

# Web Assessment – A Model for the Evaluation and the Assessment of successful Electronic Commerce Applications

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## Abstract

*Today many a Website features fancy graphics, well organized content, but rarely induces the visitor to come back on a regular basis (with exceptions of course). The electronic commerce revolution some predicted experiences a setback due to a lack of consumer interest and some potential customers turn their screens off rather than meddling their way through a purchase order. But why are customers so indifferent?*

*This paper addresses a largely unexplored issue: the analysis of supposedly interactive electronic commerce applications. The paper defines the theoretical framework of the Web Assessment Model. The model builds on the three transaction phases – information, agreement, and settlement – and parts of a product performance system. To embrace the notion of community – a central issue in virtual environments – a further phase is added, and media inherent criteria are derived. The paper closes by applying the model to the Web site of Swissair, the national airline of Switzerland.*

## 1. Introduction

One of the most profound consequences of the ongoing information revolution is its influence on how economic value is created and extracted. The new information infrastructure redefines the relationships between buyer, seller, and middleman, allowing new ways of accessing and tapping information, and price arrangements. Most importantly the information about a product or service may be separated from the product or service itself.

Consider how most books are sold today. Most of the books are sold in bookstores all around the country. Most of them have quite many books on hold, but need to order

special books from the wholesaler. When Jeff Bezos of Amazon.com set up his online bookstore in Seattle in 1995 [[22], [23]], he saw an opportunity to change the marketplace. He created a virtual bookstore, holding more than 2.5 mil. titles, about ten times as many as even the biggest bookstore in the physical world. Amazon itself keeps only the top-selling 400 or so titles in stock. Most of the others it orders from a nearby warehouse of a large distributor. More obscure books are ordered directly from the publishers. For best-sellers, Amazon charges 40% below list price; for nearly everything else, at least a 10% applies. Amazon finds it easy to match or beat the discounts of most conventional booksellers, sometimes even when shipping costs are included. Result: sales of \$16 mil. last year, and a profound impact on the distribution channel of books.

But once someone has shown the way it is easy for competitors to set up their own database and start selling books. To maintain a competitive advantage Amazon relies on customer loyalty that goes beyond the thrill to find the best bargain in the market. It offers its readers a service: information about books. The company collected reviews from various sources: authors submit their own interviews, reviews from literature magazines are added, and readers are invited to contribute their own reviews. The more books you buy and the more reviews you contribute, the better the automatic filtering software will be at finding books that you might like. Amazon created a loyal customer base.

Amazon is a successful example of a firm taking full advantage of the emerging online marketplace [[31]]. But most of the early World Wide Web entrance strategies have been rather driven by the inclination of an early adopters' strategy "*it is participation that counts*" [[29]], than a sound business model for electronic commerce (EC). Thus many companies and institutions discovered with surprise, that the comparatively modest budgets allocated

to the development of their Web sites did not always guarantee success. The initial euphoria is now declining, giving way to a certain disappointment of information suppliers and customers alike [[7]], and leading some potential customers to turn their screens off rather than meddling their way through a purchase order. But what precisely made Amazon.com more successful than its competitors'?

## 2. Purpose, Methodology, and Structure of the Paper

### Purpose

The original reason for the research was triggered by a request of our industrial partners when they used the Web as research tool and business medium<sup>1</sup>. Many sites feature fancy graphics, well organized content, but rarely a site induces the visitor to come back on a regular basis (with exceptions of course). The electronic commerce revolution some predicted [e.g. [32], more cautious [12], [6]] experiences a setback due to a lack of consumer interest.

This paper addresses therefore a largely unexplored issue: the analysis of supposedly interactive electronic commerce applications [[28]]. Some early initiatives pointing in the same direction are CommerceNet's [4] "Very Innovative Practice Awards for 1996", a quiz like questionnaire on a company's electronic commerce approach by Computerworld magazine [[5]], and efforts by Wilsonweb [[34]]. The paper reports initial results of a study carried out in cooperation with industrial partners of our research center that aims at identifying the success factors of electronic commerce applications.

### Research Methodology

The framework to develop the model has been established over the past years, focusing the research of the Competence Center on the strategic potentials of electronic commerce. The Web Assessment Model was studied in a series of seminars with our industrial partners, with the academic side proposing an initial set of ideas and criteria and the industrial partners commenting and reporting on experiences made with their respective sites

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<sup>1</sup> Since 1989 the Competence Center for Electronic Markets has been carrying out research on electronic commerce and electronic markets. The Center is part of the Institute for Information Management Institute at the University of St.Gallen, Switzerland. In cooperation with our industrial partners (AGI, Ernst&Young, Daimler-Benz, Danzas, Swiss Bank Corporation, Swiss Life Insurance, Swiss Telecom, Swiss Post) we focus on the strategic potentials of electronic commerce. For further information visit our Website (<http://www.businessmedia.net>). We are particularly indebted to Swissair for providing the data for the this case.

(from the initial design and implementation process, to the daily operation of a site and the results when applying early version of the model). Several iterations led to a first model that was then tested on two cases. The first site was the Web-based ordering system of a large automotive spare parts distributor, the second being an online mall with a sophisticated customer profiling system (both sites are not associated with our partners). The tested model was then put to use, assessing a major Web site of an industrial partner.

