

## **Web Site Evaluation: Do Web Applications Meet User Expectations? Music, Consumer Goods and e-Banking on the Test Bed**

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### **Abstract**

*The paper presents an analysis of twelve commercial Web sites in three different business sectors: music, consumer goods, and e-banking. The Web sites were assessed using the Extended Web Assessment Method, an evaluation tool which has been specifically created for the assessment of e-commerce applications. The findings show that most Web sites are far from fully meeting user expectations. Interestingly, the lessons learned are quite different for each sector. Music selling Web sites should have an easy job in meeting customer requirements because they can deliver their products directly over the Internet. Nevertheless, the download of mp3 files from US-based companies onto a Swiss computer seemed to be a big problem. Consumer goods are a local business. Despite of this possible disadvantage they showed the best performance in satisfying their customers. E-banking applications do not present differentiated features, one can seemingly be replaced by the other with no problem.*

### **1. Introduction**

The paper presents the findings of an empirical study carried out in January 2001. As indicated in the title, we focused our analysis on three different business sectors: music, consumer goods and e-banking. The assessment forms were completed by 30 Internet-experienced graduate students who attended an E-Business class, and who were thoroughly instructed in the use of the tool beforehand. Since the study was conducted in Switzerland, the results represent a Swiss perspective. E-business is still a very regional affair, making it hard for consumers to assess Web sites in

countries other than their home country. Nevertheless, we included some German and US companies in our sample to make the study more interesting and to add an international perspective in a study about the inherently global Internet commerce environment.

Only Web sites which were intensively used or tested by the assessors were investigated. Accordingly, the sample represents a small quantity of highly-qualified user opinions. The evaluations resulted into Web assessment reports which compare the individual performance profile of three companies with the “best of its class” (best practice profile) and the general sector profile (aggregation of all companies in the same sector).

The paper starts with a description of the methodology of the Web Assessment explaining its origins and the latest adjustment to advances in technology and Web site design. We then describe our study and the way in which we prepared the results. Four companies from each sector (music, consumer goods, and e-banking) are briefly introduced and the findings for the sector are discussed in detail. The paper concludes with some remarks about the current state-of-the-art in Web sites design and functionality and their suitability for e-commerce transactions.

## **2. Methodology**

The methodology used for this study is based on the Extended Web Assessment Method (EWAM). This method has its origins in the original Web Assessment (WA) method developed in St. Gallen, Switzerland in the early 1997th. In recent months it was adjusted to latest technological developments. The following paragraph gives a brief description of the EWAM principles.

### **2.1 The Original Web Assessment Method (Selz/Schubert 1998; Schubert/Selz 1999, 2001)**

The Web Assessment Method was developed in 1997 at the Competence Centre for Electronic Markets (CCEM) at the University of St. Gallen in conjunction with the company partners. The original impulse arose from the discontent felt by industrial partners of the CCEM about unsatisfactory results of e-commerce applications already carried out. The method defines an evaluation grid with a set of criteria to appraise the quality and success of existing e-commerce applications. Besides the rigorous focusing on consumer perspectives, the success in implementing the offer of products and services is considered with reference to the specific features of the electronic medium. Successful Internet business activity requires the following new paradigms to be taken into account:

*Electronic markets and transaction phases:*

The Web Assessment Model examines the three classic transaction phases of electronic markets (information, agreement and settlement). A fourth element, the ‘community component’, is integrated as a link between the actual purchase transaction and the necessary trust relationship in the virtual realm.

*Information technology / Media-inherent Characteristics:*

Where marketing aspects are concerned, the Web Assessment model focuses on the special features that are inherent in the Internet. The assessment criteria are, besides the transaction phases and community component, derived from the characteristics of the electronic medium: hypermedia presentation, database interface (expert system), 24-hour access, anonymity, ubiquity, configuration possibility of the user surface, integration with the customer and asynchronous communication.

*Performance marketing:*

The underlying idea of performance marketing is that the client should not only be sold the core product, but should additionally be offered a range of complementary products to maximise customer need. These additional services customise the product and make it attractive for the client. In the difficult arena of international competition product differentiation is thus made possible.

From the technological point of view, the Internet could be the most appropriate approximation to a perfect, frictionless market and the price-negotiating mechanisms available within it. Ubiquitous access to information enables the buyer to compare offers worldwide and quickly. In any analysis the price factor must therefore be consistently borne in mind.

The original Web Assessment Method represents a step towards the all-embracing evaluation of existing e-commerce applications from the customer's point of view. As a result of technological progress and the accompanying value change among users since the development of this method, it was thought necessary to adapt the questionnaire for the purpose of data collection and identification of success criteria. In summer 2000 the method was fundamentally revised; besides taking account of new research findings - especially in the Internet marketing field - it also incorporated the Technology Acceptance Model (TAM) [Davis 1985], established for the acceptance of information systems, which incorporates important social factors of user behavior. For an extended explanation of the new, revised method see Giger/Schubert/Dettling 2001. Besides the fundamentals of the TAM some alternative approaches of Web site evaluation were taken into account during the revision of the Web Assessment Method:

- Expectations & Rankings of Website Quality Features: Results of 2 Studies on User Perceptions [Zhang/von Dran 2001]
- Design Quality of Websites for Electronic Commerce: Fortune 1000 Webmaster's Evaluations [Liu/Arnett 2000]
- The Impact of Perceived Website Characteristics on Website Traffic [Van der Heiden 2000]
- Perfekte Webseiten – wie sieht die Realität aus? [Kamenz 2000, 21-33]
- Web Usage Mining for Web Site Evaluation [Spiliopoulou 2000, 127-134]
- Konzepte und Vorgehensmodelle für die Web-Evaluation [Klein 1998]
- GomezPro.com [Gomez Advisors, Inc. 2000]

- Certified E-Shop – Das Prüfsiegel für Online-Shops [TÜV Secure iT GmbH 2000]
- JurisNET [JurisNET GmbH 2000]

## **2.2 Extended Web Assessment Method (EWAM)**

As already explained, the Extended Web Assessment Method builds on the Web Assessment Method and integrates findings from the Technology Acceptance Model and several alternative approaches. It defines an evaluation grid including a set of criteria to appraise the quality and success of existing e-commerce applications, which will be presented below. The focus lies on consumer perspectives and the specific features of the Internet as medium.

