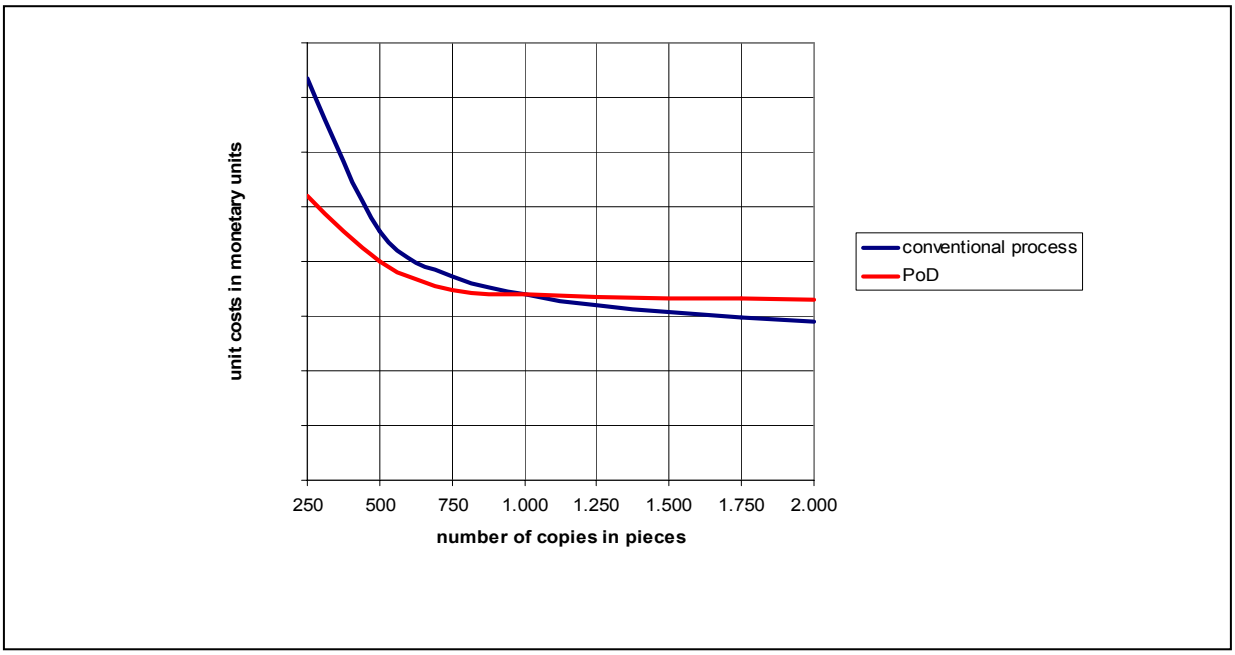

Figure 33: Unit costs of printing material in case of conventional printing and in case of PoD

Because of the cost situation it is he characteristic of the conventional printing process that large numbers of copies are needed. This implies first, that printed material has to be produced as standardized goods. Second, those materials have to be printed at one time and at one location. This fact leads to high warehousing costs because lacks of time and location between production and demand have to be bridged. With the help of these characteristics and the knowledge about the cost situation we now can identify the following potential value of PoD (see Figure 34, similar Tzouvaras 2003, p. 110):

The opposite of standardization is individualization. PoD allows to differentiate in terms of quality of the printed material (kind of cover, quality of paper, print layout), and in terms of bundling the content (Tzouvaras 2003, p. 113). Different qualities are carried out since longer times. This strategy is called *windowing*, which means that different windows of exploitation are used for absorbing the consumers' willingness to pay. For example, a book first is sold as a hardcover, after that as paperback. With the help of PoD the publisher can print different qualities at the same time. We have to ask if such a strategy really is helpful for absorbing the willingness to pay or if all customers would buy the cheapest version. This is not analyzed to date. Certainly, a useful realization of quality varieties depends substantially on the nature of the printing material. Only products of which the physical quality is not the main characteristic are considered to be printed in different qualities. About individualized products we talked in Chapter 4.2.1. In the case of PoD we can add, that individualization only is useful if content is not subject to such a tremendous decay by time that the products must be delivered weekly or even daily, which would let the costs for logistic arise. Second, the content must be usable in single modules which are not connected to each other regards content. Examples for such information goods are anthologies ore guidebooks with clearly separated categories.

PoD allows printing more flexible regards to time and location (Tzouvaras 2003, p. 111) which means smaller numbers of copy at one location or at one time. Through this, the following effects can be reached: Printing at different locations lead to lower logistic costs. The product can be delivered to the customer faster or cheaper. Printing at a different time means to have an on demand production. This is interesting if the demand can only be anticipated weakly and will appear not regularly (e.g. Phd-thesis, reprints) or in case the content needs an update frequently (e.g. texts of a law, Tzouvaras 2003, p. 112).

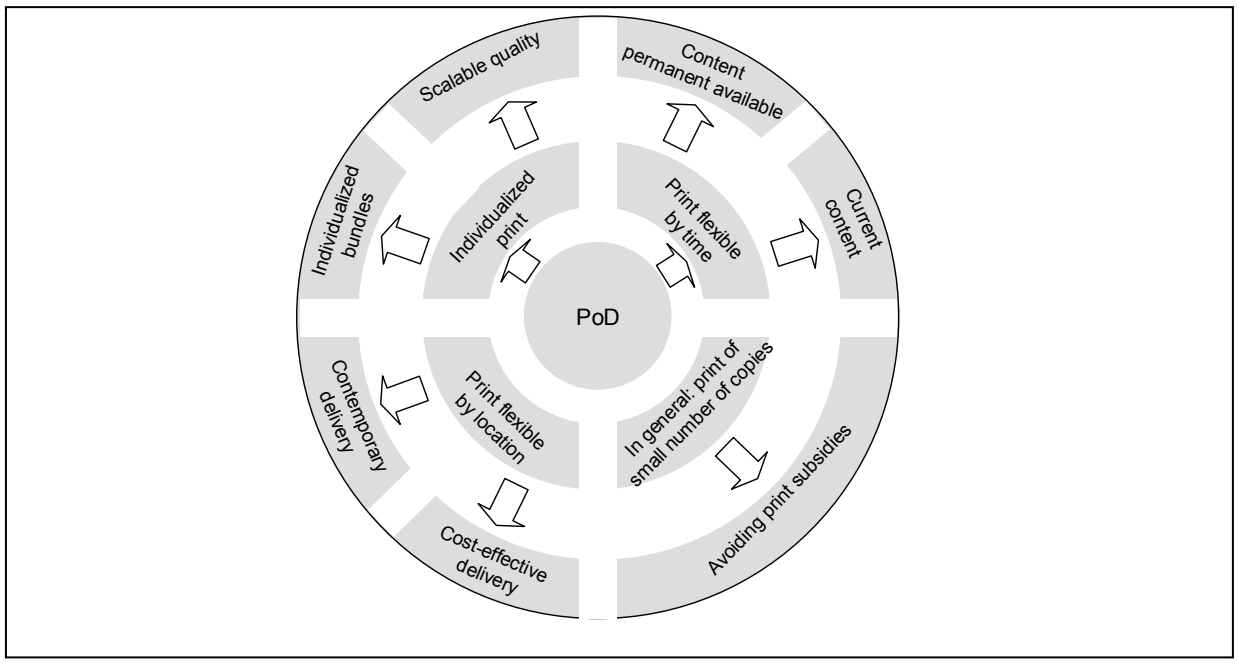

Figure 34: Potential of PoD

4.3.3.3 Evaluation of the results

The PoD phenomenon is explored very well. But we know that only very specific constellations will generate a benefit. These are:

- Content become obsolete very quickly (e.g. texts of law)
- Delivery is time-critical for the customer (in case of professional demand more than in case of private)
- Delivery is cost-critical for the customer (in case of private demand more than in case of professional)
- Content is usable as single units (papers in anthologies)
- Physical quality is not important
- Weak possibility to anticipate the demand
- Irregular demand

For the PoD-suitability of different printing material see the following table (information goods at the right part are more suitable than at the left).

criteria	high, good, not possible, not important, small		low, bad, possible, important, big	
Importance of physical quality (high/less)	coffee-table books, art print	magazines, guidebooks, encyclopaedias, textbooks and reference books if colour print		newspaper, fiction, textbooks and reference books
Possibility to anticipate the demand (good/bad)	newspaper, magazines	textbooks		scholarly reference books, reprints
Possibility to separate the content (not possible/not possible)	textbooks, monographs	guidebooks, encyclopedias	anthologies, newspaper, magazines	
Level of delivery costs (not important/important)	reference books	Scholarly reference books, newspaper, magazines		textbooks, fiction
Delivery time (not important/important)	fiction		reference books, textbooks, newspaper, magazines	
Necessity of update (low/high)	fiction, coffee-table books, art print	reference books and textbooks (stable content), guidebook	Reference books and textbooks (dynamic content)	encyclopedias, text of law, magazines, newspapers
General demand potential (high/low)	newspaper, magazines, fiction	guidebooks, coffee-table books, art print, encyclopedias, fiction		reference books, textbooks

Figure 35: suitability of different printing materials for PoD

4.3.4 Recipient as producer (procipient)

4.3.4.1 Idea

The first idea of consumers taking over parts of producing comes from TOFFLER (Toffler 1980). He has formed the artificial word of the prosumer, which is a merge of producer and consumer. While TOFFLER originally has focussed at the establishment of customers activities in manufacturing household goods (repairing) the term has extended in literature. Nowadays it contains every value added activity which substitutes or complements marketable services (Michel 2000, p. 73, Mildner 2004, p. 125). In the case of substitution consumers are taking over activities which before were done by professionals. An example for customer oriented services as a simple way of prosuming is the self service booking of a flight ticket. In more complex cases the consumer takes over the producing of a good, such as open source software. Prosumer, who acts complementarily, generate solutions in addition to existing goods. This point of view can be compared to the lead user concept of VON HIPPEL (Hippel 1986). As HANEKOP/TASCH/WITTKE say the modern prosumer in comparison to that one of TOFFLER does not

longer need to have manual competences, but intellectual capabilities such as knowing how to handle ICT (Hanekop/Tasch/Wittke 2001, p. 90).

