# Content Providers Benefiting from Commerce on the Internet

## Current Deficiencies, Proposed Solutions, and Foreseeable Business Trends

**Claudia Loebbecke**
University of Cologne
Wilh.-Backhaus-Str. 23
50931 Koeln, Germany
Tel.: +49-221-444 900
e-mail: claudia.loebbecke@uni-koeln.de

## Abstract

This paper analyzes the business environment for content providers on the Internet. Currently, especially small content providers do not generate sufficient additional profit from their Internet operations. Satisfactory Internet security, the feasibility to pay small amounts via the net, and manageable content saleability are outlined as major prerequisites for content providers to successfully participate in Internet business. For each of the three prerequisites, innovative software and hardware-based approaches are discussed and evaluated. Finally, the paper briefly investigates potential impacts of the according approaches on the Internet business environment.

## 1 Research Objective

From a simplified business perspective the players involved in commercial activities on the Internet can be divided into three main groups: content providers[1], Internet providers (including connectivity providers), and customers. While many content providers, whose Internet activities are not their core business[2], are excited about the new possibilities offered by the net, they still face the challenge to transform these opportunities into sufficient profit. However, Internet-based commerce will only grow significantly in the near and medium-term future, if it becomes attractive for all players involved.

In this context, the paper tries

- to analyze the current pitfalls of conducting business on the Internet from a content provider perspective,
- to describe, conceptionally classify, and evaluate the most important approaches currently under development to eliminate these pitfalls, and

---

1 Any Internet user who offers information (content) to be placed on the Internet.

2 When using the term 'content provider', this paper focuses on the Internet and does not refer to companies like CompuServe, America Online, Europe Online, Microsoft Network, etc.

- to briefly describe and assess potential impacts of these approaches on business processes conducted via the Internet.

## 2 Background: Current Business Environment for Content Providers on the Internet

For many people the Internet has turned into a primary information resource. Additionally, it is considered a valuable means of communication offering the enticing possibility of interaction. Currently, the Internet is mostly used as a marketing tool; only in some cases it serves as a sales channel [Ellsworth, Ellsworth, 1995; Bournellis, 1995]. Most of the information spread on the WWW[3] is either company information (public relations) or product information (marketing) to increase awareness [e.g., Kotler, 1991]. As with traditional marketing media, such information is offered free of charge [Meffert, 1986].

In most companies, the cost of content provision on the Internet is not covered by the contributions of Internet sales to total sales yet [Glossbrenner, Glossbrenner, 1995; Shah, 1995]. It is more the belief that the Internet presence will lead to a competitive advantage, or will turn into a competitive necessity in the future [see also Bakos, 1991; Benjamin, Wigand 1995; Clemmons, McFarlan, 1990].[4]

A advantage of using the Internet results from customers´ easy access to information. Currently, however, it is difficult for content providers to transform this advantage into extra income. Due to the tradition of free information on the Internet [Cronin, 1995] and the insecurity of digital payment [Fuhs, 1995-a].

Two content provider situations are to be distinguished:

(1) The main product to be sold is a material product (cars, coffee, computers) that cannot be delivered via the Internet. In this case the content provider (e.g., of WWW pages) uses the Internet as a marketing medium. Such marketing efforts are only efficient if a satisfying number of additional product units can be sold.

To expand the commercial use of the Internet, suppliers of material products either have to be able to use the net for various administrative processes such as receiving orders and payment, and providing customer service (process / business reengineering) [Cash, Konsynsky, 1985; Hammer, Champy, 1992], or they have to extend their product line by information-based products, for example by providing access to a special database, and thus becoming content providers (new business opportunity) [Davenport, 1993; Venkatraman, 1991].

(2) The product offered consists of information that can be transmitted in digital form via the Internet (e.g., software, magazines, music, etc.). In this case, full Internet commercialization would mean a closed business cycle from 'order' via 'payment' to 'receipt of the product' on the net.[5]

---

3 World-Wide Web.

4 Some rather radical believers in the Internet forecast that companies without an Internet presence will quickly fade from view [Locke, 1993].

5 'Virtual enterprises' [Davidow, Malone, 1992; Hopland, 1995; etc.] could operate from anywhere on the

In both situations, additional cost pressure for vendors results from the market transparency regarding suppliers, customers, and products on the Internet. Offers from all over the world can be found and compared online. This transparency is further increased by the employment of search tools ('bargain finders') [Jaros-Sturhahn, Loeffler, 1995].

To provide the Internet with long-term commercial success, additional costs of Internet use, especially content provision, has to be exceeded by additional income. For content providers this can only be achieved if the role of the Internet can be shifted from primarily being a 'marketing instrument' to a 'sales channel'.

Beyond marketing, content providers expect payment for the content they offer. Distributors (e.g., Internet providers) 'transport' the information from content providers to customers, comparable to a common carrier[6] expecting payment for this 'intermediary' service. Consequently, customers, as recipients of the information, should be charged for both: the information supplied by content providers and the transportation offered by Internet providers. If Internet providers manage to enhance their service line beyond pure transmission, e.g., with value added services, this should allow them to charge consumers in addition to the transmission fee [Barua, Ravindran, Whinston, 1995; Herrmanns, Flegel, 1992-b].