A successful e-commerce application must meet the needs of the user according to 'Perceived Usefulness' (Criteria USEF1-USEF15) and 'Ease of Use' (Criteria EOU1-EOU8). Under the headword 'Trust' (Criteria TRUST1 - TRUST2) questions about the 'Subjective Norm' are additionally taken into account. A success or quality feature must be assigned to one of these categories.

When evaluating an e-commerce application according to the Extended Web Assessment Method a Web site is first of all allocated to a sector. This serves later during evaluation to identify the reference sector for benchmarking. The success and quality criteria are formulated in general terms and are valid in every sector, but are differentiated by their importance rating. In order to take due account of the differences in the individual sectors, criteria are weighted corresponding to different sector profiles and their relevance in the sector. Hence being up to date with information is of greater importance for the supplier of financial information (e.g. Stock Brokerage, real-time share prices) than for a supplier of consumer goods. With the distribution of digital goods (e.g. software) the choice of generic services (EOU5), for example, tracing and tracking of a parcel, is of lesser importance than with the delivery of a book. In order to be able to undertake specific and high-quality analyses, it is essential to record the level of importance per criterion and per sector exactly. The importance per criterion is recorded on a scale from 'unimportant' (-2) through 'less important' (-1), 'important' (+1) to 'very important' (+2).

The purpose of digital marketing is to create tailor-made, individual packages for each single customer and build up personal one-to-one relations, instead of, as in conventional marketing methods, making an offer of the lowest common denominator to a great mass of anonymous customers. Aspects of customisation are therefore included in a large number of criteria. To personalise an offer, the customer must release personal details (e.g. family name, first name, address, e-mail, credit card number, preferences and interests, navigational behavior, etc). Inducing a customer to give personal information about themselves presupposes a high degree of trust in the supplier.

Trust is the *sine qua non* of e-commerce; without trust no business is done. The creation of a trustworthy environment on the Internet is a major challenge for the

success of e-commerce. According to the 'Theory of Reasoned Action' [Fishbein & Ajzen 1975] Subjective Norm refers to how an individual is influenced by a person particularly close to them, and by this person's opinion of a certain way of behaving. Derived from this a link can be drawn between e-commerce and trust; in the virtual world of the Web buyers and vendors face each other, anonymous and alienated. Through the absence of face-to-face communication traditional business rules are partially invalidated. Purchasing on the Net is still considered insecure, so that public opinion has a negative influence on potential buyers. If a Web site does not succeed in creating an atmosphere of trust, the online buyer is inhibited from doing business on the Net.

Every Web offer is directed at a specific target group. Thus, for instance, [www.wechselstube.ch](http://www.wechselstube.ch) is directed at SMEs which want better exchange rates for small currency transactions within a customer community. When evaluating such a Web offer or when raising the importance of the criteria in this sector (e.g. Stock Brokerage) one has to take care that the assessors also come from this target group. They alone are qualified to estimate the relevance of the criteria and the quality of the Web site. The importance of this aspect increases with the concentration of an offer on a specific theme. For this reason only assessors who themselves effectively know and use the assessed Web application should be considered.

### **2.3 Summary of the Methodology**

An EWAM criterion is first of all assigned to a criteria category (Ease of Use, Usefulness or Trust) and within these three categories allotted to one of the four transaction phases of electronic markets (the information, agreement, settlement and after-sales phase), to the community component or to the category 'criteria which concern all phases'. Compared with the original Web Assessment Method, the EWAM was extended to include the after-sales phase and a category group 'criteria which concern all phases'.

*Figure 1* shows the combination of the Web Assessment Method with the 'Ease of Use' and 'Usefulness' categories of the 'Technology Acceptance Model' together with the 'Trust' category taken from the TRA. The 'sector 1 ..n' dimension illustrates the extension of EWAM with sector profiles and the consideration of differing importance of individual criteria within these sectors.

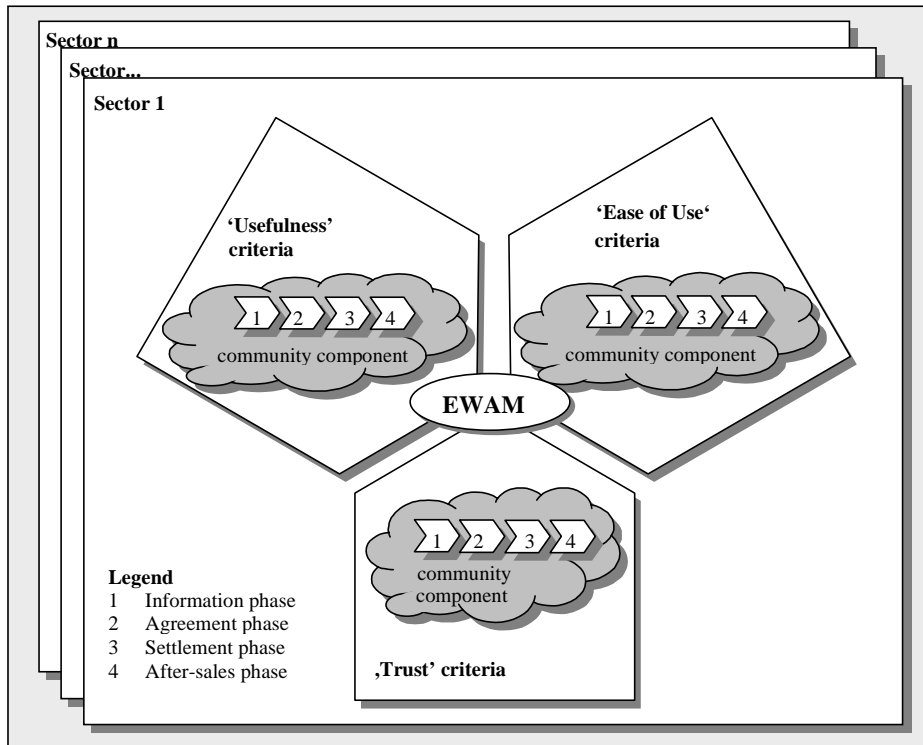


Figure 1: Diagram of the 'Extended Web Assessment Method'