In the following the term procipient is used because only prosumer concepts in the case of recipients do make sense but not in the case of advertising customers.

4.3.4.2 Benefit analysis

In the beginning of this paper the concept of procipients was characterized as a possibility to change market structures. From the media companies point of view this only makes sense if there are impacts on revenues or costs. The procipient concept must satisfy this condition in general.

The value structure of the media industry consists of three steps: producing the content, bundling the content, distributing the information good (see again Figure 1). Procipients can be active at each of the three steps.

An example for procipients at step one can be found in the music industry. The technological production and the financing of titles nowadays can be done private technologically and financially (Mildner 2004, p. 124). MILDNER mentions the example of the band Marillion, which gets a pre-finance of their labels from its fans and needs neither the producer's technological know-how nor its financial capabilities. Another example is the case of the Wikipedia encyclopedia, of which production either does not need the technological, financial and editorial capabilities of any publisher. In both cases, we must consider that those activities do not have any positive impact on the media companies' value adding, because the value adding is completely done without them. Though, MILDNER identifies potential in her comparison of the music industry with the open source software development (Mildner 2004). She points out that open source business models mainly consist of bundling diverse open source software at storage media like CDs and distributing those together with additional services like consulting or manuals. Transferred to the music industry this concept would mean to bundle the titles of label independent artist and to add value generating services like a band guide. Moreover, companies could offer internet platforms, which allow the artist to upload their songs themselves. Examples for this are www.uptrax.de, www.mp3.de or www.besonic.de. Those portals get money from advertising customers or take some upload or download fees. So, a media companie's potential consists of collecting content from different sources (different independent artists, photographers or authors). But here the question arises if collecting different content is really an inimitable capability and if this could not be done by other players (e.g. by telecommunication companies). At this point, we have to refer to the discussion about the nature of information products regarding possibilities for quality inspections. Information goods are experience goods, of which the customer can control quality at the product's surrogates, such as the established name, preview possibilities or reviews (Schumann/Tzouvaras 2003b). So it must be checked from on case to the next if the media companies name is critical for the success of such a bundling strategy. Successful content portals such as T-online show that the bundling capabilities are not an inimitable specific of media industries qua definition (see for the T-Online case Holtrop 2003).

At the bundling step we can find procipients if the consumer himself selects the wanted content. The outcomes of this procedure again are personalized information goods. The media company's achievement shifts to offering a matching mechanism (see architecture of an individualization system), what changes the company's activities at this value step. At this point we can see very clearly that the consumer only would overtake the media companies' original to dos if his needs are fulfilled in a better way or if this would make the product cheaper for him. Maybe, further hints for the benefit discussion of individualized information goods can be found at the literature about the self serving and the prosumer concept.

An example for the distribution step is the P2P file sharing system. Recipients of digital information goods become supplier of those. It is necessary to identify approaches how a media company can reap the benefits of those phenomena. The piracy discussion has shown that those activities do more harm than good to date. One approach is given by GEHRKE. He outlines a business model for a legal file sharing system. Hi discussion shows that basically there are three ways to fight against illegal downloads in order to prevent the properties of rights (Gehrke 2004, p. 125). First, *technological barriers* can be implemented. Those prevent illegal usage of digital files ex ante. The already mentioned BUXMANN study shows that the recipient's tolerance against technological barriers is very small (see p. 13). Second, infringing of copyrights is punished ex post by *legal sanctions*. Those means can be understood a disincentives. The discussion about risk collectivization and the possibilities to exhaust P2P systems without a central server has shown the ineffectiveness of such measures. An innovative possibility is to build up *economic incentives*, which should tempt the user to behave legal to the copyright. GEHRKE designs a model like this, which is shown in the figure below (Gehrke 2004, p. 128). The basic idea was developed by the Fraunhofer Institut IDMT and the 4FriendsOnly.com Internet Technologies AG with the potato system (Grimm 2005, p. 92 and www.potatosystem.de).

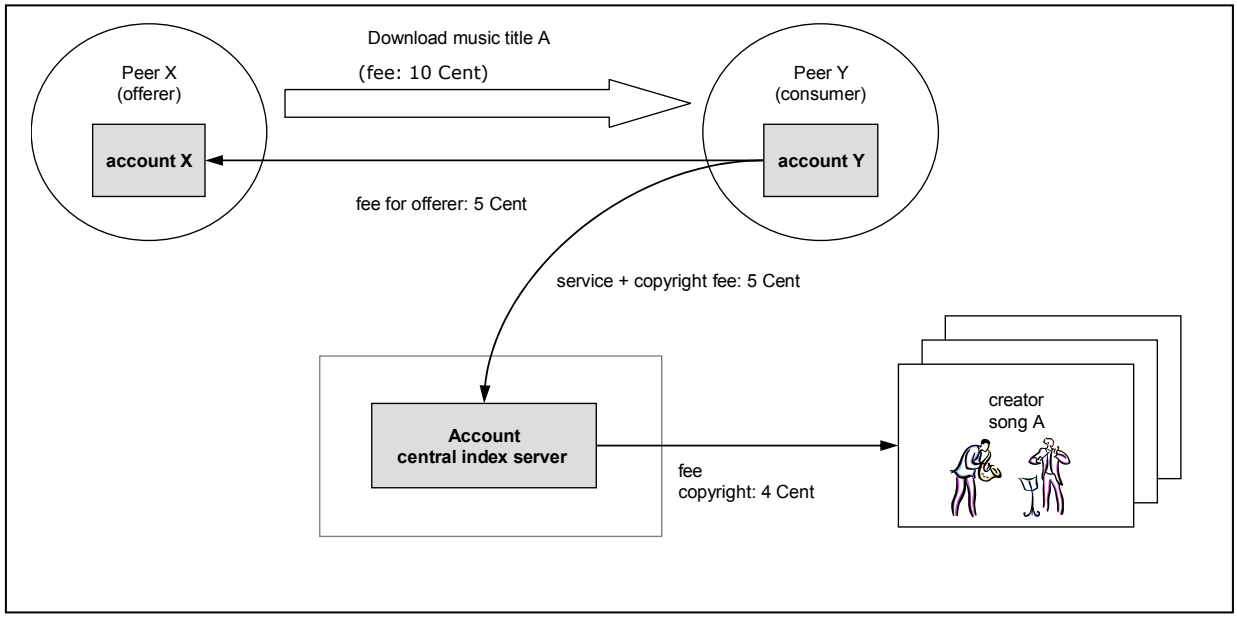

Figure 36: Distribution and revenue model

In this as well as in the potato system the recipient of a song can act as a supplier of the song himself and earn money with that service: Peer X supplies a song for download. Consumer Y downloads the song after finding it with the help of a central index server. Y pays a fee, which is accounted proportionally to the accounts of X and the index server. The index server provider pays the creator of the song.

GEHRKE analyzes his model technologically as well as economically. From the technological perspective it has to be guaranteed that no misuse takes place. This means, both the song itself and a good quality as well must be delivered. And, all required payments must be effected. The author designed a decentralized architecture with encryption mechanisms (Gehrke 2004, p. 136 ff.).

From the economic perspective it is necessary to examine the incentive structures of the model. We need to ask why and under which circumstances a fee based model should prevail against a (illegal) system for free. The condition for participation can be formulated as follows (Gehrke 2004, p. 148 ff.):

$$\alpha m p - p + u \geq u \Leftrightarrow \alpha m \geq 1$$

The user of a feeless system has the use of the downloaded song itself (u). This use also arises in the case of the chargeable system. Moreover, in the chargeable system the user has to pay the fee for the download, which increases his use (-p). Additional use arises because of the refunding the user itself earns when supplying the song he has downloaded. This refunding consist of the number of downloads of the song (m) and the provision per each download (α). The total use of the chargeable system needs to be at least equal to the usage of the feeless system; otherwise the chargeable system would not have any participant. As the equation shows, the quantity of expected downloads (m) as well as the level of the provision (α) is critical. The former depend on how many other peers do supply the file for downloading. The more suppliers, the less is the proportion of consumers who download from a single supplier (given equitation of the demand). Critical for the favourability therefore is the time a peer enters the system as a supplier so that he can reach a certain level of profit (k)[3]. In case of knowing the critical time, the percentage of participants can be determined, which have a definite level of profit. The following figure shows how many participants just do not have any loss (k=1). We can see, that maximal 35 % of all participants benefit on condition that the provision α is 100 %. This would mean the provider of the index server as well as the creators would not earn anything.

[3] With a level of profit of k= 1 the participant would not have both, profit or loss.

