

# Measuring the Effectiveness of Electronic Commerce Websites with the Web Assessment Method

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## Abstract

Successfully conducting business on the Internet calls for new marketing paradigms that meet the requirements of the unique combination of its inherent characteristics: electronic markets, technological platform, and marketing issues. In this context, electronic markets are the framework in which market transactions are performed on the Internet. Underlying Internet technology forces marketing activities to be different from the ones applied to traditional sales channels and performance marketing is the essential ingredient for creating the best offering for the customer. The Web Assessment model unites these ingredients into a unified approach for the evaluation of commercial Web sites. The Web Assessment methodology has been developed over the last one and a half years and the initial ideas have appeared in conference proceedings (Selz and Schubert 1997a; Selz and Schubert 1997b, Schubert and Selz 1999). Based upon the Web Assessment methodology a software tool has been created in order to enable Web users to make an online evaluation of their favorite Web sites. The paper describes the underlying model and presents preliminary usage observations. The findings outlined in this paper were collected from participating Internet users who completed the online questionnaire. The data is a collection of subjective user assessments of various Internet commerce applications. There are various kinds of observations which can be made with the Web Assessment tool. We selected examples portraying a "single company profile" and an "inter-business comparison". The inter-business comparison is explored in more detail using the examples of two bookstores – the virtual Amazon.com versus the traditional bookseller Barnes & Noble.

## 1 Introduction

The Internet could be, at least from a technological point of view, the closest approximation of a perfect market and a frictionless economy. Ubiquitous information allows buyers to compare the offerings of vendors worldwide. One prediction of customer behavior claims that all marketing activity can be reduced to one factor, namely price. Writes Kuttner, for example, in *Business Week*: “*But in Net commerce, the whole premise is that consumers will be, and should be, fickle. So the comparison shopper can use Amazon's delightful book reviews and other nifty features and then disloyally buy the product from Barnes & Noble if the price is lower*” (Kuttner 1998).

However, there is anecdotal evidence to the contrary. Says a participant of our study who assessed the Amazon website: “*Hey, it's Amazon!...what more do we need to say :). Seriously, however, I chose this site because it is one of the best (I shop on the 'net for software, books other 'information' products quite a bit) and its BEST by far feature is the quality of personal service [...] and the quality of the push media...I rely in part on Amazon to give me information about book publishing - this service would itself be worth paying for and they do it for free, thereby hooking me absolutely.*”

Amazon apparently has found a unique Internet selling proposition by creating a loyal virtual community. That said, what precisely made Amazon more flourishing than its competitors? This question of “what makes Websites more attractive than the ones of the competition?” is the focus of the Web Assessment model. We aim at identifying possible success factors that differentiate one website from similar offerings within the same industrial sector. For one, as the Web has created a new marketing arena with new rules and new opportunities, Amazon employs a very distinctive marketing and website strategy.

Today, many approaches for the assessment of Internet marketing strategies (e.g. Dutta et al. 1997; Palmer and Griffith 1998) are based on existing marketing paradigms. As pointed out by Palmer and Griffith (1998) website design includes both marketing and technical issues. Next to that, the electronic realm creates entirely new marketing opportunities that call for new concepts. The Web Assessment model is based on the three market transaction phases – information, agreement, and settlement – and a special “community component”. The model goes beyond traditional concepts by dedicating special attention to the unique feature of the Internet to build loyal virtual communities.

The Web Assessment model does not focus on the electronic commerce strategy for a certain firm or the ex-ante decision of whether to go online and invest in this type of technology platform. Instead, the model provides a useful analysis of the quality of a commercial website from a consumer perspective. The model can be used by researchers and Internet marketers. Merchants might want to assess the status of their current website and develop ways for improvement. Researchers can use the model in order to identify best practice examples and to list strengths and weaknesses of existing sites from a consumer perspective.

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<sup>1</sup> Please refer to the appendix for addresses of websites.

The following sections present the theoretical background of the Web Assessment model<sup>2</sup>, introduce the analysis tool that has been developed, and present selected findings. The final conclusions discuss venues for further research.

## 2 Theoretical Background of the Web Assessment Model

### 2.1 Electronic Markets and Transaction Phases

Electronic markets are the environment in which players interact in the global electronic business media, such as the Internet. Malone et al. (1987) argue that new information technology (IT) infrastructures will allow to circumvent and eliminate intermediaries in both value systems and supply chains in particular and thus lead to the emergence of electronic markets. Electronic markets are first and foremost markets, institutions or mechanisms which serve the market participants to allocate resources (Williamson 1983; Schmid 1995). Information and communication technology are used to establish market places in cyberspace, to enable buyers and sellers to meet, evaluate offerings and negotiate digitally with little or no restrictions because of distance or time.

Moreover, it has long been established that information technology has significant impact on industrial organization as well as individual organizations. Malone et al. (1987) (see also Porter and Millar 1985; Nault and Dexter 1995) suggest that companies are changing the way they operate due to significant reductions in the cost of obtaining, processing, and transmitting information. A multitude of examples from different industrial sectors, like clothing, books, wine and tourism show the trend towards direct sales by the supplier or manufacturer to the final customer (e.g. Belz et al. 1991). However, the same emerging electronic marketplaces offer revenues and profits for specialized intermediaries. Technical and institutional obstacles, high information costs, missing transparency and security flaws – distinctive features of the Internet at the moment – provide a huge field for intermediation, in some cases even re-intermediation (Sarkar et al. 1996; Lee 1997).