## 3 The Case of the Internet Book Shop

The Internet Book Shop (IBS)[7], a UK-based company with 14 employees ind Internet related positions (November 1995), is one of the largest online book shops world-wide. It offers the possibility to search for and order books 24 hours a day. The IBS database contains more than 750,000 books in various languages as well as a large selection descriptions, contents, reviews, and sample chapters.

Founded in 1993, the IBS has been online since June 1994. At the beginning, customers had to send their orders by regular mail on a form that could be downloaded from the IBS WWW pages. This procedure did not comply with Internet users´ expectations of an online book shop; no books were sold [Mattocks, 1995]. In September 1994, the IBS introduced payment by credit card (details via fax) and offered ordering via e-mail; however, no online ordering support for customers was available yet. During that month only three books were sold. Five months later, in February 1995, the IBS implemented a direct online ordering facility in combination with offline accounts (set up via telephone or fax) for personal data. On the first day, 61 books were sold. The average sales figure rose to about 50 books per month. Finally, in September 1995, online customer support for ordering as well as online credit card payment facilities were implemented. These innovations led to new sales peaks of 1,200 to 1,500 books per month.

---

globe where Internet access is available. The need for a physical presence at a certain location would be limited to legal requirements.

6 For simplicity reasons, the actual net operator such as the telecom carriers are not considered separately in this paper.

7 http://www.bookshop.co.uk.

While the IBS´ competitive strength in comparison to a regular book shop is based on the offer to search for books without leaving one's office or home, the company cannot transform this advantage into extra profit. The increasing number of free information features (including database extensions and an innovative user interface) provided by the IBS, successfully resulted in a higher frequentation of the company´s WWW pages (2.5 million hits per month). However, actual book sales increased only marginally.

Two lessons can be learnt from the IBS example:

(1) Information services should be turned into a separate product line and customers should have to pay for accessing these services.

The IBS online service offers a sophisticated search engine regarding authors, titles, subjects, etc., but cannot charge the consumer for accessing its popular database.[8] However, as other companies[9] offer similar book databases and information services free of charge, the introduction of access fees would rather lower frequentation of the IBS database than generate extra income for the service.

(2) Secure methods are crucial for extended commerce on the Internet.

The IBS sales history clearly indicates that it is not sufficient to offer easy ordering procedures. Internet users still hesitate to transmit personal information such as credit card details via the Internet. Having to use telephone or telefax to transmit personal data creates additional barriers to buying, as this requires an extra activity and incurs further costs. Convenient payment methods are needed to conduct business on the Internet. Evidently, Internet security is a prerequisite for easy and safe payment, just as easy and safe payment is a prerequisite for content saleability and hence for successful sales via the Internet.

# 4 Prerequisites for Content Providers Benefiting from Commerce on the Internet

Net security, digital payment, and content saleability are prerequisites for content providers benefiting from commerce on the Internet.

**Net Security**

Internet security is still insufficient for widespread commercial use of the net [v. Leeuwen, 1995]. With the increasing tendency of sending confidential and sensitive information[10] on the Internet, security becomes crucial. The number of security breaches and the damage caused is probably much higher than companies admit [—, Information Week, 1995-a]. High-quality security measures provide a crucial prerequisite for digital payment via the

8 Customers accept the common 'account/password/flat rate approach' only in rare cases.

9 E.g., http://www.books.com or http://www.wordsworth.com.

10 Corporate: orders, research results, or private: telephone and electricity bills, job applications, etc.

Internet [Carter, 1995; Rankl, Effing, 1995], and thus are imperative for the Internet to become an extensively used infrastructure for conducting business.[11]

Information and communication technology (ICT) security consists of three elements: integrity, privacy, and reliability [Coopers & Lybrand (ed.), 1988]. Internet security requires a clear authentification of senders and addressees. The sender has to be sure that the information goes to the address that he sends it to [Meli, 1994]. On the other hand, the addressee has to be sure that the address stated as sender and represented by his Internet Protocol (IP) address is correct and true (integrity). Unambiguous identification is important concerning the validity of contracts 'signed' on the Internet. Furthermore, confidentiality and inaccessibility of information transmitted via the Internet should be guaranteed (privacy). The common practices to fulfil the privacy requirement are (1) to control information access via passwords and (2) to encrypt the information, and thus making it useless/unreadable without the code to decrypt it. Finally, the constant availability of servers and transmission equipment, e.g., short system down times, is crucial for regular information exchange (reliability) [Kent, 1993].

**Payment**

Once Internet transmissions are considered to be secure, there will be efficient and easy ways to pay for the information services / products consumed. This will allow content providers to receive payment for the information they offer (including small fees for single WWW pages, articles or searches); business in the sense of a fair 'give and take' can start off.