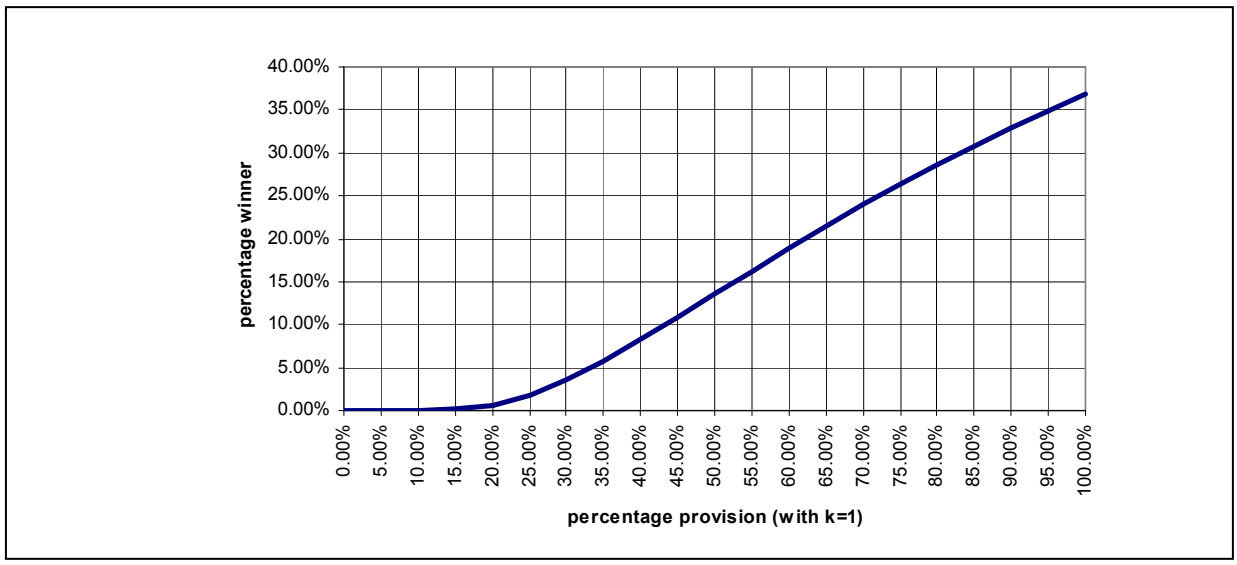

Figure 37: Maximal percentage of winner (k = 1)

The critical size of the provision α can be determined with the help of the percentage β of the suppliers in feeless systems, because chargeable systems would only work if it succeeds to take away the suppliers of songs from the feeless systems. The figure below shows the critical level for the provision α subject to β. For a percentage of suppliers of 10 % a provision of 43 % would bee needed to encourage those suppliers to switch the system.

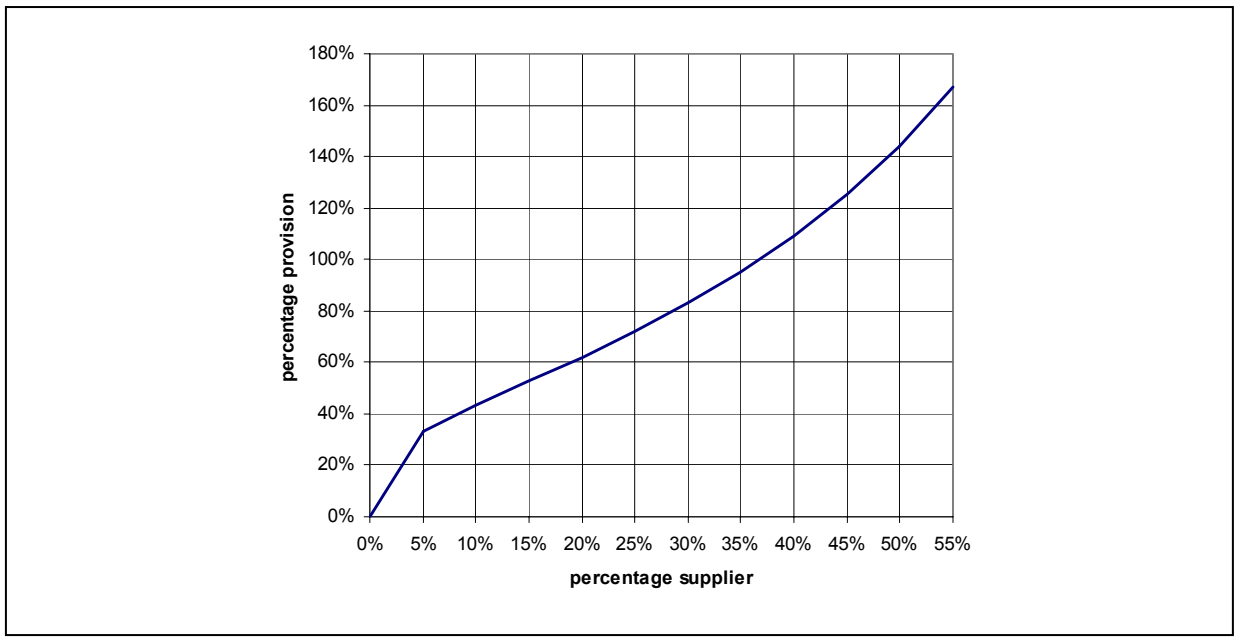

Figure 38: Percentage provision depending on percentage of suppliers of the feeless system

The discussed model has influence on the diffusion of a song. Now, a title is not only demanded because of its own original use, but also because of the possibility to earn money with its distribution. An attractive and therefore highly demanded title will have additional demand within the system because of its high revenue potential. Such a song will have a quicker diffusion than it will have in the

feeless system. In analogy the diffusion of a less attractive song will be hampered. For the different diffusion curves see the figure below (Gehrke 2004, p. 160).

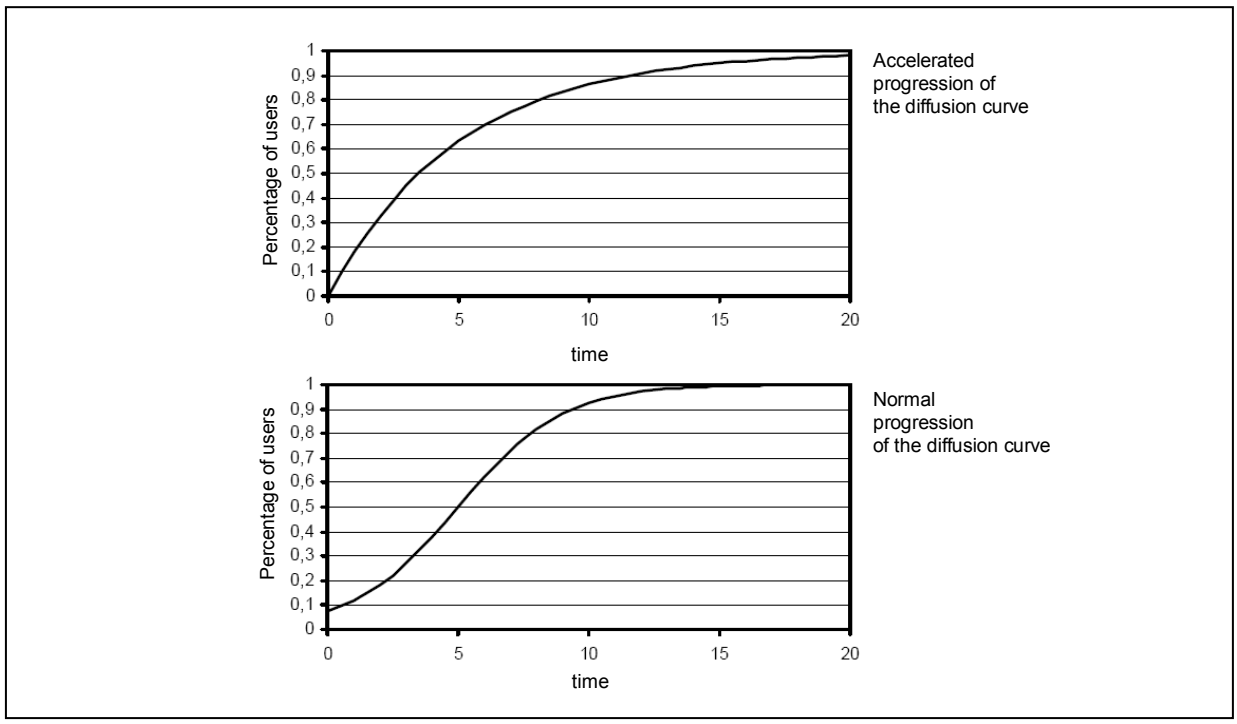

Figure 39: Progression of the diffusion curve within the chargeable (above) and the feeless (down) system

4.3.4.3 Evaluation of the results

The above discussion shows that the potential of the concept of the procipient is suspected not to be very high. At the creating stage the procipients activities lead to a loss of value adding activities which is not replaceable. So, this again is more the cause of the discussed problems than a solution.

In the case of the bundling stage it became transparent that the potential of individualized goods needs to be analyzed deeper. Beyond the well known literature about individualization the literature about self services and the concept of the prosumer could give more information about the benefits.

A theoretical funded benefit analysis of the potential of the concept of the procipients only is given by GEHRKE for the distribution stage. He himself criticizes his model by asking if the users of feeless systems in fact would switch the system because of economic incentives (Gehrke 2004, p. 161). So, it is necessary to analyze the motivation of those participants of the feeless system. A game theory analysis of the economic calculation of the song supplier is given by BECKER/CLEMENT. However, the analysis only can explain that offering a song is not irrational, what could be assumed because of the high costs of the first supplier (value adding costs of digitalization, risk of being caught, storage costs, and online costs, Becker/Clement 2003). The sustainability of the GEHRKE model needs to be tested by expiry (survey, implementing prototypes). A first clue is given by the study of TREPTE ET AL about the motives of sharing MP3 files instead of buying a CD (Trepte et al. 2004). Moreover it is necessary to think about if it could succeed that the songs suppliers of *all* illegal systems will switch – given the operating ability of the GEHRKE model in general. This point becomes more transparent if we have a

closer look at the β parameter. This parameter is different in all feeless systems, so that the question arises how to aggregate all that different measures. From a theoretical perspective it seems to be that only a comparison between exactly two systems can be managed.