### 3. Study

The study presented in this paper is the first conducted with the new evaluation tool based on the *Extended Web Assessment Method* (EWAM).

#### 3.1 Data Collection: the EWAM Tool

Data is collected over the Internet with an online questionnaire ('EWAM tool') in which the usual structure of the original tool [Selz/Schubert 1998] has been retained. The individual criteria have been assigned to a transaction phase or a community component, and two new sections have been added ('After-sales phase' and 'criteria which concern all phases').

When the assessor starts the evaluation with the EWAM tool, as a first step he must record the URL of the Web site under examination and assign it to a sector. The scale of the possible choices is so arranged that the assessor must decide on a positive or negative statement with each value. The scale has four values (++,+,-,--). The alternative value 'n.a.' (not applicable) can be used if a criterion is not relevant or not available in a particular context. The criteria are so formulated so that a positive (negative) evaluation will also lead to a positive (negative) result. 'I

strongly agree' always scores (+2), 'I slightly agree' (+1), 'I slightly disagree' (-1) and 'I strongly disagree' (-2). 'N.a' scores nil, which is disregarded with further calculations (e.g., of averages).

### 1. Information Phase

[-> explanation](#)

	ID	‡	+	,	!	n.a.
Web Page and Specific Offer are Easily Found	EOU1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Structure of Content	EOU2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasonable Information Quantity	EOU3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of Content Meets User Expectations	USEF1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost Benefits Passed on to the Client	USEF2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bundling: Good Combination Possibilities for Products/Services	USEF3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Recommendation Systems	USEF4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adequate Application of Hypermedia	USEF5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2: EWAM tool: list of information phase criteria

### 2. Agreement Phase

[-> explanation](#)

	ID	‡	+	,	!	n.a.
Transparent and Interactive Design of Ordering Process	EOU4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fair and Individual Prices	USEF6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3: EWAM tool: list of agreement phase criteria

### 3. Settlement Phase

[-> explanation](#)

	ID	‡	+	,	!	n.a.
Easy Selection and Good Integration of Generic Services	EOU5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Integration in Customer's IT-Infrastructure	USEF7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Tracing and Tracking	USEF8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 4: EWAM tool: list of settlement phase criteria

### 4. After-Sales

[-> explanation](#)

	ID	‡	+	,	!	n.a.
Convenient Customer Support	EOU6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Satisfying Customer Support	USEF9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 5: EWAM tool: list of after-sales phase criteria

## 5. Community Component

[-> explanation](#)

	ID	‡	+	,	!	n.a.
Good Access to Community	EOU7		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Quality & Quantity of Relationships in Community	USEF10		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Quality & Quantity of Content Generated by Community	USEF11		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purchasing Power	USEF12		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 6: EWAM tool: list of community component criteria

## 6. Final Section

[↑ Top of 'Evaluation Form'](#)

In the final section, you are asked to answer a last set of questions relevant for all of the above mentioned phases and give some personal information about your Internet experience.

	ID	‡	+	,	!	n.a.
Good Availability	EOU8		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good User Interface	EOU9		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improvement in Productivity / Time Gained	USEF13		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactivity	USEF14		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Contact Possibilities	USEF15		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy Business Partners	TRUST1		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust in Internet as Platform and Legal Situation	TRUST2		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 7: EWAM tool: list of final section criteria

### 3.2 Data Preparation and Analysis

For the drawing up of meaningful evaluations of any Web site under examination (the Web site compared to the sector average, to best practice profile or to a competitor of your choice) three profiles are defined in the EWAM.

- *Company Profile*: the profile of a single Web site
- *Sector Profile*: the aggregated profiles of the relevant sector
- *Best Practice Profile*: the profile of the best-of-breed in the relevant sector

The EWAM judges a Web site 'purely' from the customer's point of view. The best EWAM result does not necessarily mean that this Web site is the most successful in reality, since success is influenced by further factors (e.g. e-business relevance of the offer, profitability, backend integration, financing aspects, etc). A Best Practice Profile can only be established when (a) a sufficient number of different Internet businesses per sector have been evaluated and (b) these have been compared with their performance in the real world, in which case a best practice must also be effectively successful there. Accordingly an adequate best practice data reference base can only ensue from the combination of points (a) and (b).

### 3.3 Personal Web Assessment Report

After a Web site has been evaluated by an assessor, the assessor receives on request a Personal Web Assessment Report containing the following analyses and representing them graphically:

- a) Summary of the individual criteria and results in the categories '1. Information Phase', '2 Agreement Phase,' '3 Settlement Phase', '4 After-sales Phase', '5 Community Components', '6 Final Section' and a calculation of the total score.
- b) Comparison of the Web sites examined with the sector average and with the sector Best Practice, in the form of a quantitative and graphic analysis, taking no account of the importance rating of criteria.
- c) Graphic comparison of the results of the first six categories (a,b) with their importance rating for company and sector profile.
- d) Comparison as b) above, but taking full account of the importance rating of criteria.