Although the purpose of this paper is not to explore these changes in depth, it is important to note that these alterations imply a continuous evolution of the firms' value chains and industry value systems (Porter and Millar 1985; Rockart and Scott 1993), as IT transforms not only intra-organizational structures and processes but also the nature and structure of linkages between them, the interaction patterns with customers, and the transaction process as described in the next section.

#### Transaction Phases

A market transaction may be divided into three phases (Schmid 1993; Zbornik 1996) which are the information, agreement, and settlement phase.

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<sup>2</sup> A continuously updated documentation of this project can be found in the Web Assessment section of the NetAcademy on Business Media. (<http://www.businessmedia.org/>)

- **Information Phase**  
In the information phase customers collect information on potential products and services. They look for possible suppliers, asking for prices and conditions. The information phase covers the initial satisfaction of a consumer's need for information to reconcile his or her demand for a product or service with the offer.
- **Agreement Phase**  
Negotiations between suppliers and customers take place in the agreement phase. The phase serves to establish a firm link between supplier and buyer that will eventually lead to a contract, fixing details such as product specifications, payment, delivery, etc.
- **Settlement Phase**  
The last of the conventional steps is called settlement phase. The (physical/virtual) delivery of the product ordered will take place during this phase. Also possible after sales interactions like guarantee claims or help desk services occur.

In virtual environments, however, a further degree of interaction becomes a central issue. A reader who buys a book at Amazon.com is automatically a potential source for reviews. If many readers with similar tastes and preferences join her efforts, an online community of similarly minded people comes into existence. The notion of community lies at the heart of the Internet revolution.

- **Community Component / Personalization**  
The concept of "Community" which has been discussed in recent literature (Hagel and Armstrong 1997, Parks and Floyd 1995; Schuler 1996; Schubert and Selz 1999; Schubert 1999) serves as essential tie between two transactions. The communication taking place among customers and between customers and the firm, links the product more firmly to them. Shared interests allow for the building of communities that generate a certain level of trust among their respective members (Armstrong and Hagel 1996; Erickson 1997; Iacono and Weisband 1997; Figallo 1998) thus inspiring a fertile electronic commerce environment. The collection of shared community knowledge facilitates the personalization of the user interface and the product offering. Collaborative filtering methods generate suggestions for individual users based on the data of a community of like-minded people (using statistical techniques such as nearest neighbor algorithm). When a user selects a homepage, an EC Web site identifies the user and presents an individual welcome screen with pre-selected product suggestions. It is even thinkable to customize new products which are tailored to the needs of special sub-communities (e.g. insurance products for people who perform sports activities in the high-risk category) (Elofson and Robinson 1998).

When considering a world where people (consumers) are anonymous and empowered to create their own (and deliberately chosen) identity classical trading rules may prove not to be effective. Spar and Bussgang (1996) point to the fact that an absence of established business rules on the Internet may result in a commercial environment affected by insecurity. Virtual communities that set standards (e.g. Netiquette) will generate confidence and allow for the constitution of "*Trusted Intermediaries*" who guarantee generic services such as contracting, payment, logistics and security, and who serve as an entity transforming the anonymity and anarchy of the Internet into a market with identifiable customers and recordable transactions.

## 2.2 Technology and Media-inherent Characteristics

As mentioned before, the Web Assessment Model examines characteristics that are inherent to the Internet, such as 24-hour worldwide availability. Table 1 lists the core characteristics which were used to develop the Web Assessment criteria.

Media inherent characteristics	
1.	Hypermedia presentation
2.	Database interface (expert system)
3.	24-hour access (time)
4.	Anonymity
5.	Ubiquity (space)
6.	Asynchronous communication
7.	Configuration possibility (interactivity)
8.	Transfer of cost benefits to the customer

Table 1: Media-inherent characteristics

## 2.3 Marketing: Performance System

In marketing the term performance marketing (Belz et al. 1991) defines the quest to offer a customer not just the product itself, but to propose a specific solution for each individual customer need. Why should a company turn away from mass-marketing to individually tailored solutions? Customers today show a very rational and price sensitive behavior. A company thus cannot just offer the genuine product or service itself, but needs to offer integrated solutions embracing the following elements in order to successfully differentiate itself from the competition: i) core product/service, ii) a product system, iii) bundling, iv) complementary external offerings, v) price and quality arrangements, vi) delivery, vii) set-up and training, viii) continuous service agreements, ix) and an emotional customer experience. A sample resulting performance system in the case of an airline is shown in Table 2.