**Content Saleability**

The content provider as producer often needs an Internet provider to distribute the information that he wants to sell. The information supplied to the Internet provider must be decrypted; thus, the content provider has no possibility to prevent illegal copying, sale or misuse by the Internet provider. The customer, who has bought the decrypted information, can offer it on the Internet himself. In countries where this is not illegal, there is no way to hold him responsible for such actions.

As long as (1) it is hard to collect small amounts for one or two pages of contents, and (2) contents offered via the Internet can be copied easily (even if it is illegal), it becomes very hard to make a profitable business out of offering contents on the Internet.

# 5 Steps towards Profitable Content Provision on the Internet

This section outlines currently available and 'upcoming' approaches for content providers benefiting from commerce on the Internet following the three levels of prerequisites introduced in the previous section.

**Net Security**

---

11 100% security does not exist, neither in daily life nor on the Internet. Using available security solutions, the Internet can be much safer than telephone or telefax which have been widely used in business processes for many years [Fuhs, 1995-a].

Software-based approaches comprise non-physical security measures that rely on software. Well-known examples are common password-based access protection mechanisms and data encryption programs. The necessary software is often supplied with the Internet access software.[12]

The idea of hardware-based approaches is to create a physical barrier within the computer which resists attacks from the outside, e.g., by malicious software such as viruses, worms, trojan horses (including password sniffers) [Bugovics, 1995; Tardif, 1995]. Data is encrypted and decrypted on a hardware basis. Such a hardware-based approach could be implemented by equipping users with a unique dedicated security chipthat has its individual physical 'fingerprint'. This uniqueness makes it impossible to copy the chips.[13]

With a hardware-based approach, passwords or user's Personal Identification Numbers (PIN) would be worthless without the physical possession of the hardware device (e.g., the security chip). If the hardware device gets lost or stolen, it can immediately and individually be cancelled by reporting the loss to the validation center (similar to credit card procedures). Hardware approaches do not depend on any operating system and normally do not block valuable system resources.[14] They can be applied with various infrastructures such as satellite channels, CD-Rom, etc. and also allow for the creation of 'private, closed networks' that employ the Internet as 'carrier'. They offer companies the possibility to integrate the Internet as an element into their overall information and communication infrastructure.[15]

**Approaches to Digital Payment**

Software-based Approaches

In the following, three software-based digital payment approaches will be described that tackle the problem from different perspectives and with varying business ambitions. For the content providers, however, it does not matter whether the doors to Internet commerce will be opened by

---

12 Netscape (http://home.netscape.com) has been criticized for the missing integrity of the electronic mail functions in its software (with the old Netscape Browsers, e-mail could be sent under a false sender address simply by entering the address of another Internet user). The new Browser Netscape Navigator 2.0 contains additional security features to solve the integrity problem. As soon as the user installs the new Navigator 2.0, a hardcoded pin is generated. Specific central processing unit data is combined with the Internet Protocol (IP) number to an individual number code. This code cannot be modified. If the user changes the IP-number or the name, the number code will not coincide with the hardcoded pin. Consequently, the sending of e-mail under a false sender address should become more difficult [Cortese, Hof, 1995].

13 The chips store the necessary security mechanisms. The complete communication concerning identification, authentication and electronic fingerprint is performed inside.

14 Blocking system resources can be a hindrance for the transmission of large data volumes (multi-media, videoclips, etc.) using software solutions [Bugovics, 1995]

15 An example of such a dedicated security chip is the 'MeChip' developed by the German 'Information Technology Entwicklungs' (ESD) GmbH. To allow easy installation and compatibility, 'MeChips' are offered in a number of versions which all can easily be integrated into existing payment systems of credit card companies or banks. [There are external plug&play and internal versions based on single in-line memory modules (SIMMs) or PC-Cards. Available are also 16bit card version (AT-Bus) and a design-in chip. Prices for 'MeChips' currently vary between US$ 17 and US$ 34, depending on the version.]

(1) credit card institutions that aim at enhancing their security mechanisms in order to migrate their digital payment procedures to the Internet, and thus to participate in upcoming business activities that are completely run on the net,

(2) by newly established intermediary companies (third parties), whose main services lie in bundling offers as well as managing orders and payment procedures,

(3) by companies offering direct electronic cash.

*ad (1) Approaches Proposed by Credit Card Institutions*

With current credit card payments on the Internet, users simply send their credit card details to the service provider involved, and the credit card organization handles this payment like any conventional one. However, the insecurity of the Internet leads to resistance of Internet users to disclose their credit card details; the low security standard poses a real threat for credit card companies.[16] Therefore, credit card data is increasingly encrypted before it is transferred over the Internet. Three examples of such efforts are to be mentioned:

Visa and Microsoft are developing a joint solution for safe transactions via credit cards, the 'secure transaction technology' (STT)[17]. In a different alliance, Mastercard is cooperating with Netscape, IBM, GTE and Cybercash to develop an independent, licence-free concept called 'secure electronic payment protocol'[18]. The Belgian Company 'Europay' in cooperation with IBM proposes a concept called 'Interpreter' [v. Wauwe, 1995]. Its software solution converts simple, standardised and high-level instructions into a terminal-specific processing language.[19] This concept significantly reduces the size of software in the terminal memory and thus allows the application to be on a SmartCard[20] instead of on the system.