We identified three different target groups which gain the following benefit from the personal Web assessment report:

- *Internet vendor*: Comparison of the quality of the customer orientation of its Web site with the sector profile or with a direct competitor. Possible suggestions for improvement drawn from the result.
- *Potential Internet vendor*: increasing awareness of the success criteria of commercial Web sites.
- *Internet buyers/users*: examination of the quality of the customer orientation of a Web site through which the customer buys online

Figure 8 to Figure 12 show part of a Personal Web Assessment Report for the Stock Brokerage sector, based on fictitious data. The strengths and weaknesses of a Web site, in one or several categories, are clearly visible.

Phase	Results (Range -2/+2)	Company Profile		Best Practice Profile (BPP)	Sector Profile (SCP)
		Difference to			
		BPP	SCP		
1. Information Phase	0,56	-0,98	-0,51	1,54	1,07
2. Agreement Phase	0,13	-1,38	-0,43	1,50	0,56
3. Settlement Phase	0,25	-0,97	-0,61	1,22	0,86
4. After-Sales Phase	0,88	-0,46	-0,29	1,33	1,17
5. Community Component	-1,42	-2,50	-1,54	1,08	0,13
6. Final Section	1,04	-0,58	-0,25	1,62	1,29
7. Overall Score	0,34	-1,10	-0,59	1,44	0,93

**Figure 8:** Valuation of results, without importance rating of criteria.

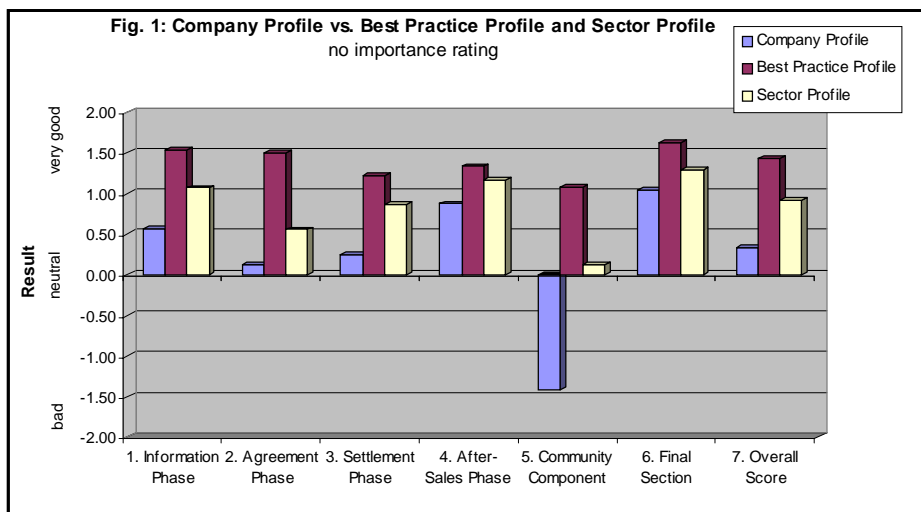


Figure 9: Graphic evaluation, without importance rating of criteria.

In a second step each criterion, independent of the respective sector profile, was given an importance rating from (-2) ('unimportant') to (+2) ('very important'). Zero (0) represents a neutral value.

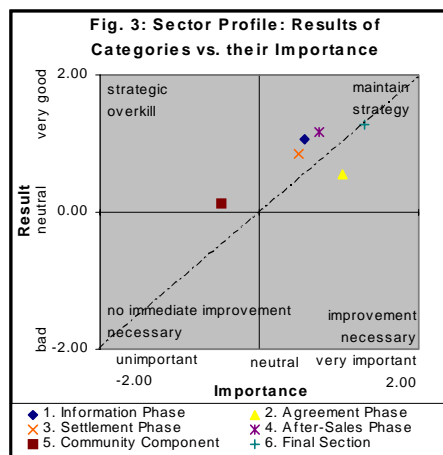
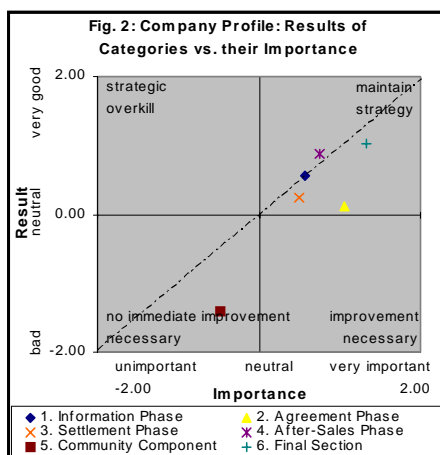


Figure 10: Comparison of results with importance rating

Figure 10 compares the results of the individual categories with their importance ratings for the company and sector profile. It shows two matrices, subdivided into four sections in which a result for any category should ideally lie on or above the

diagonal. The following boxes contain recommendations for strategies which should be applied dependent on the results in the various sections.

Strategy	Results
'Strategic Overkill'	Entries in the upper left field indicate (very) good results in a (rather) unimportant category. Available resources are possibly not being applied effectively.
'Maintain Strategy'	Entries in the upper right field indicate (very) good results in (very) important categories.
'No immediate improvement necessary'	Entries in the lower left field indicate (very) poor results in (rather) unimportant categories.
'Improvement necessary'	Entries in the lower right field indicate (very) poor results in (very) important categories.

In a last step the importance ratings per criterion are included in the Web site analysis. The top score for any criterion can only be reached when the rating is also top.