0	Product / Service System	Flight from Zurich to New York with Swissair, or packaged Swissair offer, e.g. flight Geneva – Amsterdam – Zurich
1	External Bundling	Combination of onward flight with partner airline, hotel arrangement, theater tickets, etc.
2	Generic Services	Integration of payments, logistics systems, e.g. airline credit card, city check-in, etc.
3	Customer specific: Additional Services	Focused offers, e.g. youth fares, package holidays, business packages, adventure trips, etc.
4	Emotional Customer Experience	Youth club, forum for frequent flyers or leisure travelers focusing on special destinations, e.g. Big Apple Club

Table 2: Retail (airline) example of a Performance System

### 3 The Web Assessment Tool

#### 3.1 The Web Assessment Tool

The Web Assessment Tool was designed and programmed in order to collect assessment data. The list of criteria was implemented into an online WWW form. The outline of the questionnaire was developed in accordance with the requirements listed in Kromrey's work (Kromrey 1998) about models and methods for the gathering and evaluation of empirical data and guidelines for the development of computer-supported questionnaires by Möhrle (Möhrle 1997). The questions were derived from the Internet-inherent characteristics (as listed above). In order not to overload the questionnaire we decided to restrict the number of questions for each transaction phase to the most important. Thus, not each of the media-inherent characteristics is represented in every transaction phase. This helps to keep the questionnaire short and to motivate assessors to proceed to the very end. The assessment scale varies from "I strongly agree" to "I strongly disagree" encompassing four different values. People often tend to choose the middle option of a given set of answers so we decided to implement an even number of values to encourage assessors to unveil their preferences either in favor or against the criterion. Besides, there is a "zero option" for saying "not applicable". This should be used whenever the criterion is not relevant for the website (e.g. logistics are not relevant in the case of digital products). Figure 1 is an excerpt of the online assessment form.

The screenshot shows a section titled "Phase 4: Community Component" with a link to an explanation. Below it is a table of assessment items with a Likert scale from 4 to 0. The scale labels are: 4 strongly agree, 3 somewhat agree, 2 somewhat disagree, 1 strongly disagree, and 0 not applicable. The items are: "Good Access to Community", "Uniqueness/Originality of Information (information is difficult to obtain from other sources)", and "Adequate Number of Members".

	4	3	2	1	0
Good Access to Community	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uniqueness/Originality of Information (information is difficult to obtain from other sources)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adequate Number of Members	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1: Excerpt of the Web Assessment Questionnaire

Each assessment question is accompanied by a detailed explanation which can be accessed via a hyperlink (📄). The Web Assessment Tool has been designed using Lotus Domino technology. The tool is part of the NetAcademy project which aims at the design of a system for the structuring, acquisition, mediation and dissemination of domain-specific scientific knowledge on the basis of a generic, Internet-based platform (Schubert et al. 1998; Lincke et al. 1998).

In a final section assessors are asked to rank the overall quality of the website. Remember that the best profile is not simply the one that includes the highest scores. The success of an electronic commerce site has to be judged separately according to financial success (from the vendor perspective) and fulfillment of customer needs and expectations (from a consumer perspective). The consumer perspective is examined in a final question where participants evaluate the general quality of the website. Finally, assessors are asked to unveil their level of experience with Electronic Commerce Websites.

### 3.2 Web Assessment Criteria

The following section describes the Web Assessment Criteria which were implemented into the online questionnaire.

#	Criterion	Explanation
1	Good user interface	The "user interface" assesses ease of use for frequent users as well as for first time visitors. This does also comprise loading times of pages and guidance in the interaction process with the Web site when completing a transaction.
2	Good structure of content	The "structure of content" measures ease of access as well as first and second impression of the logical structure of the content. Tables of contents, navigational frames or image maps are typical features to facilitate navigation.
3	Reasonable information quantity	The "quantity of information" focuses on the range of information on company, product and services.
4	Apparent benefits from stored customer profile (e.g. client-specific offers)	Most Web sites require customers to register or at least to supply some basic personal information. Good Web marketers should remunerate their customers for "revealing" this kind of information. This could be either by <ul style="list-style-type: none"> <li>• Directly crediting money or services, examples are <a href="http://www.bonusmail.com">www.bonusmail.com</a> and <a href="http://www.cybergold.com">www.cybergold.com</a></li> <li>• Granting discounts for product sales</li> </ul>
5	Good products/ service combination possibilities (cross-selling: combine products and/ or services)	"Combination possibility" examines the breadth of the product range and the possibility to combine various product offerings (either to the company's own products, or third-party goods/ services) online. It measures the amount of cross-selling, i.e. the combination of various goods/ services (such as an airline ticket and a hotel reservation).
6	Good availability/ performance of the system	"Availability/ performance" (in respect to geographical aspects) measures the global availability of the system. It judges the availability to customers regardless of their geographic location (e.g. different language versions). Special mirror sites could e.g. improve global performance. Since this aspect is one of the main advantages of the Internet it gains special consideration. "Availability/ performance" (in respect to time) measures the loading times, which are of great importance for user comfort.
7	Cost benefits passed on to the client	The use of electronic sales channels often reduces transaction costs. Provided that margins remain unchanged vendors should be able to offer products on their Web site at a lower price than in a comparable physical store.

*Table 3: Information Phase*

#	Criterion	Explanation
1	Adjustable customer profile (e.g. payment information)	Business transactions usually require customers to reveal some basic personal information, e.g. payment information. For a greater comfort this kind of information can be safely stored for reuse in a subsequent session.
2	Guided ordering according to profile (personalized services)	In order to receive a higher degree of personalized services customers could be willing to reveal additional information. Besides, the system might track user activity. A detailed user profile containing personal information such as age, gender, hobbies, preferences, etc. helps to treat each customer differently. This could result into guiding mechanisms, enable the system to come up with suggestions, or to even grant special client discounts.
3	Possibility of customized products	Some customers might be interested in buying combinations of products (product systems) or only fragments of a product (e.g. only parts of a magazine or newspaper). The Web site could support the customization of user-designed products.
4	Transparent, interactive integration of business rules	The underlying business rules should be transparent to the user. Business rules are general terms and conditions, guarantees, possibility for returning products, etc. Click buttons to accept terms and conditions and guided interaction are helpful in this context.
5	Good implementation of security issues (digital signature, secure server, TTPs)	Good Web sites should offer reliable security features (such as SSL, digital certificates, etc.) or implement accepted standards (e.g. SET, TRUSTe, P3P).