*ad (2) Approaches Proposed by Intermediary Companies*

Different from credit card institutions, intermediary companies (third parties) collect and approve payments from one client to another. At regular intervals, a single credit card transaction for an accumulated total is carried out.

**GlobeOnline**[21] is an example of such an intermediary company; it offers a cyber mall/store front with integrated digital payment facilities. Customers receive individual electronic purses which they have to load with credit in advance. They can buy information and products until the purse is empty. Customers pay for the information or services with credits

---

16 Damages through card misuse could lead to very high costs due to the difficulty of detection and the almost impossible criminal persecution. Furthermore, in comparison to the current practice in the traditional credit card sector (where security also plays a critical role), in the Internet context there will not be any cost-efficient way to provide insurance against potential security failures [Bugovics, 1995].

17 Under the current agreement, Microsoft will receive a percentage of each transaction as licence fee [ftp://www.visa.com/visa-stt/stt-downloads.html].

18 http://www.mastercard.com/Sepp/Sepploc/loc, [—, Computer-Zeitung, 1995].

19 Both the Visa/Microsoft and Mastercard/Netscape/IBM/GTE/Cybercash approaches are written for each terminal individually in machine language [van Wauwe, 1995].

20 Although smartcard technology is making steady progress, it is not yet used near its potential, since for many applications, e.g., electronic purses (see below) or bank cards, it has been very difficult to achieve the high level security at a low enough cost [European Commission, 1995.].

21 http://www.globeonline.fr.

from their electronic purse just as anonymously as if it were cash. They do not have to transmit any personal details or credit card numbers to GlobeOnline. If an outsider (illegally) succeeds in obtaining a password, the possible damage is limited to the credit in the electronic purse. The system offers the possibility to pay small fees for selected information on the Internet (e.g., WWW-pages, articles, etc.) without the cumbersome necessity of creating a new account with each additional content provider.[22] Once the electronic purse is empty, it can be replenished online thus keeping transaction costs low.

*ad (3) Companies Offering Direct Electronic Cash*

Various electronic cash (e-cash) concepts[23] are under development as alternatives to currently used payment methods. E-cash is the electronic equivalent of cash using credit units that are stored in digital form on a chip, PC or some other memory device. During payment the credit units are transferred from one PC to another (or from chip to chip). The credit units are bought in advance with real money from a licensed bank [Chaum, 1994; Godschalk, 1995].Two examples of e-cash (still under development) are to be mentioned:

'Mondex' is an electronic cash system developed by the British NatWest Bank and Midland Bank in cooperation with British Telecom, which is currently in the testing phase in Swindon (UK).[24] Besides paying at a cash register, digital money can also be transferred from one card to another using a device with the size of a calculator. 'Mondex' SmartCards need special card readers; no online payment on the Internet is yet possible [Henke, Wanke, 1995].

The Dutch DigiCash Group is cooperating with the American Mark Twain Bank to develop an e-cash concept named 'DigiCash'[25] based on manipulation-proof files which are equivalent to 'coins'.[26] When e-cash is exchanged between two partners, the transaction is validated by the bank. Thus e-cash can neither be copied nor spent more than once.

*Evaluation of the three software-based digital payment approaches*

Online payment using credit cards is not cost-efficient, when low value transactions are concerned. The integration of 'intermediate companies' allows for economic transactions of small sums, but (1) the representation in the cyber mall has to be paid for, and (2) the customer must set up an account in advance of purchasing services or goods. Using e-cash offers the highest flexibility concerning payment. Even low-cost content can be provided profitably, although all content must be prepaid. The e-cash option is still being tested on the Internet. Preliminary results indicate that e-cash will allow a rather secure and anonymous transfer of small values between two parties.

---

22 With the 'GlobeOnline' purse customers can only subscribe to the information of those content providers that are members of GlobeOnline's store front/cyber mall.

23 E.g., solution proposed by Digicash [http://www.digicash.com] or by the CAFE-Consortium [Carter, Stanford, 1995].

24 'Mondex' is based on a SmartCard that can store up to 500 Pounds Sterling. About 6000 cards have been issued, another 34,000 are to be issued by the end of 1995.

25 'DigiCash' received the first price of the 'Information Technology European Awards', a contest sponsored by the European Commission, November 1995.

26 http://www.digicah.com/ecash/ecash-home.html.