Phase	Results (Range -2/+2)	Importance	Company Profile		Best Practice Profile (BPP)	Sector Profile (SCP)	
			Difference to				
			BPP	SCP			
1. Information Phase		0.58	0.37	-1.09	-0.60	1.45	0.96
2. Agreement Phase		1.05	0.40	-1.22	-0.37	1.62	0.77
3. Settlement Phase		0.50	-0.01	-1.09	-0.76	1.08	0.74
4. After-Sales Phase		0.75	0.83	-0.38	-0.32	1.21	1.15
5. Community Component		-0.48	-1.40	-2.41	-1.50	1.01	0.10
6. Final Section		1.33	1.15	-0.56	-0.27	1.70	1.42
7. Overall Score		n.a.	0.47	-0.98	-0.54	1.45	1.02

**Figure 11:** Results of an evaluation, with importance rating of criteria.

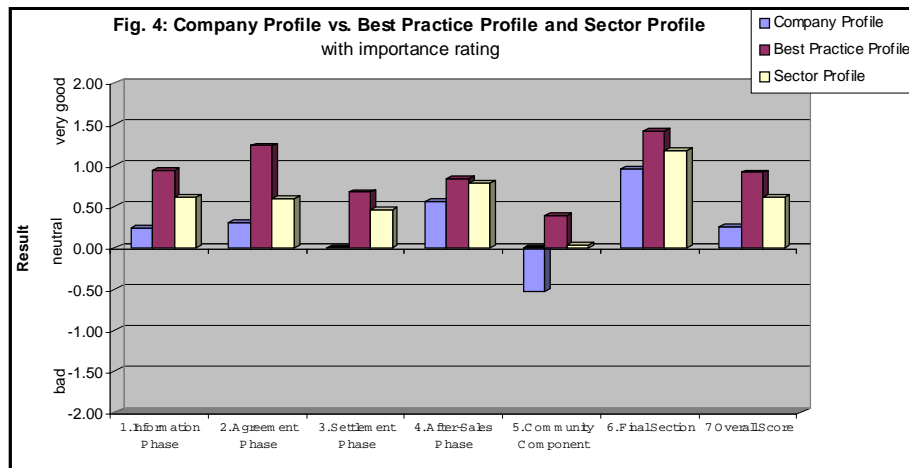


Figure 12: Graphic evaluation, with importance rating of criteria

Improvement strategies should be based on the company profiles which take importance ratings into consideration. It is not important for a company to score high in a category which is not important for its sector. For the explanation of the mathematical derivation, please refer to Giger/Schubert/Dettling 2001.

#### 4. Music, Consumer Goods and E-Banking

The following paragraphs present the findings for three different industries: music, consumer goods and e-banking. The Web sites chosen stem from Switzerland, Germany, and the USA. Our aim was to also study differences between the countries.

##### 4.1 Interpretation of the Assessment Forms

In order to be able to assess the Web sites we had to interview the assessors about their perceived importance ratings. As mentioned before, the “raw data” for a data set does not allow interpretation of the performance of a Web site. We distributed three general Web assessment forms to a selected set of people who are familiar with using the Web as a source of information and shopping. These people were asked to state their expectations for Web sites in the three different industries. Their forms were collected and the data was entered into the tool as the so-called “importance rating”. The importance rating shows the expectation of a user for a certain criterion. If expectations are high, meaning that a certain feature is important for a Web site from the user perspective, and cannot be found during the assessment the result will be a bad evaluation for the respective criterion. For the evaluation, the criteria are then summed up and aggregated to show only one value for a certain phase.

## 4.2 The Music Industry

Web sites assessed:

- <http://www.cdnow.com>
- <http://www.emusic.com> (\*\*\*)
- <http://www.mp3.com>
- <http://www.towerrecords.com>

The following table shows the aggregated values for the music industry. The column labelled “importance” shows the perceived user expectations. The possible range of values is +2 to -2. For the calculation, the importance values are later transferred to a scale of 0 to 1. The information phase is the most important followed by the final section. The final section contains general criteria which apply to all phases (availability, user interface, interactivity, trust). Surprisingly, the community component received a low importance rating. This could be due to the fact that the assessors do not yet know about the power of community building on the Internet and were thus not able to really judge the importance as e.g. pointed out by Schubert [2000]. On the other hand, they possibly focused on just getting the mp3-files downloaded on their machine thus underevaluating the process of finding the right music and being guided by information provided by other users.

Phase	Results (Range -2/+2)	Importance	Company Profile		Best Practice Profile (BPP)	Sector Profile (SCP)	
			Difference to				
			BPP	SCP			
1. Information Phase		0.96	0.31	-0.32	-0.16	0.63	0.47
2. Agreement Phase		0.67	0.46	-0.39	-0.05	0.85	0.51
3. Settlement Phase		-0.78	0.29	-0.02	0.04	0.31	0.25
4. After-Sales Phase		-0.67	0.00	-0.33	-0.15	0.33	0.15
5. Community Component		-0.67	0.33	0.33	0.31	0.00	0.03
6. Final Section		0.95	0.73	-0.07	0.10	0.81	0.63
7 Overall Score		n.a.	0.35	-0.13	0.02	0.49	0.34