4.3.5 Open Access

4.3.5.1 Idea

According to the 2003 Berlin Declaration open access to scholarly information means: "The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship […], as well as the right to make small numbers of printed copies for their personal use" (Bullinger et al. 2003). The demand for *free* access implies, that scholarly information is accessible free of any charge for recipients and institutional demand (libraries). It is the aim of this kind of publications, to have a diffusion of knowledge which is faster and free of any friction for wider masses of recipients (Müller-Lietzkow 2004, p. 195).

To achieve open access to scholarly journal literature, the Budapest Open Archive initiative (BOAI) recommends two complementary strategies (w.a. 2006b):

1. *Green Road (self-archiving):* Scholars archive their papers at their own servers or at institutional repositories. Publishing houses sometimes allow this kind of second publishing parallel to the regular publishing a journal (Seidenfaden/Ortelbach/Hagenhoff 2006). Institutional repositories are financed by membership subscriptions.
2. *Golden Road (*Open-access journals): as in the case of classical journals, papers are reviewed before they will be published online. This way is financed by reversing the money flow: authors have to pay a publishing fee. An example of this is the Springer open choice model (Seidenfaden/Ortelbach/Hagenhoff 2006, Chapt. 5.3).

As a critical point of open access we can identify the durable and reliable archiving of electronic publications (similar Bargheer 2006, p. 170). This is relevant from an organisational perspective as well as it is from a technological perspective. From an organisational perspective it is necessary to define responsibilities not only for archiving single pieces of paper, but also for archiving complete volumes of a journal. From a technological perspective the long time archiving of electronic documents in different formats (PDF, html, etc.) and of the surroundings (operation system, protocols) as well is a big challenge.

4.3.5.2 Benefit analysis

We can analyze the benefit potential from three perspectives:

First, we can examine which stimulus there is for a publishing house to establish an OA business model. The Golden Road approach would change the established power structure between publishers and authors because the latter would became customers who pay for services.

Second, from the author's perspective we can examine the motivation of publishing in a chargeable system instead of publishing in a system which is for free. The Golden Road approach shifts the costs from the recipients to the producers of content and knowledge. For this reason we have to find out why an author should change the system.

Third, we can do the analyses from an over-all total perspective. This could touch on social aspects. For example, it is necessary to find out if the students and researchers supply with literature would work better in the case of OA in comparison to the established way. The Golden Road approach for example will cause external effects because the authors have to pay for publishing the knowledge while the use in terms of having access to that knowledge appears completely at the site of the demand. The over-all perspective also could touch the complete value structure of the scholarly communication. Here we would have to ask in general why (and not how) scholarly communication takes place and which players do have which role within the value structure. Papers dealing with this view can be classified as structuring papers.

McCABE and SNYDER give a microeconomic analysis of OA journals (McCabe/ Snyder 2004). They model a so called two sided market which is characterized by the fact that publishing fees do exist as well as subscription fees. The authors try to find answers to the following questions:

1. Would a profit-maximizing journal ever voluntarily choose to have open access?
2. Could a non-profit journal with the objective of introducing open access be competitively viable?
3. Is social welfare enhanced by open access?

Regarding to the first question the authors find out that "a profit-maximizing journal would be more likely to adopt open access in equilibrium a commercial publisher the lower the journal's market power, the lower the marginal costs of serving a reader and the higher the distribution of author benefits" (McCabe/Snyder 2004, p. 28 f.). Concerning question two they found out that beside the already mentioned aspects the company would also be more likely to be competitively viable the greater its market power is. The findings in case of question number three are that OA tended to be inefficient when readers' benefits were large relative to authors or when the marginal cost of serving readers was high.

ROOSENDAAL ET AL in their work present a framework which is suitable to analyse the effects of ICT based innovations to the value chain of the scholarly communication (Roosendaal/Geurts/van deer Vet 2001). For this, they first describe the market and its forces. The forces are:

- actors: authors and readers
- content: questions and answers
- accessibility: availability and retrievability
- applicability: science and technology

The latter force is only described marginal and therefore it needs further explanation. The analysis drives the authors to the findings that the market of scholarly communication is characterized by multi dimensional feedbacks. Researchers as well as students desire a unified collection of research results. "This collection is then distributed over many subdivisions, and results in a number of organisational conditions" (Roosendaal/Geurts/van deer Vet 2001, p. 30).

In a next step the functions of scholarly communication are analyzed. There are four functions which are established in literature (Roosendaal et al. 2003 or Seidenfaden/Ortelbach/Hagenhoff 2005, p. 8):

- *Registration*: this function is used to realize the author's property rights. An idea only can be assigned to a scholar if the scholar publishes it. Moreover, the registration is a very important part in the reputation system, which is the currency system of the science (Hanekop/Wittke 2006, p. 210).
- *Certification:* the certification also is a component of the reputation system. Papers are reviewed by peers and with this their quality is checked.
- *Awareness:* the awareness of an idea allows other researchers to use the idea as an input for their own work. Relevant findings only can be found if they are codified in an adequate way.
- *Archiving:* this function is used to serve the knowledge. It is necessary to keep the knowledge for the posterity.

With the help of this functions ROOSENDAAL ET AL. examine the changes which appear because of the usage of ICT within the system of scholarly publishing. The authors point out, that in case of conventional publishing the focus lies on the functions *registration* and *archiving*. However, further developments need basically to rethink the *certification*.

SEIDENFADEN/ORTELBACH/HAGENHOFF have carried out a typology of new kinds of scholarly communication with the help of case studies (Seidenfaden/Ortelbach/Hagenhoff 2006). The work gives a structured description of the current reality. It was the aim to give a systematisation of single activities (see following figure).

case	**function**			
	registration	**certification**	**awareness**	**archiving**
PLoS	+	+	+	+
BMC Journale	+	+	+	+
BMC Faculty of 1000	/	+	+	/
Open Choice	+	+	+	+
arXiv	+	/	+	+
RePEC	+	/	+	(+)
eDoc	(+)	/	+	+
OAIster	/	/	+	/
Google Scholar	/	/	+	/
Scopus	/	/	+	/
JSTOR	/	/	+	+
Legend	*+ fulfilled* */ not fulfilled* *(+) partially fulfilled*			

Figure 40: classification of case studies

The OA phenomenon shows parallels to the file sharing topic. Music producers as well as scholarly publishers do not have any interests in distributing their content for free via the internet, because this would let erode their business model completely. The incentive based P2P model of GEHRKE faces the challenge to shift the users form one system to another. The same challenge appears in the case of the Golden Road approach. In analogy to GEHRKE we can model he participation condition in the case of the Golden Road approach as follows:

$$-p + u \geq u \Leftrightarrow -p \geq 0$$

U is he use the author gets in case of publishing an article. This use appears in general in the case of publishing conventionally (CP) as well as in the case of having an OA publication. Parameter p is the fee the author has to pay for the publication, which reduces the authors use. We can see immediately, that the OA publication in general can be beneficial only if the use in both cases would be different. For this, we have to differentiate the use concerning to publishing motives which leads to the following participation condition:

$$-p + u_{c}^{OA} + u_{Dif}^{OA} + u_{Im}^{OA} \geq u_{C}^{CP} + u_{Dif}^{CP} + u_{Im}^{CP}$$

$$\Leftrightarrow \quad -p \geq (u_c^{CP} + u_{Dif}^{CP} + u_{Im}^{CP}) - (u_C^{OA} + u_{Dif}^{OA} + u_{Im}^{OA})$$

The publication motives can be deduced from the above mentioned functions:

- The function *registration* leads to the publishing motive of claiming research results to the author (c)
- The awareness function leads to the motive of knowledge diffusion (dif) with the purpose of supplying input for other researchers.
- The archiving function also is good for this purpose.
- A researcher gets reputation if his articles are published after passing a review process. Regardless other scientist actually read the article or not, reputation arises by publishing in a prestigious journal (impact, Im)

The use reducing parameter –p only can be neutralized if the difference between the use of the conventional system and the OA system is negative. This is the case if at least one publishing motive ceteris paribus is better fulfilled in the OA system than it is in the classic system and because of this the u^{CP} gets a higher measure than the corresponding u^{OA}. We can presume, that both the motives claiming research results to the author as well as diffusion are be fulfilled better in the OA system, because the free access to the content has qua definition positive affects on the diffusion, and in case of advanced diffusion the claiming can be enforced better. Do those motives ceteris paribus have a high priority to the author; he will take the OA system.

The following table sums up the cited works.

	Analyses from the perspective of the publishing house	Analyses from the perspective of the author	Analyses from the over-all perspective
McCabe/Snyder	X		X
Roosendaal et al.			X
Seidenfaden/Ortelbach/ Hagenhoff			X
Gehrke analogue		X	

Figure 41: Classification of the cited work

4.3.5.3 Evaluation of the results

Currently, the Open Access topic is discussed very emotionally both by the publishing houses (of which find their business model threatened in general), and the institutional demand (of which especially argument against the commercialization of scholarly information) as well. The concerned scholars their self in many disciplines give the impression of not being touched by all this.

The analysis of the literature shows that there are only less well funded examinations of the potentials, challenges and effects of OA models which go beyond just listing suspected effects. The above mentioned works are first approaches which can be a basis for further research.