#	Criterion	Explanation
6	Good contact possibilities with vendor (help desk for problems during order process)	<p>"Contact possibility" examines the various ways to establish communication with the vendor. It may comprise the implementation of a help desk or a call center. The Web site could offer</p> <ul style="list-style-type: none"> <li>the opportunity to write and read questions of common interest (FAQs)</li> <li>a feedback possibility via E-Mail or Web forms (i.e. via the electronic medium)</li> </ul> <p>The feedback response times must be adequate to the medium used.</p>

*Table 4: Agreement Phase*

#	Criterion	Explanation
1	Easy selection of generic services	<p>"Generic services" are software modules that are available on the entire Web platform and always present themselves in a uniform interface. Generic Services support an electronic transaction (such as the purchase of a book online). Examples are electronic payment systems, logistics services, electronic contracting modules, etc. Their brick-and-mortar counterparts are power sockets, telephone hooks, water taps, and the postal system that should be the same wherever you are (this applies at least within the same country).</p> <p>An easy selection of such services means that they are integrated into the settlement process. Examples are the selection of different choices for e.g. payment systems (Ecash, credit card, SET, check, bill, etc.) or logistics services (UPS, FedEx, US Post, etc.). The tracking of order information should also be supported.</p>
2	Good integration of generic services	A good integration of such services means that they are sensibly used wherever necessary comforting the user by their common interface and their routine operation. Typical generic services in Electronic Commerce applications are payments, electronic contracting (dealing with prices and conditions) and logistics. Other Generic Services are: shopping carts, one bill for multiple shops, shopping lists, etc.
3	EC-application makes effective use of customer profile (e.g. payment and logistic information)	During the settlement of a business transaction some basic personal information need to be revealed (e.g. payment information or delivery address for physical goods). For a greater comfort this kind of information could be safely stored for reuse in a subsequent session.
4	Good tracing and tracking (e.g. direct access to personal order information)	A good example for an integration of a logistics service, (in this case of a third party) can be found at <a href="http://www.amazon.com">www.amazon.com</a> . After ordering customers are provided with information how to trace their order at the UPS tracking site.
5	Good IT-integration (connection with customer's infrastructure)	Especially for small and medium-sized businesses (SMEs) an export filter (a link to their accounting system) for financial data could be of great value (e.g. information can be exported into MS Money).
6	Convenient after-sales support	The Web site should also support the handling of after-sales services (e.g. guarantee form, feedback form).

*Table 5: Settlement Phase*

### Community Component

A commercial Web site should help to establish a relationship among customers on the one hand and between customers and the company on the other hand. It thus facilitates the means to establish a community of people sharing common interests. Customers interact and exchange information e.g. about experiences with company products or services. The information from customers to customers provides an additional level of confidence. The company gets the chance to directly respond to customer requests and needs, thereby strengthening the bond between the company and its clients.



#	Criterion	Explanation
1	Good access to community	<p>The following definition applies to the notion "Virtual Community":</p> <p>"Virtual Communities describe the union and the communication between individuals who share common values and interests and who use electronic media to get in touch with another. Their communication is independent from restrictions of time and place."</p> <p>These "Virtual Communities" may be loosely or more closely attached to a special Web site. A high value of the "access to community" criterion indicates a good link between the product offer and the community component of the Web site.</p>
2	Uniqueness/ originality of information (information is difficult to obtain from other sources)	<p>This criterion evaluates the value of the information that can be obtained from the community area. A community which includes experts who actively contribute to the community area might supply information that cannot be retrieved from other sources. TV Guide, for example, features online interviews between community members and movie stars and stores them on its Web site. In this case, the community area is really worth visiting.</p>
3	Adequate number of members	<p>The value of a community are its members. There must be some "key members" who show a special dedication to the community. Nevertheless, as the number of members increases so does the probability of good questions, answers, reviews and other contributions and hence a rich community experience.</p>
4	Well-implemented personalization and collaborative filtering mechanisms.	<p>When joining a community members are usually looking for people with similar tastes or interests. There are two main kinds of user profiles that can be stored in a community database</p> <ul style="list-style-type: none"> <li>• Personal information about interests and tastes entered by the user (self-assessment)</li> <li>• Tracking of interactions performed by the user (activity log)</li> </ul> <p>The self-assessment should contain a selection of pre-defined categories (e.g. gender, age, favorite music, etc.). This information is not subject to many changes whereas the activity log is meant to trace dynamic information (page accesses, market transactions). After a while the system may use the dynamic information to derive patterns of users' interest and behavior.</p> <p>Customers with similar tastes or needs are identified according to commonalities in their preference profiles. Based on these preference patterns mutual recommendation from customers to customers can be derived, sometimes even for new products that the customer was not aware of before (e.g. a new CD by his favorite pop group or a completely new product tailored to the needs of a special sub-community).</p>
5	Member may choose his/ her appearance within the community (e.g. choosing a personal avatar)	<p>Some Web sites offer the possibility to chose a representation of one's self (e.g. Worlds Away, Ultima Online). These representations are called "avatars". They appear in the form of animals, people, or characters from comics strips. Sometimes it is even possible to assemble the character choosing from a given set of heads, bodies, arms, etc.</p>
6	Privacy is sufficiently protected	<p>Sometimes you might gain access to a community forum without revealing personal information about yourself. There are clients who prefer the anonymity of the Web to the face-to-face encounter in a brick-and-mortar shop.</p>
7	Perceived real added-value from membership	<p>This criterion evaluates the value of membership. Besides the information that can be obtained from the community area there might be an additional value creation, e.g. in the establishment of personal relationships with other members. According to Armstrong and Hagel (1996) there do exist so-called "communities of relationship". Specific shared experiences of life are the basis of these communities. ParentsNet is one example for this type of community.</p>
8	Good, customized push mechanisms (information is automatically being sent to member)	<p>There are two different mechanisms to establish a customer relationship via E-Mail</p> <p>Push-Technique: The Web system automatically supplies the customer with information. Either the customer chooses to receive specific information updates or the information provider sends unsolicited information which might be of interest to an established or possible customer. Push mechanisms can be customized by customers. The information provider may offer different categories of information updates where the client can check boxes in order to receive the information required (examples are Netscapes In-Box Direct and Amazon.com).</p>
9	Good pull mechanisms (member can ask for information updates)	<p>Pull-Technique: The customer actively seeks information and retrieves this information on his / her own whenever needed. Pull effects are typically the result of ads, discounts or a good (visible) place in store shelves.</p>