Hardware-based Approaches

Electronic payment requires appropriate software programs, no 'hardware only' approach can provide for digital payment possibilities on the net. One solution is the combination of an effective software approach with a dedicated security chip is necessary. Every chip user is registered with a specific chip provider, similar to a credit card company, with whom the payment method is agreed upon in advance (bill, credit card, etc.). As the Internet does not stop at country borders, international payment systems have to take this fact into account. An integrated country code in such security chips could make identification of the country possible for official purposes (taxes, statistics, etc.).

### Approaches to Content Saleability

Software-based approaches that specifically tackle the issue of content saleability (as described above) are not known to the author. The hardware-based approach of a dedicated security chip, however, is not limited to certain processes or functions such as digital payment. In an appropriate business and system environment, a dedicated security chip could also support content saleability.

Once users have installed such a chip, they could download demo-versions of the products they are interested in. The rest of the product would be downloaded at the same time in encrypted form. To decrypt the information, customers have to buy the product by transmitting the chip number installed in their PC. Then they either transmit the necessary details for payment, or the validation center directly initiates the money transfer from customer to content provider for the product bought. Once the payment has been transferred, customers get a validation number from the validation center which allows them to decrypt the information on their specific system (i.e., which has the chip with the correct ID). With the dedicated security chip concept each digital product would only have to be encrypted once, before it is distributed on the Internet.

## 6 A First Evaluation of Software versus Hardware-based Approaches

Both, software and hardware-based approaches must keep convenience in mind. The trade-off between cost and convenience on the one hand and security on the other will be at the users' discretion. Essential for extending commerce on the Internet, and hence for content providers benefiting from it, is the adherence to one standard. Otherwise the Internet might break up into a large number of smaller, closed networks with different access restrictions [Collet, 1995].

### Software-Based Approaches

The major strength of software approaches is the easy way of spreading the necessary software by incorporating it into the program software or by offering the possibility to download it from the Internet. However, software-based approaches are not yet sufficient for content saleability. More importantly, independent of the quality of the encryption algorithms or the codes used, any software-based system can be by-passed [Bugovisc, 1995; Fuhs, 1995-a]. The user can be attacked with Trojan Horses[27] that are transmitted using games or shareware. Trojan Horses read the necessary ID and private key data in the standardized communication software and wait until the passwords are entered by the user. During the next Internet session it sends the collected data to an IP-address somewhere in the world, or it waits for retrieval by its designer. After that, they delete themselves and thus do not leave any evidence of their existence. As Trojan Horses do not change any vital files, they have a good chance of survival. The user has no idea that his personal data is being transmitted to somebody else who can then access his accounts [Denning, 1990].

---

27 Malicious software, see section 5.

### Hardware-Based Approaches

The main advantage of high-quality hardware approaches is that malicious software-based attacks are impossible [Bugovics, 1995; Fuhs, 1995-a].[28] Consequently, they should complement software-based approaches to digital payment.[29]

A weakness of hardware approaches is the cost of each unit, which has to be individually produced, distributed and installed. Furthermore, hardware approaches can only be successful, once a specific concept, i.e., a specific chip type, has become a quasi-standard or standard, and has reached a critical mass among Internet users. Finally, once users have installed such a chip, their presence on the Internet can be verified at any time. While this may be positive, it might also cause problems regarding privacy issues and the protection of personal information.

## 7 Potential Impacts on the Internet Business Environment

It is hard to predict how business on the Internet will develop once the problems concerning digital payment and content saleability will be fully resolved. A vast increase in available information-based products and services, on average lower prices (including lower margins), and major shifts in industry structures as well as in intra-corporate value chains seem likely [Bakos, 1991; Benjamin, Wigand, 1995].

### Increase in Available Information-Based Products and Services

Secure transmission and payment solutions would result in lower entrance barriers to business on the Internet. Content providers (e.g., information service providers, software developers) would not need the infrastructure of a large company anymore to market their products.

With appropriate hardware solutions consumers could themselves become content providers. In such a scenario, consumers would request a product number from a validation center to market their content, encrypt the information, and make it available on the Internet. Once the product starts selling, the customer (as content provider) receives payment via the validation center.[30]

### Lower Prices (Including Lower Margins)

Locating and comparing potential suppliers of products or services on the Internet leads to low transaction costs [Benjamin, Wigand, 1995; for a detailed discussion see Barua, Ravindran, Whinston, 1995]. Other cost elements beyond coordination costs gain attention

---

28 This only applies if the dedicated security chip is free of faults in design.

29 The advantages of hardware approaches over software approaches in providing secure information transmission via electronic networks was already put into practice by the French bank 'Crédit Commercial de France' [Loebbecke, Jelassi, 1994] which developed a hardware device similar to the 'MeChip' approach to secure their home banking activities via PC and the French 'Minitel' system [Cats-Baril, Jelassi, 1994].

30 Even if nobody were to buy the products / services, the consumers, who have become content providers, would have practically no loss.

leading to considerable pressure on suppliers to reduce their prices to market level [Benjamin, Wigand, 1995]. Additionally, when a large number of companies are offering comparable products or services, competition will lead to constant pressure on market prices.[31]

**Shifts in Industry Structures**

Small content providers could offer their products world-wide. The integration of the Internet, databases, and CD-ROMs, etc. would allow them to have an edge over corporate giants, or at least offer them the chance to compete with big organizations. They could do research on new markets, test their ideas, build close ties to clients, and respond quickly to customers' needs without having to cover the overhead costs of a large corporation [McWilliams, 1995].