5 Final statement

Figure 42 again shows the presented classification of the ICT based innovations as possibilities to face the challenges. Now, we have to evaluate if these possibilities fulfil the presumed potential or if they do not.

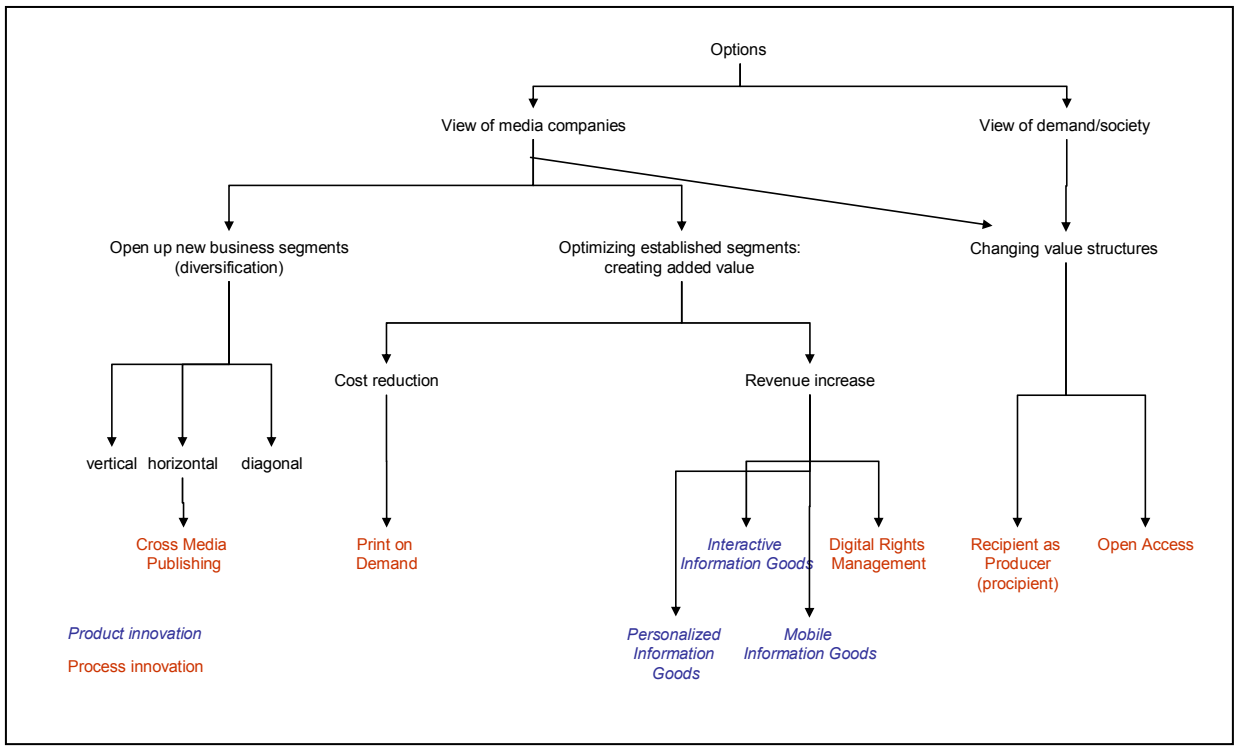

Figure 42: Systematic of the ICT based innovations

Concerning to the potential of *cross media publishing* strategies we are not able to give clear statements. In practice, cross media delivered content (e.g. online newspaper parallel to paper based newspaper) seems to be more a cost causing naturalness than an option for generating new revenues. Single cases (Heinrich Vogel) have shown that the differentiation of delivery channels was absolutely necessary to strengthen the strategic proposition, and moreover customers have required this. But it is not transparent if added value could be generated or if the strategy was only useful to prevent the ongoing of revenue shrinking.

The *print on demand* idea is very well explored. Especially in the case of small numbers of copy of which the sale numbers cannot be anticipated very well there is potential. Nevertheless, usually extra ICT investments to build up a second printing infrastructure are needed for the publishing houses. In particular, for small (specialized) publishing houses this can be a hurdle.

In case of *individualized goods* the potential is explored in first approaches. But moreover, it is necessary to identify scenarios which would fulfil the conditions. And still there is a deficit in modelling the opportunity costs of individualization.

The identified works about *interactive information goods* focus a specific interactive good, namely interactive TV. The analysis has shown that those approaches are rather media integrating information goods which are delivered via TV, than interactive goods as defined. Knowledge about the potential of those approaches does not exist.

The state of the art in case of *mobile information goods* is characterized by a discussion which is undifferentiated. It is not distinguished between successful usage of offline content (especially music) and at date less successful online content. Moreover, a funded classification of thinkable surplus value, and user scenarios grouped along with, is missing (top down approach). Besides this, further research is needed in technological implementations.

Digital rights management systems are not matured technologically. For this reason, there are a lot of acceptance hurdles from the user's perspective. Moreover, it is not clear, if the user wants to accept any kind of limited usage of content. A lot of further research is needed in case of acceptance research and in case of technological layout as well.

The *procipient-concept* can only be found seldom in literature. Merely, the model of GEHRKE resp. the potato-system is an example for the procipient-concept as it was defined. In theory, the given economic analysis is convincing. To date we do not know if it would work in practice.

In the case of *open access* we can identify a tremendous lack of well done research in terms of objectiveness and structures. Less thee idea itself than the scholarly reflection of which therefore is at the very beginning and a large intellectual potential can be identified.

Finally, we can point out that most of the ICT based innovations in media industries are technology driven while they do not address both, any need of recipients or any in-house need of rising effectiveness or efficiency. Likewise, to date it was not successful to arouse new recipients requirements because of which any of those innovation could be used.

See the following table for a summary of the above statements.

Approach	**Benefit analyses state of the art**
Cross Media Publishing	Not possible to give statements in general
Print on Demand	High potential in case of small numbers of copy of which the progress of sale cannot be anticipated very well Extra ICT Investments necessary
Individualized Information Goods	First approaches are given, bit more research needed. Especially in modeling opportunity costs.
Interactive Information Goods	No existing statements in case of current kinds of interactive information goods
Mobile Information Goods	Current reflections are undifferentiated Thinkable surplus value needs classification
Digital Rights Management	ambiguous potential Less recipients acceptance because poorly conceived
Recipient as producer (procipient)	Model in theory convincing Practical use needs to be screened
Open Access	Objective and well structured works are seldom

Figure 43: Potential of the presented ICT based innovations

List of references

Anderson 2005: Anderson, C.: The Long Tail. http://www.wired.com/wired/archive/12.10/tail.html?pg=1&topic=tail&topic_set=, December 12th 2005.

Association of Research Libraries 2004: Association of Research Libraries: Monograph and Serial Expenditures in Research Libraries. http://www.arl.org/stats/arlstat/graphs/2004/monser04.pdf, October 15th 2005.

Ball 2000: Ball, R.: Der Wissenschaftler als Informationsanalphabet? Von der Vielfalt der Informationssysteme und der Überforderung der Bibliothekskunden. In: B.I.T. Online (2000) 2, p. 157-166.

Bargheer 2006: Bargheer, M.: Open Access und Universitätsverlage: Auswege aus der Publication Crisis? In: Hagenhoff, S. (Ed.): Internetökonomie der Medienbranche, Göttingen 2006, im Druck.

Becker 2004: Becker, J. U.: File Sharing in Peer-to-Peer-Netzwerken: ökonomische Analyse des Nutzerverhaltens, Wiesbaden 2004.

Becker/Clement 2003: Becker, J. U./Clement, M.: Schwerpunktaufsatz - Generation Napster -- Das ökonomische Kalkül eines Anbieters von Mediendateien bei Filesharing-Diensten - Filesharing, Peer-to-Peer, Öffentliche Güter, Freeriding, Spieltheorie, Lebenszyklus. In: Wirtschaftsinformatik Braunschweig; Wiesbaden 45 (2003) 3, p. 261-272.

Beckert 2001: Beckert, B.: Interaktives Fernsehen im Kontext staatlicher Programme für die Informationsgesellschaft: eine vergleichende Implementationsstudie von Info 2000 und NII. Interaktives Fernsehen im Kontext staatlicher Programme für die Informationsgesellschaft: eine vergleichende Implementationsstudie von Info 2000 und NIIhttp://tumb1.biblio.tu-muenchen.de/publ/diss/ws/2001/beckert.pdf <http://www.gbv.de/du/services, January 16th 2006.

Bergstrom 2001: Bergstrom, T. C.: Articles - Free Labor for Costly Journals? In: The journal of economic perspectives 15 (2001) 4, p. 183-198.

Brandtweiner 2000: Brandtweiner, R.: Differenzierung und elektronischer Vertrieb digitaler Informationsgüter, Düsseldorf 2000.

Buchreport 2005: Buchreport: Buchreport Magazin. http://www.buchreport.de/, December 15th 2005.

Bullinger et al. 2003: Bullinger, H. J./Einhäupl, K. M./Gaethgens, P./Henkel, H./Kröll, W./Winnacker, E.: Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. http://www.zim.mpg.de/openaccess-berlin/berlin_declaration.pdf, January 16th 2006.

Bundesverband der Phonographischen Wirtschaft 2004: Bundesverband der Phonographischen Wirtschaft: Jahreswirtschaftsbericht. Jahreswirtschaftsbericht 2004http://www.ifpi.de/, December 10th 2005.

Business Software Alliance 2005: Business Software Alliance: Piracy Study. http://www.bsa.org/globalstudy/upload/2005-Global-Study-English.pdf, December 12th 2005.