Table 6: Community component

The criteria set forth in Tables 3 to 6 are intuitive but not necessarily exhaustive. To validate this particular set, it is necessary to develop survey measures, which capture these factors, and then correlate individual criteria measures with overall Web site assessment ratings. To date, we know of no comprehensive study assessing this or any other criterion set. We present this set as a first pass to stimulate discussion in the important area of developing metrics to evaluate Web sites.

## 4 Selected Findings

Over the last year we asked a number of people (researchers as well as practitioners) to use the Web Assessment Tool in order to assess their favorite websites, focusing especially on *online auctions* and *bookstores*. The resulting data sheets were collected and processed. So far, we were able to collect 70 data sheets from more than 55 different assessors. We asked the participants to evaluate only sites that they are really familiar with. Since each user usually has a limited set of favorite websites most people only made one or two assessments. The data thus represents a small sample of highly qualified user opinions.

The following section describes different ways of graphically evaluating the Web Assessment data and preparing them so that they can be used to analyze strengths and weaknesses of existing Web sites. First, we look at the singly company profile which gives an overview of the overall performance of a single Web site. We then compare different profiles of companies operating in the same business for an inter-company comparison.

In the following diagrams the x-axis represents the assessment criteria within the different transaction phases. The value range is from +2 (I strongly agree) to -2 (I strongly disagree). It is important to mention that the values do not represent the quality of the Web site (overall high scores do not equal a high-quality Web site). Rather the values indicate that the company did a good job in implementing certain Web Assessment Criteria on the one hand (0 to 2) or that there is still room for improvement on the other hand (0 to -2).

### 4.1 Single Company Profile

Amazon provides a unique case to illustrate how the Internet is actually changing the way consumers buy and sell products and services. The case of Amazon is well documented (e.g. Economist 1997; Kotha 1998). Today, Amazon sells books worth \$600 million (Economist 1999) out of total book retail sales in the United States of about \$25.5 billion in 1995. Recently, Amazon started selling videos, music, gifts, and even started a new Web site for online auctions.

Amazon differs from a physical bookstore. Customers can browse the online catalog containing over 2.5 million books, about ten times as many as the largest physical bookstore. The reviews and comments represent a unique attraction of the Web site. Newspapers such as The New York Times and readers add them to the system. The firm competes as information broker and not just as retailer of books as do most physical bookstores. Collaborative filtering mechanisms allow the company to come up with suggestions for suitable books. The company collects reviews from customers thus adding much of the editorial content of their site. As this content grows, it attracts others to add to the richness

of the mix thus creating a virtuous cycle. In essence this is an explicit attempt to create a community around the needs of transaction<sup>3</sup>. We will discuss importance of the community component for Amazon in more detail.

Orders for bestsellers are shipped immediately, other books are ordered directly from the publishers. Amazon is consistently undercutting the list price by as much as 40%. The company fulfills core value propositions such as convenience, selection, and service. The competition on price is fierce and competitors regularly even undercut Amazon excellent prices.