**Shifts in Inter-Corporate Value Chains**

Table 1 outlines two scenarios regarding potential sources of income for content providers and the according shifts in inter-corporate value chains once feasible and secure payment proce- dures will have been established on the Internet.

Table 1: Sources of income for content providers

| | **Content Provider** | **Service Provider** | **Consumer** |
|---|---|---|---|
| **Currently** | receives no payment for content provided | receives payment on time/volume basis | content mostly free, pays for time and volume |
| **Scenario 1** | receives payment based on content directly from the consumer | receives payment on time/volume basis | pays for content, time and volume |
| **Scenario 2** | receives a predefined 'share' from the Internet provider | 'shares' with content provider | pays for time/volume |

Scenario (1): Content providers receive payment for their content directly from the consumers, who not only have to pay the Internet providers, but also the content providers for the information they access. Therefore, competition for customers among content providers would begin to develop; hence, the quality of information would likely improve. The situation for Internet providers would mostly stay the same, unless - due to the higher 'Internet consumption price' for users - the overall Internet traffic would decrease drastically.

31 For many suppliers, keeping up with market prices will mean sacrificing part of the margin [Barua, Ravindran, Whinston, 1995].

Scenario (2): Content providers receive payment from the Internet providers who 'forward' part of their income to the content providers. Internet providers can only 'win' in this scenario if the low price of content and service in comparison to the previous scenario would lead to a drastic increase in overall Internet traffic. The situation for consumers would remain mainly the same.

Furthermore, once it becomes possible to charge small fees for products or services, Internet providers will likely shift their strategy towards 'service providers' offering value-adding services [Barua, Ravindran, Whinston, 1995].[32]

# 8 Conclusion and Outlook

The International Book Shop example illustrates some problems small content providers have on the Internet: In cases where the Internet is supposed to support the traditional business (e.g., book sales), the increasingly sophisticated services offered by such content providers go beyond pure marketing efforts. They provide additional value to the 'customers'. While these services constitute extra costs for the content providers, they barely generate additional profits. Potential clients take advantage of these services (e.g., search the book store database) without actually becoming customers.

To expand commerce on the Internet, providing content on the Internet has to be attractive for the providers in one of two ways:

(1) Internet usage clearly strengthens a company's competitive position with respect to its traditional products (e.g., additional sales as a consequence of Internet-based marketing; Internet as a sales channel for traditional produtcs). Example: The IBS database leads to a significant increase in book sales.

(2) Internet usage are expanded to additional, profitable product lines (e.g., sales of the Internet services). Example: The IBS can charge for reading their database either per page or based on time.

For content providers to benefit from commerce on the Internet and thus to expand such commerce, mainly the questions of Internet security, digital payment and content saleability must be solved satisfactorily. A number of companies have been frantically working on solutions to these problems. Several approaches are outlined and evaluated in this paper. Most likely, the system which becomes market standard, will not only lead to vast earnings for the developers, but also change the way business is conducted via the Internet. It will offer interesting and challenging business opportunities for established and new content providers.

One possible stream of further research may explore the above framework of changes in the intra-corporate value chain (section 7) from a theoretical and an empirical perspective. Which of the two scenarios mentioned will be relevant for which business sectors and/or industry structures? How will any of the two scenarios change the way business is done or

---

32 Applying a hardware-based solution will also bring chip providers with their own business interests as additional players into the inter-corporation value chain [adjusted from Benjamin, Wigand, 1995].

companies are organized? How will the relative market power along the inter-corporate value chain change? Can scenarios different from the two outlined ones foreseen? Responses to these research questions should allow further fine-tuning of the framework which tries to integrate profitable content providers into the game called 'doing business on the Internet'.

## References


Alexander, M., Mapping out the infobahn, *Datamation*, Vol. 41, No. 19, Oct. 15,1995, p. 24.

Bakos, Y., Electronic Marketplaces, *MIS Quaterly*, Sep. 1991, pp. 295-310.

Barua, A., Ravindran, S., Whinston, A., *Efficient Selection of Suppliers over the Internet*, Working paper of the Center for Information Systems Management, Graduate School of Business, University of Texas at Austin, May 1995.

Benjamin, R., Wigand, R., Electronic Markets and Virtual Value Chains on the Information Superhighway, *Sloan Management Review*, Winter 1995, pp.62-72.

Bournellis, C., Internet '95. The Internet phenomenal growth is mirrored in startling statistics, *INTERNET WORLD*, Vol. 6, No. 11, Nov. 1995, pp. 47-52.

Bugovics, J., Dezentrale Informationsdistribution, Conference Proceedings, *AIC Conference 'Online Marketing'*, Frankfurt/Main 1995.