Buxmann 2004: Buxmann, P.: Erste Ergebnisse einer empirischen Untersuchung zur Nutzung von Tauschbörsen und Download-Plattformender Musikindustrie. http://www.zukunftsmusik.net/downloads/zm_ergebnisse.pdf, August 11th 2005.

Buxmann et al. 2005: Buxmann, P./Pohl, G./Johnscher, P./Strube, J.: Strategien für den digitalen Musikmarkt. Preissetzung und Effektivität von Maßnahmen gegen Raubkopien. In: Wirtschaftsinformatik 47 (2005) 2, p. 118-125.

Böning-Spohr 2003: Böning-Spohr, P.: Controlling für Medienunternehmen im Online-Markt: Gestaltung ausgewählter Controllinginstrumente, Göttingen 2003.

Böning-Spohr/Hess 2001: Böning-Spohr, P./Hess, T.: Zum Veränderungsbedarf im Verlagscontrolling. In: Weber, J./Schumann, M. (Ed.): E-Business Controlling: Einordnung, Umsetzung, externe Sichtweise, funktionales E-Controlling, Wiesbaden 2001, p. 40-58.

Clarke 1999: Clarke, R.: Electronic Commerce Definitions. http://www.anu.edu.au/people/Roger.Clarke/EC/ECDefns.html, December 12th 2005.

Clement 2005: Clement, M.: Ökonomie der Musikindustrie, Wiesbaden 2005.

Corinth 2005: Corinth, E.: Schlechte Aussichten fürs Kino. http://www.heise.de/tp/r4/artikel/20/20844/1.html, September 1st 2005.

Dahm/Rössler/Schenk 1998: Dahm, H./Rössler, P./Schenk, M.: Vom Zuschauer zum Anwender: Akzeptanz und Folgen digitaler Fernsehdienste, Münster 1998.

Detecon & Diebold Consult 2003: Detecon & Diebold Consult: Vortragsmanuskript, München 2003.

Deutsche Presseagentur 2005: Deutsche Presseagentur: Vergebliches Warten auf Zuschauerandrang. http://www.giessener-anzeiger.de/voba/artikel1864061.html, November 30th 2005.

Drösser/Hamann 2003: Drösser, C./Hamann, G.: Die Jobs-Maschine. In: Die Zeit, May 15th 2003, p. 19-20.

European Information Technology Observatory and European Economic Interest Group 2005: European Information Technology Observatory and European Economic Interest Group: European Information Technology Observatory 2005, Berlin 2005.

Fenton/Romano 1998: Fenton, H. M./Romano, F. J.: On-demand printing: the revolution in digital and customized printing, Upper Saddle River, New Jersey [u.a.] 1998.

Filmförderungsanstalt 2005: Filmförderungsanstalt: Marktdaten Kinoergebnisse. http://www.ffa.de/, December 13th 2005.

Fink 2002: Fink, L.: Economies of Aggregation - Internetportale als Informationsgüterbündel und die Zahlungsbereitschaft der Nachfrager, Köln 2002.

Forcher 1996: Forcher, R.: Entwurf einer Logistik-Dienstleistung zur Personenmobilität: ein Beitrag der Logistik zur Gestaltung von Mehrfachnutzungssystemen für Personenkraftwagen, 1996.

Friedrichsen 2004: Friedrichsen, M.: Globale Krise der Medienwirtschaft? Dimensionen, Ursachen und Folgen, Baden-Baden 2004.

Gehrke 2004: Gehrke, N.: Peer-to-Peer-Applikationen für elektronische Märkte: Perspektiven für eine hochgradig dezentralisierte digitale Wirtschaft, Wiesbaden 2004.

Gehrke/Burghardt/Schumann 2002: Gehrke, N./Burghardt, M./Schumann, M.: Eine mikroökonomische Analyse des Raubkopierens von Informationsgütern: ein Marktmodell. In: Weinhardt, C./Holtmann, C. (Ed.): E-Commerce: Netze, Märkte, Technologien, Heidelberg 2002, p. 21-42.

Gesellschaft für Konsumforschung 2002: Gesellschaft für Konsumforschung: Brennerstudie 2002. http://www.ifpi.de/news/192/index-Dateien/frame.htm, December 12th 2005.

Gesellschaft für Konsumforschung 2005: Gesellschaft für Konsumforschung: Brennerstudie 2005. http://www.ifpi.de/wirtschaft/brennerstudie2005.pdf, December 12th 2005.

Giddens 1992: Giddens, A.: Die Konstitution der Gesellschaft: Grundzuege einer Theorie der Strukturierung, Frankfurt a. M. [u.a.] 1992.

Giesler 2003: Giesler, M.: Collective risk. In: Risikoökonomie: Spektren des Risikos in Wirtschaft und Gesellschaft (Ed.): Marburg 2003, p. 125-151.

Griebel/Tscharntke 1999: Griebel, R./Tscharntke, U.: Analyse der Etatsituasituation wissenschaftlicher Biblitohekten 1998/99, Teil 1 und 2, München 1999.

Grimm 2003: Grimm, R.: Digital Rights Management: technisch-organisatorische Lösungsansätze. In: Digital Rights Management (Ed.): Berlin [u.a.] 2003, p. 93-106.

Grimm 2005: Grimm, R.: DRM-Techniken und ihre Grenzen. In: Picot, A./Thielmann, H. (Ed.): Distribution und Schutz digitaler Medien durch Digital Rights Management, Berlin [u.a.] 2005, p. 85-96.

Grisebach 2005: Grisebach, R.: Findet die digitale Revolution in der Verlagsbranche nicht statt? In: Picot, A./Thielmann, H. (Ed.): Distribution und Schutz digitaler Medien durch Digital Rights Management, Berlin [u.a.] 2005, p. 43-60.

Haank et al. 2004: Haank, D./Lex, A./Hilf, E./Mittler, E.: Thema: Open Science. In: Medienwirtschaft 1 (2004) 3, p. 143-151.

Hachenberger 2003: Hachenberger, J.: Intellektuelles Eigentum im Zeitalter von Digitalisierung und Internet: eine ökonomische Analyse von Missbrauchskalkülen und Schutzstrategien, Wiesbaden 2003.

Hagen 2002: Hagen, L. M.: Riepls Gesetz im Online-Zeitalter. EineSekundärnanalyse über die Grenzen der Substitution von Massenmedien durch das Internet. http://www.mediasprut.ru/jour/beitraege/riepl.shtml,

Hanekop/Tasch/Wittke 2001: Hanekop, H./Tasch, A./Wittke, V.: SOFI-Mitteilungen Nr. 29/2001, Soziologisches Forschungsinstitut an der Georg-August-Universität Göttingen, Göttingen 2001.

Hanekop/Wittke 2006: Hanekop, H./Wittke, V.: Das wissenschaftliche Journal und seine möglichen Alternativen: Veränderungen der Wissenschaftskommunikation durch das Internet. In: Hagenhoff, S. (Ed.): Internetökonomie der Medienwirtschaft, Göttingen 2006, p. 217-239.

Hankop/Wittke 2006: Hankop, H./Wittke, V.: Die Entwicklung neuer Formen mobiler Kommunikation und Mediennutzung. In: Hagenhoff, S. (Ed.): Internetökonomie der Medienbranche, Göttingen 2006.

Hasebrink/Krotz 1996: Hasebrink, U./Krotz, F.: Die Zuschauer als Fernsehregisseure? Zum Verständnis individueller Nutzungs- und Rezeptionsmuster, Baden-Baden 1996.

Hass 2003: Hass, B.: Desintegration und Reintegration im Mediensektor: wie sich Geschäftsmodelle durch Digitalisierung verändern. In: E-Merging Media: Kommunikation und (Ed.): E-Merging Media: Kommunikation und Medienwirtschaft der Zukunft, Berlin [u.a.] 2003, p. 33-57.

Hess 2004: Hess, T.: Medienunternehmen im Spannungsfeld von Mehrfachverwertung und Individualisierung - eine Analyse für statische Inhalte. In: Zerdick, A./Picot, A./Schrape, K./Burgelmann, J./Silverstone, R./Feldmann, V./Heger, D. K./Wolff, C. (Ed.): E-Merging Media, Berlin [u.a.] 2004, p. 59-78.

Hess 2005a: Hess, T.: Quo vadis, Media? Die Medienbranche im Spannungsfeld zwischen Technologie und Nutzer . http://www.internetoekonomie.net/docs/zf2005/03_Hess_Intermedia.pdf, (a)

Hess 2005b: Hess, T.: Digital Rights Management Systeme: eine Technologie und ihre Wirkungen. In: Picot, A./Thielmann, H. (Ed.): Distribution und Schutz digitaler Medien durch Digital Rights Management, Berlin [u.a.] 2005, p. 15-22. (b)

Hess et al. 2005: Hess, T./Figge, S./Hanekop, H./Hochstatter, I./Hogrefe, D./Kaspar, C./Rauscher, B./Richter, M./Riedel, A./Zibull, M.: Technische Möglichkeiten und Akzeptanz mobiler Anwendungen - eine interdisziplinäre Betrachtung. In: Wirtschaftsinformatik Braunschweig; Wiesbaden 47 (2005) 1, p. 6-16.

Hildebrand 1997: Hildebrand, V. G.: Individualisierung als strategische Option der Marktbearbeitung: Determinanten und Erfolgswirkungen kundenindividueller Marketingkonzepte, Wiesbaden 1997.

Hippel 1986: Hippel, E. v.: Lead Users: A Source of Novel Product Concepts. In: Management science 32 (1986) 7, p. 791-805.