**Figure 13:** Aggregated data set for the music industry, company profile: [www.cdnow.com](http://www.cdnow.com)

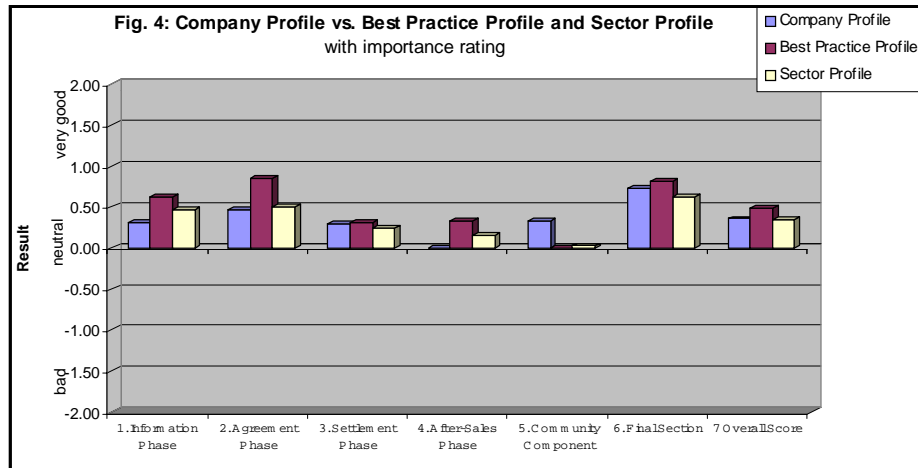


Figure 14: Company Profile of www.cdnow.com

Figure 14 shows the results for www.cdnow.com. The first column is the company profile, the second column the best practice profile (www.emusic.com), and the last column shows the average values of the sector as a whole. Figure 15 compares the assessment figures with the perceived user expectations. As we can read from the graphic www.cdnow.com scored *higher* than the expectations in the categories After-Sales, Settlement and Community. Interestingly, these were the categories which were deemed unimportant for the music-selling Web sites. The diagonal shows the points where expectations meet actual assessments. The final section, also important, lies exactly on this diagonal meaning that www.cdnow.com shows a good performance on availability, user interface and trust. The two other important categories, information and agreement, can be found in a lower area of the figure. The generic strategy for this sector is “improvement necessary”. The general advice for www.cdnow.com is to focus its future improvements on the information and agreement phase. The community component is situated in the “strategic overkill” zone. User expectations were extremely low for this category. The authors of this paper assume that the assessors underestimated the power of community building for the music industry and that www.cdnow.com is thus following a good strategy in offering community-building features.

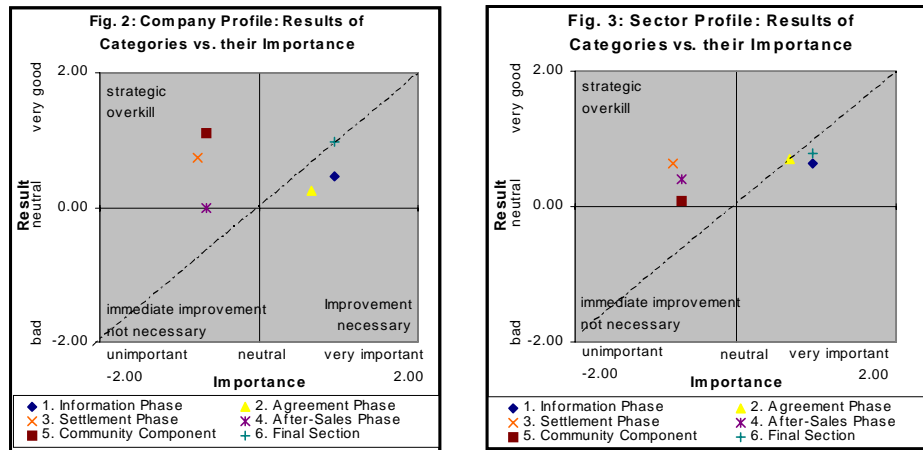


Figure 15: Suggested strategy for www.cdnw.com

The aggregated results for all three industries (sector profile) show values which are usually distributed along the diagonal. Single companies show deviations for certain specific points. The average of all values comes close to the user expectations which allows the general conclusion that most Web sites have strengths and weaknesses but are generally good enough to be used for their purpose.

### 4.3 Consumer Goods

Web sites assessed:

- <http://www.kaufhof.de>
- <http://www.le-shop.ch> (\*\*\*)
- <http://www.migros.ch>
- <http://www.peapod.com>

The companies which were chosen for the consumer goods sample are from three different countries. Kaufhof is a German brick-and-mortar department store which was one of the first in its sector to start a venture in the online world. Le-Shop is a pure and independent online business which acts as a reseller for food and drugs. Acting solely on the Internet it is not surprising that it was voted “best of its class”. Migros is a Swiss store selling all kinds of consumer goods with a focus on the food sector. Peapod, finally, is an American “Internet grocer”. Founded in 1989 it is one of the oldest of its kind.

For the presentation of our results we picked [www.migros.ch](http://www.migros.ch). Since our Swiss assessors were not able to order neither from Kaufhof nor from Peapod (both do not deliver to foreign countries) we could not get high-quality figures for the agreement and settlement phase for those countries. Migros and Le-Shop were “truly” assessed

and most of the assessors remarked that they would use one of the two shops more often from now on.

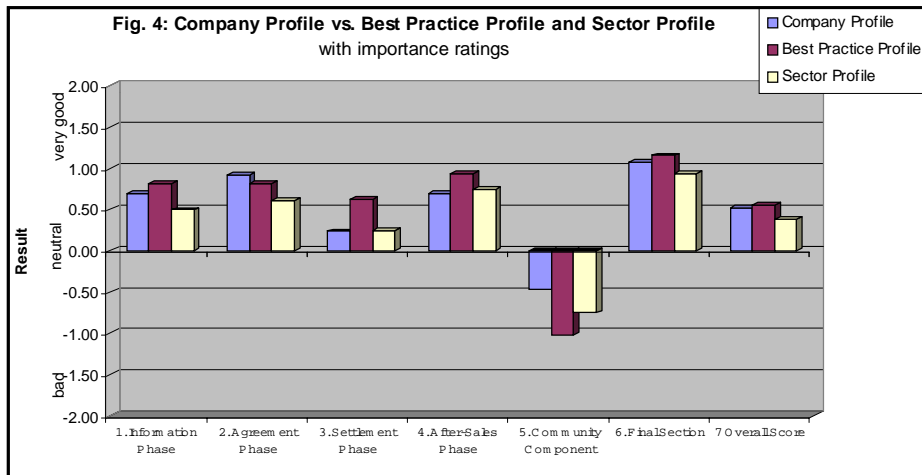


Figure 16: Company Profile of www.migros.ch

The assessors found the final phase (1.43) and the after-sales phase (0.83) to be the most important categories for the consumer goods sector. As illustrated in **Figure 16** Le-Shop (best practice profile) performs better than Migros in both categories. As seen before, the community phase (0.17) was not judged to be important. This is not surprising for consumer goods since they do not bare such a great potential as do products which relate to leisure time or special interests (e.g. DVD videos or chess) [Schubert et al. 2001].