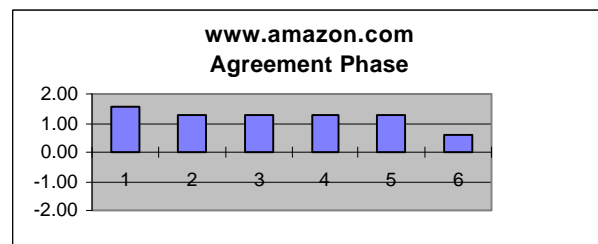
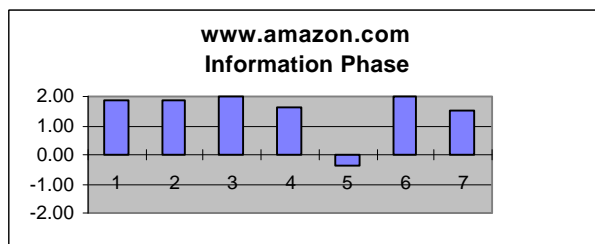
**Single Company Profile**

	Information Phase	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	Mean	Std. dev.
1	User Interface	2	2	2	2	2	2	1	2	1.88	0.33
2	Structure	2	2	2	2	1	2	2	2	1.88	0.33
3	Information Quantity	2	2	2	2	2	2	2	2	2.00	0.00
4	Benefits	2	2	-1	2	2	2	2	2	1.63	0.99
5	Combination Possibility	-2	0	2	-2	-1	0	-1	2	-0.33	1.48
6	Performance	2	2	2	2	2	2	2	2	2.00	0.00
7	Cost Benefits	2	2	2	1	2	-1	2	2	1.50	1.00

*Table 7: Single company profile for the information phase – Amazon*

Table 7 is an example for the aggregation of eight user opinions assessing the information phase of the Amazon Web site. The mean value displays the aggregated ratings. The deviation column illustrates the degree of consensus among the assessors. The zero value represents complete agreement, values higher than 1 indicate a high degree of discrepancy. Figure 2 below depicts the mean value graphically.

The sample shows complete agreement for the "quantity of information" (#3) offered on this site as well as for the overall "performance of the system" (#6). The criteria for "design of the user interface" (#1) and "structure of content" (#2) are also almost equally valued. Nevertheless, there is a discrepancy for "cost benefits" (#4) and "combination possibilities" (#5). A possible explanation could be that the assessors developed their opinion on different experiences with product offerings. There may be products on this server which are apparently cheaper than usual, making the benefit transfer obvious to the client. Other products, on the other hand, may already be sold at a very low margin in brick-and-mortar business which does not allow for even lower prices on the Web site. The same applies to "combination possibilities" which might be appropriate only for a limited range of products.



<sup>3</sup> See Schubert (1999) for a more detailed discussion of Virtual Communities of Transaction.

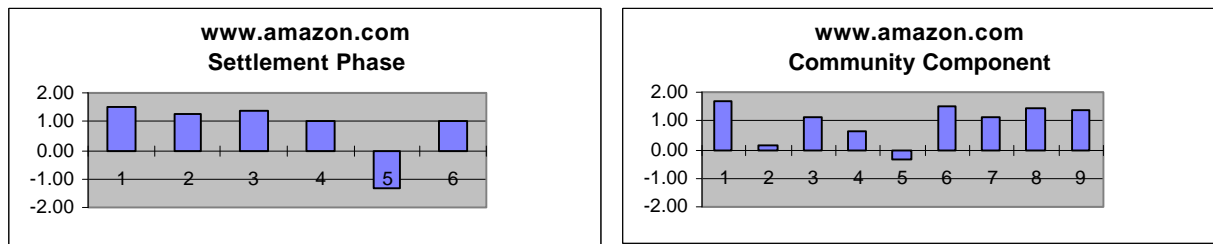


Figure 2: Single company profile of Amazon

Amazon received high values for the *information phase*. It offers a good user interface, good structure of content and a rich amount of useful information. In the case of Amazon, stored customer profiles allow the company to suggest books the reader might be interested in. The profile also supports the online order process as some information like address etc. does not need to be retyped again. The delivery and payment information is used for all repeating transactions. Except for the combination of books and music on one single Web site, there is no product bundling with complementary services. The system usually shows a good performance. Low prices imply a certain transfer of cost benefits to the customer.

The *agreement phase* shows positive results for all categories with a lower mark for “contact possibilities” (#6). The ordering process is well structured and the assessors were generally satisfied with services offered in the agreement phase. The lower mark for “contact possibilities” is most likely explained with the fact that if something goes wrong, people prefer a real (telephone) contact to solve the situation. Amazon lacks this facility. To keep costs low (a call-center is an expensive undertaking) most interaction is carried out by E-Mail.

The lowest mark in the *settlement phase* is the “IT-integration” (#5). Amazon properly manages all the information and immediately transfers them to its enterprise resource planning system and to business partners. However, there is no possibility to directly integrate this information on the customer’s computer system. People need to retype their orders into their own systems. A direct interface to the customer’s IT environment might not be necessary for business-to-consumer business but it could represent an asset in business-to-business relations.

The *community component* seems to be one of the key assets of the company for generating loyalty and repeat purchases. Amazon offers a good access to the community of book readers (#1). Even if the contents (summaries, comments, reviews, etc.) are, principally, also available from different sources the positive values of the second criterion show that the combination of “book reviews” (source: editors, newspapers, famous people) and “customer comments” (source: other readers) is valued by the customers. The number of active community members (#3) yielded fairly high values, an advantage that differentiates Amazon from its competition (cf. following section). The implemented mechanisms for collaborative filtering (#4) also received good grades. The possibility of choosing the personal appearance of representation of the user (#5) is apparently not important for a Web site that sells books (only negative value). Customers give their names when adding their comments but since the system does not examine their real identity they could as well be faked. The benefit from comments is

not linked to the real identity of the author. This is not unusual in the book business. Remember that book authors often use pseudonyms without losing readers' attention. The protection of privacy (#6) was highly judged by the assessors. This could be one of the reasons why customers do not hesitate to perform online orders at Amazon.com which shows a certain level of trust in the company and their Web site. The criterion "benefit from membership" was also favorably assessed. Although users can read all the contents anonymously and without prior registration the actual step of becoming a member by generating a personal customer profile seems to be one of the key assets of the Web site. This is due to the personalization of the interface and the profile-based book recommendation (e.g. "instant recommendations"). Push (#8) and pull (#9) mechanisms are additional strong features (cf. Figure 3).