Hoch 2003: Hoch, U.: Strategie und Management für Fachmedien. In: Wirtz, B. E. (Ed.): Handbuch Medien- und Multimediamanagement, Wiesbaden 2003, p. 203-221.

Holtrop 2003: Holtrop, T.: Content-Kooperationen in der digitalen Medienwirtschaft: T-Online auf dem Weg zum Internet-Media Network. In: Büttgen, M./Lücke, F. (Ed.): Online-Kooperationen: Erfolg im E-Business durch strategische Partnerschaften, Wiesbaden 2003, p. 165-175.

Hotelling 1929: Hotelling, H.: Stability in competition. In: The economic journal 39 (1929) p. 41-57.

Hradil 2002: Hradil, S.: Mobilität. In: Endruweit, G./Trommsdorff, G. (Ed.): Wörterbuch der Soziologie, Stuttgart 2002,

Institut für Strategieentwicklung 2004: Institut für Strategieentwicklung: Digitale Mentalität. http://download.microsoft.com/download/D/2/B/D2B7FE98-CA92-4E18-ACD6-94A915B4CAFF/Digitale_Mentalitaet.pdf, December 20th 2005.

Jacob 1995: Jacob, F.: Produktindividualisierung: ein Ansatz zur innovativen Leistungsgestaltung im Business-to-Business-Bereich, Wiesbaden 1995.

Kaspar 2006: Kaspar, C.: Individualisierung und mobile Dienste in der Medienbranche, Göttingen 2006, to be printed.

Kaspar et al. 2006: Kaspar, C./Seidenfaden, L./ Ortelbach, B./Hagenhoff, S.: Akzeptanz mobiler Mediengüter von Kunden deutscher Publikumsverlage. In: Lehner, F. (Ed.): Multikonferenz Wirtschaftsinformatik, Passau 2006, to be printed.

Kaspar/Wersch 2005: Kaspar, C./Wersch, O. v.: Playboy Mobile von Tomorrw Focus AG. In: Hess, T./Hagenhoff, S./Hogrefe, D./Linnhoff-Popien, C./Rannenberg, K./Straube, F. (Ed.): Mobile Anwendungen - best practices in der TIME-Branche: sieben erfolgreiche Geschäftskonzepte für mobile Anwendungen, Göttingen 2005, p. 45-55.

Keller 2005: Keller, A. D.: Elektronische Zeitschriften: Grundlagen und Perspektiven, Wiesbaden 2005.

Kiefer 2003: Kiefer, M.: Entwicklung der Mediennutzung und des Nutzungsverhaltens im Bereich der aktuellen Medien. In: Wirtz, B. W. (Ed.): Handbuch Medien- und Multimediamanagement, Wiesbaden 2003, p. 31-63.

Kleinz 2005: Kleinz, T.: Nature: Wikipedia nahe an Encyclopaedia Britannica. http://www.heise.de/newsticker/meldung/67380, December 12th 2005.

Kotkamp 2001: Kotkamp, S.: Electronic Publishing, Karlsruhe 2001.

Kotler 1989: Kotler, P.: From Mass Marketing to Mass Customization. In: Planning Review 17 (1989) 5, p. 10-13.

Lancaster 1971: Lancaster, K.: Consumer Demand, New York 1971.

Liebowitz 2004: Liebowitz, S.: What are your results? http://www.utdallas.edu/~liebowit/knowledge_goods/kolemanletter.htm, December 12th 2005.

Linde 2005: Linde, F.: Ökonomie der Information, Göttingen 2005.

Loebecke 1999: Loebecke, C.: Electronic Trading in On-line Delivered Content. In: Sprague, R. (Ed.): Proceedings of the 32nd Hawaii International Conference on System Sciences, 1999.

Mayer 1993: Mayer, R.: Strategien erfolgreicher Produktgestaltung: Individualisierung und Standardisierung, Wiesbaden 1993.

McCabe 2002: McCabe, M. J.: Journal pricing and mergers: a portfolio approach. In: The American economic review 92 (2002) 1, p. 259-269.

McCabe/Snyder 2004: McCabe, M./Snyder, C.: Georgia Institute of Technology, University of Atlanta, 2004.

Meffert 1994: Meffert, H.: Marktorientierte Führung von Dienstleistungsunternehmen: neuere Entwicklungen in Theorie und Praxis. In: Die Betriebswirtschaft 54 (1994) 4, p. 519-541.

Meier 2002: Meier, M.: Returning science to the scientists: der Umbruch im STM-Zeitschriftenmarkt unter Einfluss des Electronic Publishing, München 2002.

Michel 2000: Michel, S.: Qualitätsunterschiede zwischen Dienstleistungen und Eigenleistungen (Prosuming) als Herausforderung für Dienstleister. In: Dienstleistungsqualität: Konzepte - Methoden - Erfahrungen (Ed.): Wiesbaden 2000, p. 71-86.

Mildner 2004: Mildner, G.: Erlös(-ung) für die Musikindustrie - läßt sich von Open Source lernen? In: Friedrichsen, M./Schenk Michael, (Ed.): Globale Krise der Medienwirtschaft, Baden-Baden 2004, p. 119-138.

Mowshowitz 1992: Mowshowitz, A.: On the market Value of Information Commodities I-III. In: Journal of the Amercan Society for Information Science 43 (1992) 3, p. 225-248.

Müller-Lietzkow 2004: Müller-Lietzkow, J.: Thema: Open Science (2). In: Medienwirtschaft 1 (2004) 4, p. 193-203.

NZZ Online 2005: NZZ Online: Google Print wird nur Gewinner und keine Verlierer haben. http://www.nzz.ch/2005/11/11/em/articleDB7UM.html, December 12th 2005.

Nöth 2002: Nöth, U.: Die Individualisierung von Inhalten mittels PoD als Chance für den Buchverlag, Frankfurt am Main [u.a.] 2002.

Oberholzer/Strumpf 2004: Oberholzer, F./Strumpf, K.: The Effect of File Sharing on Record Sales. An Empirical Analysis. http://www.unc.edu/~cigar/papers/FileSharing_March2004.pdf, October 10th 2005.

Orsdel/Born 2003: Orsdel, L. V./Born, K.: Big Chill on the Big Deal?. In: Library journal 128 (2003) 7, p. 51-57.

Pagel 2004: Pagel, S.: Digitale Wertschöpfungsprozesse in Medienunternehmen. In: Friedrichsen, M./Schenk, M. (Ed.): Globale Krise der Medienwirtschaft? Baden-Baden 2004, p. 287-303.

Patalong 2005: Patalong, F.: Enyzklopädie-Vandalismus: Wikipedia verschärft die Regeln. http://www.spiegel.de/netzwelt/politik/0,1518,388801,00.html, December 5th 2005.

Peppers/Rogers 1996: Peppers, D./Rogers, M.: Strategien für ein individuelles Kundenmarketing: die 1:1 Zukunft, München 1996.

Petrison/Blattberg/Wang 1993: Petrison, L./Blattberg, R./Wang, P.: Data Base Marketing. Past, Present, and Future. In: Journal of Direct Marketing 7 (1993) 3, p. 27-43.

Piller 2001: Piller, F. T.: Mass Customization: ein wettbewerbsstrategisches Konzept im Informationszeitalter, Wiesbaden 2001.

Plinke 2001: Plinke, M.: Publishing on Demand: vom Manuskript zum Selbstverlag: wie Sie Ihr Buch herstellen und verkaufen: Internet, Buchhandel, Direktvertrieb, Berlin 2001.

Price Waterhouse Coopers 2005: Price Waterhouse Coopers: German Entertainment and Media Outlook: 2005-2009. http://www.pwc.com/Extweb/pwcpublications.nsf/docid/C3A3CC7C707F052E8025709D0030670C, June 10th 2005.

Rafaeli 1988: Rafaeli, S.: Interactivity - From New Media to Communication. In: Hawkins, R./Wiemann, J./Pingree, p. (Ed.): Advancing Communication Science: Merging Mass and Interpersonal Process, Newbury 1988, p. 110-134.

Raffée 1994: Raffée, H.: Chancen und Risiken des interaktiven Fersnehenn für öffentlich-rechtliche Fernsehanstalten aus Sicht des Marketing. In: Reinhard, U. (Ed.): Interaktives Fernsehen, Dokumentation der 2. Veranstaltung zum Thema "Rundfunk-Marketing" an der Universität Mannheim am 26.4.1994, Heidelberg 1994, p. 23-37.

Rawolle 2002: Rawolle, J.: Content Management integrierter Medienprodukte: ein XML-basierter Ansatz, Wiesbaden 2002.

Riepl 1913: Riepl, W.: Das Nachrichtenwesen des Altertums: mit besonderer Rücksicht auf die Römer, Berlin 1913.

Ringlstetter et al. 2005: Ringlstetter, M. J./Kaiser, S./Bode, P./Salditt, T.: Die Krise in der Musikindustrie: Handlungsoptionen für eine Rückkehr zum profitablen Geschäft. In: MedienWirtschaft 2 (2005) 3, p. 105-115.

Rogers 1995: Rogers, E. M.: Diffusion of innovations, New York, NY [u. a.] 1995.

Roosendaal et al. 2003: Roosendaal, H. E./Huibers, T. W./Geurts, P. A. M./van der Vet, P. E.: Changes in the value chain of scientific information: economic consequences for academic institutions. In: Online CD-ROM review 27 (2003) 2, p. 120-128.

Roosendaal/Geurts/van deer Vet 2001: Roosendaal, H./Geurts, P. A./van deer Vet, P. E.: development in scientific communication: Considerations. In: Information Services & Use 21 (2001) p. 13-32.