#### 4.4 Electronic Banking

Web sites assessed:

- <http://www.bekb.ch>
- <http://www.deutsche-bank-24.de/>
- <http://www.ubs.ch> (\*\*\*)
- <http://www.zkb.ch>

The Berner Kantonalbank ([www.bekb.ch](http://www.bekb.ch)) is a small Swiss regional savings bank which, nevertheless, offers a comprehensive e-banking application. Bank-24 is the online venture of Deutsche Bank, the biggest bank in “Euroland”. It was the first purely Internet-based bank in Germany. Deutsche Bank has a proactive Internet strategy – they were the only bank to launch a project with Ecash which so far has

not really taken off (and probably never will since new and better payment systems are already on the market).

The e-banking sector resulted to be the most difficult to assess. Since most of our assessors did at most already use one of the selected e-banking services (who has more than one bank account?) they had to rely on the demo version which are offered by all four sites. UBS was chosen to be best of its class in this sample. UBS is the biggest Swiss bank with a large customer base, presumably some also among the assessors. A general conclusion of the Web assessment is that the better the assessors know a company and its services the more they tend to give good marks. This might have happened in the UBS case. Nevertheless, the results clearly state that the four Web applications are very similar to each other in terms of functionality, look and feel, contact possibilities, and so on. **Figure 18** shows the results for Credit Suisse as compared to UBS (best practice profile) and the general sector profile (aggregated values of all four banks). The columns suggest that differences are almost negligible. What catches the eye are the almost zero values for the community category. Neither did the assessors attribute great importance to community (-1.75) nor did they report any kind of community-supporting components on the four Web sites. Interestingly, the after-sales phase seems to be of high interest. This is where the interaction between company and customer often relates back to the “real world”, namely to the telephone. Most after-sales services, such as the handling of complaints, are not processed via the Internet.

Phase	Results (Range -2/+2)	Importance	Company Profile		Best Practice Profile (BPP)	Sector Profile (SCP)
			Difference to			
			BPP	SCP		
1. Information Phase	0.13	0.59	0.00	0.18	0.59	0.41
2. Agreement Phase	0.17	0.35	-0.07	-0.06	0.43	0.41
3. Settlement Phase	0.44	0.57	-0.13	0.16	0.70	0.41
4. After-Sales Phase	2.00	0.99	0.19	0.08	0.80	0.91
5. Community Component	-1.75	-0.05	-0.07	-0.03	0.02	-0.02
6. Final Section	1.62	1.28	0.04	0.20	1.24	1.08
7 Overall Score	n.a.	0.62	-0.01	0.09	0.63	0.53

**Figure 17:** Importance for the e-banking sector

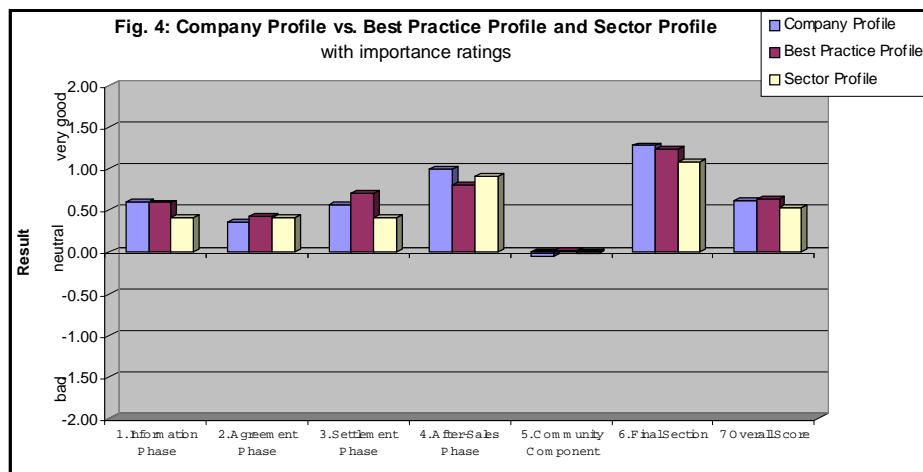


Figure 18: Company Profile of *www.cs.ch*

## 5. Discussion of Findings

Web assessment is a very ambitious and labour-intensive work. The assessors have to meet certain criteria:

- They need to understand the criteria of the Web assessment form very well, hence they must undergo a thorough instruction
- They must be experienced Web users
- They must take the time to go through all four transaction phases for each Web sites assessed (including delivery and payment!)

The three sectors which we put to the test were not equally well-suited to be assessed with the tool. The Web assessment method is based on the four transaction phases of a typical purchase. Thus, e-banking is difficult to test with the existing categories. Nevertheless, we still think that it is possible to evaluate almost any kind of Web site since most of the criteria refer to Web site functionality and not purely to the process.

The e-banking sector shows homogeneous Web applications which do not differentiate themselves from the competition. This is not surprising since banking applications are quite generic and involve little personal involvement on the part of the user.

Music, on the other hand, is often said to be a perfect good to be sold on the Web. The songs in mp3 format can be directly delivered via the Internet. Nevertheless, the results show that the Web sites still need a lot of improvement to make the shopping experience really pleasant. All four sites were blamed for a bad user guidance. An example would be the need to enter a ZIP code as a first step; something that totally fences off European or better said non-US customers. In some cases it was not possible to download mp3 files for technical or regional (we

do not “deliver” to Switzerland) reasons. Questions which relate to the area of e-government, e.g. tax restrictions, are still a global hindrance to electronic commerce (cf. tax problems as discussed in Uzuner/McKnight 2001). Additionally, prices for single mp3 songs are (too?) high.