### Structure of the Paper

The rest of the paper is organized as follows: The second section briefly outlines the development of Web sites in the past couple of years to pinpoint the reasons that lead to the current impasse felt by many. It continues to define the theoretical framework of the Web Assessment Model, built around the three transaction phases and based on parts of a performance system. Section three applies the model to the case of the Web site of Swissair, the national airline of Switzerland. In closing we describe further research issues and add some concluding remarks.

## 3. Theoretical Background

### 3.1. The First Steps in a New Medium

Not long ago a corporate Web site was about as uncommon as a snow storm in summer. Back in 1993 nearly nobody talked about the Web except the universities that were making academic information available. Then in 1994 the Web lost a fair bit of its tag as a nerd medium and moved mainstream helped by developments such as the introduction of easy private Internet access and better user interfaces [e.g. [17], [14]]. Newsweek magazine [[19]] declared the year 1996 as the year of the Internet and since then we have seen an exponentially increasing amount of new sites. By the end of last year 80% of America's Fortune 500 firms had a Web site, compared with only 34% a year earlier [[7]].

The hype surrounding the Internet led many to believe in seemingly unlimited opportunities on the Net. The electronic commerce revolution was a matter of technical problems to be solved. Later one found out that the technical hurdles remain high [e.g. reliable payment systems, [36]] but that the main obstacle remains the lukewarm reception by consumers of the new medium<sup>2</sup>.

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<sup>2</sup> A recently completed study by Find/SVP [[10]] argues that although today nearly 31 million Americans, aged 18 or older – almost one in six adults –regularly use the Internet or commercial online services, the Internet is still a bittersweet

Why are customers so indifferent despite investing large amounts of money in developing an online presence?

Many early ventures in cyberspace were driven by arguments like the support of existing advertising and marketing efforts, or the reduction of customer service costs [[11]]. At the beginning only a few considered the Web as a truly new business opportunity rather than just an easy additional promotional channel. However, once a site is established the challenge really starts. The site needs to draw on a sensibly large audience, satisfying not just their initial thirst for information, but continuously creating new opportunities for the individuals to profit when visiting that particular site. It turned out that the maintenance of a Web site was more difficult to handle than some imagined first. Some of the most current mistakes when operating a site are listed in Table 1.

Some current mistakes when operating a Web site:
<ul style="list-style-type: none"> <li>• The content on the site is not kept up-to-date,</li> <li>• The Web initiative was not/not fully integrated with the company's general IT strategy and infrastructure,</li> <li>• The experience for a visitor was reduced to browse the latest annual report, which is clearly not enough,</li> <li>• Many companies thought increase in sales rather than customer service,</li> <li>• The power of e-mail/feedback was ignored. An unanswered feedback creates a great disappointment,</li> <li>• To get the content was not made easy for visitors,</li> <li>• The companies did not take advantage of the unique characteristics of the medium.</li> </ul>

**Table 1: Some current mistakes when operating a Website**

### 3.2. Transaction Phases in Electronic Markets

#### Electronic Markets

Malone, Yates and Benjamin [16] have argued that new 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 [26], [33].

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experience: Although a growing number of people describe as "indispensable", almost half of all users still find the technology "somewhat" or "very" difficult to use. Users told Find/SVP the Internet's greatest charm is the vast amount of information it can offer – but they also said they often cannot find what they're seeking. Only about 22 percent of adult users seem to be satisfied with their ability to find things. The five most likely online purchases by consumers are computer software, books, computer hardware, gifts, flowers, and music compact discs.

Information and communication technology is 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 (IT) has significant impact on industrial organization as well as individual organizations. Malone, [[16], see also e.g. [21], [18]] 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. [3]]. 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 [[15], [25]].

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 [[21], [24]], 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 [e.g. [26], [35]], which are information, agreement, and settlement phase (Figure 1).



**Figure 1: Traditional Transaction Phases**

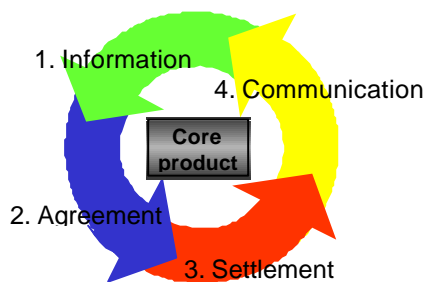
- **Information Phase**  
In the information phase customers collect information on potential products and services. They look for possible suppliers, asking for prices and conditions. The information phase covers the initial satisfaction of a consumer's need for information to conciliate his demand 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, she actually also reads before deciding which book to buy. 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. We therefore add a fourth phase to the transaction process – communication – as depicted in Figure 2.