Carter, B., Stanford, C., CAFE - A model for an international electronic purse, *Presentation of the European Information Technology Conference (EITC)*, Brussels, 27.-29. Nov. 1995.

Cash, J., Konsynski, B., IS Redraws Competitive Boundaries, *Harvard Business Review*, No. 2, 1985, pp. 134-142.

Cats-Baril, W., Jelassi, T., Managing Strategic IT Initiatives in the Public Sector, Establishing a National Information Technology Infrastructure: The Case of the French Videotex System, in: Jelassi, T. (ed.), *European Case Book on Competing Through Information Technology, Strategy and Implementation*, London 1994, pp. 166-198.

Chaum, D., *Prepaid SmartCard Techniques: A Brief Introduction and Comparison*, Amsterdam, Netherlands, 1995 (available from http://www.digicash.com).

Clemmons, E., Reddi, S., Some Propositions Regarding the Role of Information Technology in the Organization of Economic Activity, in: Nunamaker, J., Sprague, R. (eds.), *Information Systems: Collaboration Technology, Organizational Systems and Technology*, Proceedings of the Hawaiian International Conference on System Sciences, 1993, Vol IV.

Clemmons, E., McFarlan, W., Telecomm: Hook Up or Lose Out, *Revolution in Real Time: Managing Information Technology in the 1990s*, Harvard Business Review Book, Boston 1991.

Collet, R., The role of public data Internet service providers in corporate information networking, *Telecommunications*, Vol. 27, No. 1, Jan. 1995, pp. 50-55.

—, Konträre Lösungen der Kreditriesen, *Computer Zeitung* 46, 16.Nov. 1995, p. 8.

Coopers & Lybrand (ed.), *The security of network systems*, Report 1, London 1988.

Cortese, A., Hof, R., Looking for the next Netscape, *Business Week*, 23 Oct. 1995, pp. 58-59.

Cronin, M., *Doing More Business on the Internet: How the Electronic Highway is Transforming American Companies*, New York 1995.

Davenport, T., *Process Innovation: Reengineering Work Through Information Technology*, Boston 1993.

Davidow, W., Malone, M., *The Virtual Corporation*, New York 1992.

Denning, P., *Computer under attack: Intruders, worms, and viruses*, Reading, 1990.

Dratva, R., *WWW-based Home Banking Services in Switzerland: A Case Study*, St. Gallen, 1995 (Source: http://www-iwi.unisg.ch/cc/tc/papers.html).

—, Will your next computer be a tin can and a wire?, *The Economist*, 14 Oct. 1995, pp. 85-86.

Ellsworth, J.H., Ellsworth, M.V., *The New Internet Buiness Book*, New York 1996.

European Commission, Innovation Programme, Directorate General XIII (ed.), *Applying Information Technology, 101 Success Stories from Esprit*, Brussels, Luxembourg 1995.

Fox, R., Check it out, *Communications of the ACM,* Vol. 38, No. 10, Oct. 1995, p. 12.

Fuhs, H. (1995-a), Vorbeugende Maßnahmen vor Computerviren, *Datensicherheitsreport* , March 1995.

Fuhs, H. (1995-b), Sicherheitsaspekte bei Chipkarten, *Datensicherheitsreport*, June 1995.

Geising International (ed.), *Glossary of Bankcard Terms*, Internal Report, Cologne 1995.

Glossbrenner, A., Glossbrenner, E., *Making Money on the Internet*, NewYork 1995.

Godschalk, H., Electronic Cash ist mehr als nur ein digitaler Reisescheck für Internet-Surfer, *Computer Zeitung*, 16. Nov. 1995, p. 15.

Hamel, G., Doz, Y., Prahalad, C., Collaborate with Your Competitors - and Win, *Harvard Business Review*, Jan./Feb. 1989, pp. 133-139.

Hammer, M., Champy, J.A., What is reengineering? *Information Week*, 5 May 1992, pp. 10-24.

Henke, R., Wanke, O., Elektronische Geldbörse - Abschied vom Bargeld, *Focus*, No. 44, 30. Oct. 1995, pp. 208-212.

Hermanns, A., Flegel, V., Informations- und Kommunikationstechnologien als Bestandteile von innovativen Produkten und Produktsystemen, in: Herrmanns, A., Flegel, V. (eds.), *Handbuch des Electronic Marketing*, Munich 1992, pp. 429-446.

Hopland, J., Virtual Organization and Dynamic Business Structures, in: OFW (ed.), *Mehrwert Information*, Stuttgart 1995, pp. 175-190

—, Break-ins are rife (1995-a), *Information Week* , 9. Oct. 1995, p. 98.

Jaros-Sturhahn, A., Loeffler, P., Das Internet als Werkzeug zur Deckung des betrieblichen Informationsbedarfs, *Information Management*, No. 1, 1995, pp. 6-13.

Johnston, H., Vitale, M., Creating competitive advantage with interorganizational systems, *MIS Quaterly*, No. 6, 1988, pp. 153-65.