Push	E-Mail-Recommendation	
	"Instant Recommendation" "Book Matcher"	"Customer Buzz" "Mood Matcher" Recommendations Reviews/Ratings
Pull	Individualized	Browsing-Mode

Figure 3: Amazon.com Recommendation Center

Summarizing the results, the emerging picture shows that Amazon covers the information phase very well, does a good job in the agreement and settlement phase and provides unique community services which are valued by their customers.

## 4.2 Inter-firm Comparison

In order to identify general success factors, it will be necessary to look at Web sites that are actually yielding profits. For this reason, each assessor was asked to classify the Web sites according to the business for which it was designed. Profiles of less successful Electronic Commerce applications can then be compared against more profitable ones. The comparison of profiles and the thus identified differences may suggest important aspects for improvement.

The following section presents a comparison between the two Web sites of Amazon and Barnes & Noble. The bars in figure 4 indicate that both web sites follow a similar strategy for their community component. The key strength of Amazon comes in the form of the "Recommendation Center" the "Book Reviews" and the "Book Comments". These services might be a reason for why Amazon received higher values for almost all of the criteria.

### Amazon versus Barnes & Noble

Figure 4 lists the three transaction phases and the community component drawing a direct comparison between Amazon and Barnes & Noble. Barnes & Noble is the largest book retailer in the US. After an initially slow start on the Internet, the Web site tries to catch up with Amazon's. Early anecdotal evidence suggests that although the largest book retailer puts considerable resources in its online venture it has a hard time winning back business from its online rival.

The first observation when comparing the aggregated assessments of the two sites is the similarity of the results. Both sites seem to please or displease in about the same way. Both are doing a fairly good job in the information phase with the exception of the criteria #5 “combination possibility”. Barnes & Noble, however, ranks lower for criteria #3 “information quantity” and #4 “customer profile.”

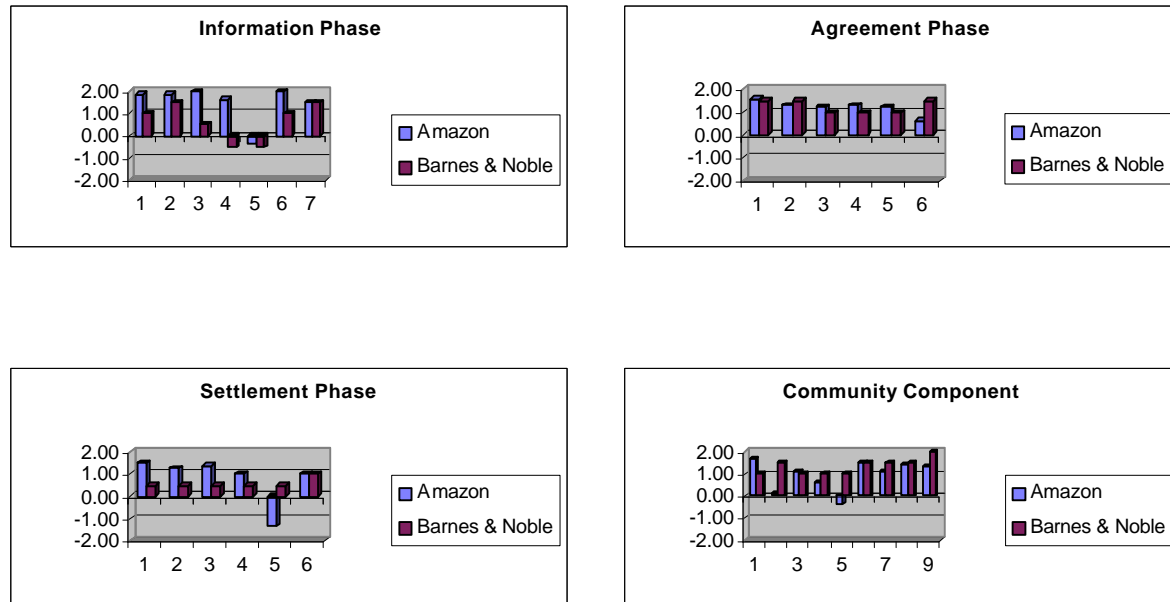


Figure 4: Inter-business comparison Amazon versus Barnes & Noble

Both companies put an emphasis on services in the information and the community phase. They are obviously not interested in bundling their products with external partners and they focus on low prices. In the beginning of Barnes & Noble’s online business, their community approach was different from how it is today. Amazon always made use of an open-community approach where everybody has access to all information. On the Barnes & Noble site users first had to contribute to the system before access to the community area was granted. The higher number of members reflects that the Amazon approach is the more successful way of establishing a long-term relationship with the customer. Meanwhile all big booksellers (e.g. also Borders Books and BOL) have almost identical strategies for personalization and community building.