Rosenbach 2005: Rosenbach, M.: Versilberte Altlasten. In: Der Spiegel 50 (2005) 50, p. 194-196.

Schenk/Wolf 2004: Schenk, M./Wolf, M.: Ist die Medienkrise zu Ende? Status Quo im Werbemarkt. In: Friedrichsen, M./Schenk, M. (Ed.): Globale Krise der Medienwirtschaft? Dimensionen, Ursachen und Folgen, Baden-Baden 2004, p. 35-43.

Schrape 1995: Schrape, K.: Digitales Fernsehen: Marktchancen und ordnungspolitischer Regelungsbedarf, München 1995.

Schult 2005: Schult, T. J.: Lernen vom Schinken in Scheiben. http://www.zeit.de/2004/43/C-Enzyklop_8adien-Test?page=1, December 12th 2005.

Schulze 2005: Schulze, B.: Mehrfachnutzung von Medieninhalten: Entwicklung, Anwendung und Bewertung eines Managementkonzepts für die Medienindustrie, Lohmar 2005.

Schumann/Hess 2005: Schumann, M./Hess, T.: Grundfragen der Medienwirtschaft: eine betriebswirtschaftliche Einführung, Berlin [u.a.] 2005.

Schumann/Tzouvaras 2003a: Schumann, M./Tzouvaras, A.: Referenzmodelle für den unternehmensübergreifenden Leistungsprozess von Buchverlagen. In: Wirtz, B. W. (Ed.): Handbuch Medien- und Multimediamanagement, Wiesbaden 2003, p. 223-247. (a)

Schumann/Tzouvaras 2003b: Schumann, M./Tzouvaras, A.: Qualitätsunsicherheit in der Medienindustrie. In: Das Wirtschaftsstudium 33 (2003) 2, p. 197-201197-201. (b)

Schönbach 1994: Schönbach, K.: Lob der Faulheit. In: Süddeutsche Zeitung, May 16th 1994, p. 58-60.

Seidenfaden/Hagenhoff 2004: Seidenfaden, K./Hagenhoff, S.: Arbeitsbericht Nr. 8/2004 des Instituts für Wirtschaftsinformatik, Abteilung Wirtschaftsinformatik II, Universität Göttingen, Göttingen 2004.

Seidenfaden/Ortelbach/Hagenhoff 2005: Seidenfaden, L./Ortelbach, B./Hagenhoff, S.: Arbeitsbereicht Nr. 23/2005, Institut für Wirtschaftsinformatik, Abteilung Wirtschaftsinformatik II, Universität Göttingen, Göttingen 2005.

Seidenfaden/Ortelbach/Hagenhoff 2006: Seidenfaden, L./Ortelbach, B./Hagenhoff, S.: Neue Formen der Wissenschaftskommunikation: eine fallstudienbasierte Typologisierung, im Druck.

Shapiro/Varian 1999: Shapiro, C./Varian, H. R.: Information rules: a strategic guide to the network economy, Boston, Mass. 1999.

Siegrist 2003: Siegrist, H.: Geschichte und aktuelle Probleme des geistigen Eigentums (1600-2000). In: Zerdick, A./Picot, A./Schrape, K./Burgelmann, J./Silverstone, R./Feldmann, V./Heger, D. K./Wolff, C. (Ed.): E-Merging Media, Berlin [u.a.] 2003, p. 313-332.

Sjurts 2002: Sjurts, I.: Strategien in der Medienbranche: Grundlagen und Fallbeispiele, Wiesbaden 2002.

Statistisches Bundesamt 2005: Statistisches Bundesamt: Preisindizes. http://www.destatis.de/themen/d/thm_preise.php, December 12th 2005.

Stein/Jakob 2003: Stein, T. M./Jakob, H.: Schrumpfende Märkte und neue Vertriebswege als Herausforderung für die strategische Unternehmensführung in der Musikindustrie. In: Wirtz, B. W. (Ed.): Handbuch Medien- und Mulitmediamanagement, Wiesbaden 2003, p. 465-482.

Stelzer 2000: Stelzer, D.: Digitale Güter und ihre Bedeutung für die Internet-Ökonomie. In: Das Wirtschaftsstudium 29 (2000) 6, p. 835-842.

Stintzing 6.-8.10.2004: Stintzing, H.: Open Access versus Urheberrecht. In: Bekavac, B./Hergel, J./Rittberger, M. (Ed.): Informationen zwischen Kultur und MArktwirtschaft. Proceedings des 9. Internationalen Symposiums für Informationswissenschaft, Chur 6.-8.10.2004, p. 433-456.

Theurer 2004: Theurer, M.: Die Musikindustrie zweifelt am Kopierschutz. In: Frankfurter Allgemeine Zeitung, 04.06.2004, p. 18.

Toffler 1980: Toffler, A.: The Third Wave, London [u.a.] 1980.

Trepte et al. 2004: Trepte, S./Reinecke, L./Richter-Matthies, A./Adelberger, C./Fittkau, J.: Von Jägern und Sammlern-Motive des MP3-Sharings in Abgrezung zum CD-Kauf. In: Hasebrink, U./Mikos, L./Prommer, E. (Ed.): Mediennutzung in konvergierenden Medienumgebungen, München 2004, p. 199-220.

Tzouvaras 2003: Tzouvaras, A.: Referenzmodellierung für Buchverlage: Prozess- und Klassenmodelle für den Leistungsprozess, Göttingen 2003.

Verband Deutscher Zeitschriftenverleger 2005: Verband Deutscher Zeitschriftenverleger: Der deutsche Zeitschriftenmarkt. http://www.vdz.de/pages/static/1814.aspx, November 5th 2005.

Vorderer/Knobloch 1998: Vorderer, P./Knobloch, S.: Wie erleben Rezipienten interaktive Fernsehfilme? In: Schanze, H./Kammer, M. (Ed.): Interaktive Medien und ihre Nutzer, Band I, Baden-Baden 1998, p. 157-174.

Walter/Hess 2003: Walter, B. v./Hess, T.: WI -- Innovatives Produkt - iTunes Music Store -- Eine innovative Dienstleistung zur Durchsetzung von Property-Rights im Internet - Peer-to-Peer, Filesharing, Digital-Rights-Management, Property-Rights. In: Wirtschaftsinformatik 45 (2003) 5, p. 541-546.

Wehn 2005: Wehn, K.: Trotz Kino-Krise voller Optimismus und Kampfgeist. http://www.heise.de/tp/r4/artikel/20/20963/1.htmlhttp://www.heise.de/tp/r4/artikel/20/20963/1.html, September 18th 2005.

Weidenmann 1989: Weidenmann, B.: Der mentale Aufwand beim Fernsehen. In: Groebel, J./Winterhoff-Spurk, P. (Ed.): Empirische Medienpsychologie, München 1989, p. 134-149.

Wirtz 2001: Wirtz, B. W.: Electronic Business, Wiesbaden 2001.

Wirtz 2005: Wirtz, B. W.: Medien- und Internetmanagement, Wiesbaden 2005.

Wittmann 1959: Wittmann, W.: Unternehmung und unvollkommene Information: Unternehmerische Voraussicht, Ungewissheit u. Planung, Opladen 1959.

Wohlfahrt 2004: Wohlfahrt, J.: Akzeptanz und Wirkungen von Mobile-Business-Anwendungen, Hamburg 2004.

Woll 2005: Woll, C.: Kölner Arbeitspapiere zur Bibliotheks- und Informationswissenschaft Nr. 46, Fachhochschule Köln, Köln 2005.

Woodward/Pilling 1993: Woodward, H./Pilling, S.: The International Serials Industry: an overview. In: Woodward, H./Pilling, p. (Ed.): The International Serials Industry, Hampshire 1993, p. 1-22.

Würtenberger/Oetker 2003: Würtenberger, P./Oetker, M.: Die multimediale Erweiterung von Printmarken und neue Wertschöpfungssteigerungen. In: Wirtz, B. W. (Ed.): Handbuch Medien- und Mulitmediamanagement, Wiesbaden 2003, p. 249-263.

Zerdick et al. 1998: Zerdick, A./Picot, A./Schrape, K./Artopé, A./Goldhammer, K./Lange, U. T./Vierkant, E./López-Escobar, E./Silverstone, R.: Die Internet-Ökonomie: Strategien für die digitale Wirtschaft, Berlin 1998.

Zibull/Riedel 2005: Zibull, M./Riedel, A.: Mobile Entertainment von Media Republic. In: Hess, T./HAgenhoff, S./Hogrefe, D./Linnhoff-Popien, C./Rannenberg, K./Straube, F. (Ed.): Mobile Anwendungen - best practices in der TIME-Branche: sieben erfolgreiche Geschäftskonzepte für mobile Anwendungen, Göttingen 2005, p. 65-75.

o. V. 2004: o. V.: Interview: Ist Wikipedia der Tod von Brockhaus und Co.? http://www.golem.de/0407/32001.html, 02.07.2004.

w.a. 2003: w.a.: IFA: Musicload.de - kaum Fortschritte beim Musikverkauf. http://www.mpex.net/news/archiv/00443.html, December 12th 2005.

w.a. 2005a: w.a.: Gegen die Flaute. In: Der Spiegel 52 (2005) 52, p. 116.

w.a. 2005b: w.a.: Brockhaus kritisert Wikipedia. http://www.golem.de/0508/39687.html, December 12th 2005.

w.a. 2006a: w.a.: Das Langenscheidt Fremdwörtebuch Online. http://www.langenscheidt.de/index.html.

w.a. 2006b: w.a.: The Budapest Open Access Initiative. http://www.soros.org/openaccess/, January 16th 2006.