Jones, D., Navin-Chandra, D., IndustryNet : a model for commerce on the World Wide Web, *IEEE EXPERT*, Vol. 10, No. 5, Oct. 1995, pp. 54-59.

Kent, S. Internet Privacy Enhanced Mail, *Communications of the ACM*, Vol.36, No. 8, 1993, pp 48-60.

Kotler, P., Marketing Management: Analysis, Planning, Implementation, and Control, 7. ed., Englewood Cliffs 1991.

v. Leeuwen, P.: Doing business securely on the information highway, EDI WORLD. CANADIAN ELECTRONIC COMMERCE, Vol. 5, No. 10, Oct. 1995, pp. C6-C7.

Leiner, B., Internet Technology, *Communications of the ACM*, Aug. 1994, p.32.

Locke, C., *The Internet Business Journal*, Vol.1, No. 1, Jan. 1993.

Loebbecke, C., Jelassi, T., Home Banking: An IT-based Business Philosphy or a Complementary Distribution Channel? CORTAL 'versus' Crédit Commercial de France, in: Jelassi, T. (ed.), *European Case Book on Competing Through Information Technology, Strategy and Implementation*, London 1994, pp. 244-266.

Malamud, C., *Exploring the Internet: A Technical Travelogue*, Englewood Cliffs 1992.

Malone, T., Benjamin, N., Yates, J., Electronic markets and electronic hierarchies, *Communications of the ACM* Vol. 30, No. 6, 1987, pp. 484-97.

Malone, T., Yates, J., Benjamin, R: The Logic of Electronic Markets, *Harvard Business Review*, May/June 1989, pp. 166-172.

Mattocks, D., The Internet Book Shop: A Study of Internet Trading, Conference Proceedings, *AIC Conference 'Online Marketing'*, Frankfurt/Main 1995.

McWilliams, G., Small fry go online, *Business Week*, 20. Nov. 1995, pp.158-164.

Meffert, H., *Marketing - Grundlagen der Absatzpolitik*, 7. ed., Wiesbaden 1986.

Meli, H., *Sicherheitsmanagement in offenen Kommunikationssystemen*, Working Paper *IM2000/CCCTC/13*, St. Gallen, June 1994.

Porter, M., Millar, V., How Information Gives You Competitive Advantage, *Harvard Business Review*, July/Aug. 1985, pp. 149-160.

Rankl, W., Effing, W., *Handbuch der Chipkarten*, Munich 1995.

Reichwald, R., Rupprecht, M., Einsatz von Informations- und Kommunikationstechnologien im Rahmen zwischenbetrieblicher Kooperation, in: Herrmanns, A., Flegel, V. (eds.), *Handbuch des Electronic Marketing*, Munich 1992, pp. 407-428.

Schiller, J., Cryptography, *ON THE INTERNET*, Vol. 1, No. 4, Sept./Oct. 1995, pp. 16-19.

Schmid, B., Elektronische Märkte, *Wirtschaftsinformatik*, No. 5, 1993.

Shah, A., Business Need Analysis - Using Technology to Improve Customer Service, *Presentation of the European Information Technology Conference (EITC)*, Brussels, 27.-29. Nov. 1995.

Tardif, V.: Sniffers and spoofers. Most unencrypted Web transmissions are vulnerable because of a lack of a universal security scheme, *INTERNET WORLD*, Vol. 6, No. 12, Dec. 1995, pp. 32-34.

Venkatraman, N., IT-Induced Business Configuration, in: Scott Morton, M. (ed.), *Corporation of the 1990s*, New York - Oxford 1991, pp. 122-158

v.Wauwe, M., Cyber Money - The importance of increasing individual Banks´Strengths, Conference Proceedings, *AIC Conference 'Online Marketing'*, Frankfurt/Main 1995.

Weston, R., Five Ways to do Business on the Internet, *Inc. Technology*, 3, 1995, pp. 75-77.

## Acknowledgement

The very valuable contribution of Philipp Butzbach, Master Student in Business Administration at the University of Cologne is highly appreciated.

The following two scenarios elucidate the special security risks and the resulting requirements in an open network like the Internet:

If a company were able to read the offers that its competitors are sending to potential customers, it could provide the same product or service at a lower price. Thus the company would obtain an unfair (and illegal), but profitable competitive advantage. If the company were additionally able to change a competitor's offer, e.g., (illegally) increase the price and send it to the potential customer, the company's own bid would at least have a good chance of being 'ranked' better than the competitor's one.

The need of integrity also becomes obvious when customers are charged for certain information per page accessed or per data volume transmitted. When user 'Y' locks into a database using his password, the content provider identifies him as 'Y' based on his access code and password. At the end of the month, 'Y' receives a bill for all the pages that he read (similar to the concept of phone bills). If, in such a scenario, a hacker can obtain the access code and the password, he can get into 'Y'´s account and read the information which is then billed to 'Y'.