The consumer goods business is a local business – even on the Internet. This is quite evident because of the nature of the products (have to be physically delivered, are prone to spoil or break). It is even more surprising, that the Web sites selling consumer goods seemed to be the most mature ones. Their services were found to be quite reliable, the problem of co-operation with logistics partners has been solved satisfactorily. Some complaints were the limited range of products (e.g. frozen food is not available) or the missing link to the inventory (availability check). Some orders arrived with missing items because they had been out of stock at the time when the package was prepared.

Generally, it seems that few Internet merchants have ever tried to assess their Web sites from a consumer perspective. Most are still driven by technical possibilities. It is noticeable that there is a missing link to “traditional” information systems, e.g. an existing ERP, which could help to perform an availability check which is crucial to an online transaction. Most systems seem to be stand-alone Web applications. This can be either due to the consideration of security (a bad reason from the customer perspective) or due to the high costs of an integration of the different systems. A real “global e-commerce” does not exist in the three sectors which we assessed.

## **6. Conclusions**

EWAM lays down a conceptual framework for the evaluation of commercial Web sites whose basic form - the Web Assessment Method - has already proved itself in operation for several years. Websites can thereby be thoroughly appraised and implicitly the degree of customer orientation can be judged.

The assessment sample presented in this paper is only a first step. Further research and development work is needed in order to gather a quantitatively and qualitatively sufficient database for different sectors. The importance of each individual criterion per sector must be recorded and existing Web sites must be evaluated. Together with a sufficient database and knowledge about commercial Web sites which have proved successful in practice, the best practice profiles for each sector can be derived.

With the EWAM, the focus is fixed exclusively on the customer's perspective in the B2C field. Further success factors such as the integration of the supply chain, the linkage of in-house information systems or the consideration of financing and yield aspects are excluded from the present version. The result of the combination of these aspects would be an all-embracing model for the evaluation of integrated e-business solutions in companies.

## References

- Davis, Fred D. Jr. (1985): A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results. Doctoral Thesis, Sloan School of Management, Massachusetts Institute of Technology, 1985.
- Fishbein, M.; Ajzen, I (1975): *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Reading, MA: Addison-Wesley, 1975.
- Giger, Adrian; Schubert, Petra; Dettling, Walter (2001): Extended Web Assessment Method (EWAM): Evaluation of E-Commerce Applications from the Customer's Viewpoint, in: Paper Proposal currently under review.
- Gomez Advisors, Inc. (2000): [<http://www.gomezpro.com/index.asp>], [accessed 16.08.2000].
- JurisNET GmbH (2000): JurisNET-Gütesiegel, [<http://www.jurisnet.ch>], [accessed 10.08.2000].
- Kamenz, Uwe (2000): Perfekte Webseiten - wie sieht die Realität aus, in: Pförsch, Waldemar A. (Ed.), *Living Web: Erprobte Anwendungen, Strategien und zukünftige Entwicklungen im Internet*, pp. 21-33, Landsberg: verlag moderne industrie, 2000.
- Klein, Stefan (1998): *Konzepte und Vorgehensmodelle für die Web-Evaluation*.
- Liu, Chang; Arnett, Kirk, P.; Litecky, Chuck (2000): Design Quality of Websites for Electronic Commerce: Fortune 1000 Webmaster's Evaluations, in: *The International Journal of Electronic Commerce & Business Media*, Vol. 10. No. 2, pp. 120-129.
- Schubert, Petra (2000): *Virtuelle Transaktionsgemeinschaften im Electronic Commerce – Management, Marketing und Soziale Umwelt*, Lohmar, Köln: Josef Eul Verlag, 2000.
- Schubert, Petra; Selz, Dorian (1999): Web Assessment - Measuring the Effectiveness of Electronic Commerce Sites Going Beyond Traditional Marketing Paradigms, in: *Proceedings of the 32nd HICSS Conference, Hawaii, Internet and the Digital Economy Track*, Jan. 1999.
- Schubert, Petra; Selz, Dorian (2001): Measuring the effectiveness of e-commerce Web sites, in: Barnes, Stuart; Hunt, Brian (eds.), *E-Commerce and V-Business: Business Models for Global Success*, p. 83-102, Oxford: Butterworth-Heinemann, 2001.
- Schubert, Petra; Selz, Dorian; Haertsch, Patrick (2001): *Digital erfolgreich: Fallstudien zu strategischen E-Business-Konzepten*, Berlin, Heidelberg: Springer, 2001.

- Selz, Dorian; Schubert, Petra (1998): Web Assessment - A Model for the Evaluation and Assessment of successful Electronic Commerce Applications, in: Proceedings of the 31st HICSS Conference, Hawaii, Internet and the Digital Economy Track, Vol. IV, 1998, pp. 222-231.
- Spiliopoulou, Myra (2000): Web Usage Mining for Web site Evaluation, in: Communications of the ACM, August 2000, Vol. 43, No. 8, pp. 127-134.
- Uzuner, Ozlem; McKnight, Lee (2001): Sales Taxes on the Internet: When and How to Tax?, in: Proceedings of the 34th HICSS Conference, Hawaii, 2001.
- Van der Heijden, Hans (2000): The Impact of Perceived Website Characteristics on Website Traffic, in: Proceedings of the 13th International Bled Electronic Commerce Conference, Bled, Slovenia, 2000.
- Zhang, P.; von Dran, G. M. (2001): Expectations and Rankings of Website Quality Features: Results of Two Studies on User Perceptions, in: Proceedings of the 34th HICSS Conference, Hawaii, 2001.