Amazon offers more additional information than Barnes & Noble. This becomes apparent in the number of stored book comments. A sample taken in March 1999 for 3 popular books from the categories “Computer, Business and Fiction” showed results of 41, 18, 78 for Amazon and 1, 1, 2 for the Barnes & Noble Web sites. Amazon has more customers who actually contribute contents than Barnes & Noble and thus of a broader scope of information. The same applies to collaborative filtering because their basis of preference and interaction profiles is more compound. The resulting high benefits from membership are directly correlated with these advantages.

The findings of the comparison suggest that “number of members” and “collaborative filtering” have a positive effect on the perceived customer benefits and could thus be seen as the two most important criteria for online bookstores.

### 4.3 Overall Appraisal

The Internet makes it easier and much cheaper for people to get in touch with a company. The easier the interaction, the more likely it is for people to interact on the Web site. This establishes a closer bond with the customer than at any given time before. It is fair to claim that in the online world services eclipse products and that effectively and successfully managing the customer relationship is more important than profit margins. As it is fairly easy and cheap for everyone to copy best practice Web sites and the features they offer, it becomes vital to create a solid relationship with customers beyond the initial contact. Successful players will become, in effect, a sort of portal owners similar to Amazon in books, eBay in auctions, and Charles Schwab in finance.

However, few business-to-consumer websites are profitable today, and even high profile sites like Amazon do not expect to turn profitable soon. Some of the auction sites report profits, albeit at very low levels. Business-to-business Web sites are a possible area to look for future avenues for research in Web Assessment on how to build a successful online business. Companies such as Dell and Cisco create turnovers of billions of dollars on their Web sites.

The assessments suggest that the information phase is generally better implemented than the other phases which is hardly a surprise. The Internet is basically an information medium. Most companies, when undertaking the first steps in the new medium, try to basically leverage the advantage of the new medium. Only gradually, albeit quickly, the Web converts into a platform for buying and selling, finally maturing into an open electronic market. The initial euphoria about the friction-free economy has given way to a more reflected picture that recognizes the difficulties of implementing an online store that ultimately delivers a physical product to real people.

In order to identify general success factors it will be necessary to look at Web sites which are actually yielding profits. Profitable Web sites can offer best practice profiles. Providers of less successful Electronic Commerce applications can then be compared against the profitable ones. The comparison of profiles and the thus identified differences may suggest important aspects for improvement.

## 5 Further Research and Conclusions

The WA model proposes a comprehensive method for evaluating websites. We presented the theoretical background of our empirical study, followed by a detailed description of the Web Assessment Criteria, which especially consider the specific media characteristics of the Internet. The discussion of the results focuses on one special venue of online commerce, namely on bookstores. These advanced retail sites in both segments make good use of media-inherent features. Especially the information phase and the agreement phase are well covered by the offerings of the websites that were analyzed. This is no surprise since it reflects the development of Internet Commerce where companies typically started to transform their paper-based product catalogs into the new medium and are now adding interactive elements.

However, although generally acknowledged to be important, the solutions implemented to cover the community component and to a lesser extent the settlement phase leave still much room for improvement. Generic service integration in the settlement phase and personalization features, as part of the community component, will require most attention of Web site developers in the near future. The Web

sites in each respective category which handle these issues best will derive a substantial competitive advantage.

The paper deliberately limits the analysis to business-to-consumer cases with a standpoint close to the customer. To further validate the proposed framework and to assess electronic commerce applications, the model needs to be applied to subsequent retail sites, but even more to business-to-business cases, since Internet pundits expect this to be the major growth area in electronic commerce in the years to come. The ongoing Web Assessment Project will produce a set of reference cases allowing the build-up of a benchmarking database in order to derive best business practices. Furthermore, the model will be extended to accommodate the company's internal perspective and its cross-company information systems links (intranets, extranets).

In addition, the evaluation of consumer Web sites is similar in many respects to the evaluation of consumer advertising, e.g. in television or in print media. Further work is indicated to match the best practices of relevant marketing literature to the assessment of the new Web media that we have presented.

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## Appendix – Website Addresses

Amazon	<a href="http://www.amazon.com">www.amazon.com</a>
Barnes & Noble	<a href="http://www.barnesandnoble.com">www.barnesandnoble.com</a>
Borders	<a href="http://www.borders.com">www.borders.com</a>
Business Media	<a href="http://www.businessmedia.org">www.businessmedia.org</a>
CCEM	<a href="http://www.businessmedia.org/businessmedia/businessmedia.nsf/pages/ccem4_main.html">www.businessmedia.org/businessmedia/businessmedia.nsf/pages/ccem4_main.html</a>
Charles Schwab	<a href="http://www.schwab.com">www.schwab.com</a>
eBay	<a href="http://www.ebay.com">www.ebay.com</a>
Fnac	<a href="http://www.fnac.fr">www.fnac.fr</a>
Lotus Domino	<a href="http://www.notes.com">www.notes.com</a>
MCM Institute	<a href="http://www.mcm.unisg.ch">www.mcm.unisg.ch</a>
NetAcademy	<a href="http://www.netacademy.org">www.netacademy.org</a>
Web Assessment website	<a href="http://www.businessmedia.org/businessmedia/businessmedia.nsf/pages/wa_main.html">www.businessmedia.org/businessmedia/businessmedia.nsf/pages/wa_main.html</a>
Yahoo	<a href="http://www.yahoo.com">www.yahoo.com</a>

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