**Figure 2: Continuous Transaction Phase Model**

- **Communication**

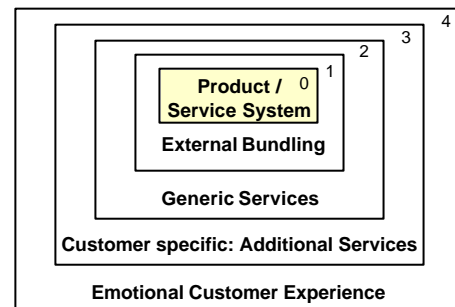
The concept of "Community", discussed in recent literature [[20], [27]] serves as essential tie between two transactions. The "communication" taking place among customers and between customers and the firm, links the product more firmly to them. Shared beliefs allow for the building of communities that generate a certain level of trust among their respective members [e.g. [1], [9], [13]] and thus inspire a fertile electronic commerce environment.

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 Bussang [[30]] 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.

### 3.3. Performance System

In marketing the term performance marketing [[2]] defines the quest to offer a customer not just the product itself, but the endeavor to propose a specific solution for individual customer segments, if not each customer itself. Why should a company try to cater for such small customer segments? Customers today show a very rational and price sensitive behavior. A firm 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) external firms, v) price and quality arrangements, vi) delivery, vii) set-up and training, viii) continuous service agreements, ix) and an emotional customer experience. The evolving five layer model of a performance system is illustrated in Figure 3.



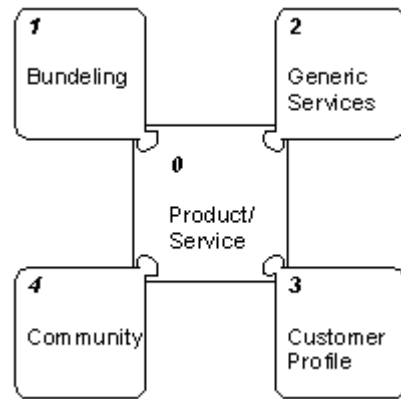
**Figure 3: Performance System adapted from Belz [[2]]**

The resulting performance system in the case of an airline might look like listed 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**

However, for the purpose of the present study a layer model does have some disadvantages, because when applied to individual transaction phases, it quickly becomes obvious that generic services, for example, are not really a part of the information phase. We adopted a model that rearranges the layers in five modules as sketched in Figure 4.



**Figure 4: Performance System rearranged in Modules**

### 3.4. The Web Assessment Model

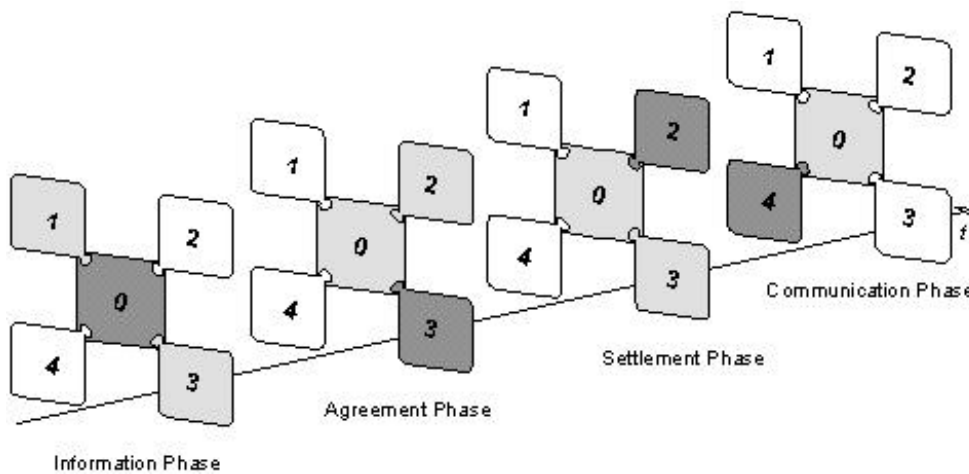
Putting it all together produces a model to assess electronic commerce applications. The extended electronic markets transaction phases in conjunction with the product system adds up to the model depicted in Figure 5. In each transaction phase different modules are of central importance to create a seamless electronic commerce application covering the entire transaction process. The importance awarded to each modules at different stages of a transaction is highlighted by different gray shades. And, an individual module needs not to be utilized in each transaction phase. The important point is to provide a seamless integration of modules in each transaction phase and among the phases in regard to the application provided.

In order not to overload the picture we concentrate on the media's inherent characteristics. The criteria listed in the next section are specific to the Internet. The paper focuses on a business-to-retail relationship, and deals with

it from the view point of a retail customer. As outlined in the concluding section the model needs to be extended to include criteria specific to the industrial sector, a more detailed discussion of company internal processes, and a business-to-business perspective.

#### Set of Criteria

For each module the criteria have been derived from the media inherent characteristics (cf. Table 3). On the following page we



**Figure 5: The Web Assessment Model**

Media inherent characteristics	Criteria	Example
• Hyper-media presentation	– Structure of content (good - poor)	Access to information, first impression,
	– User interface (flexible / intuitive - inflexible / hard to understand)	Transparent navigation, how to find information
	– Combination possibilities (given - n. given)	Easy access to complete product range
• 24 hour access (time)	– Availability / Performance of the system (good - poor)	Fast loading times
	– Contact possibilities (well implemented - not implemented)	Help desk , FAQs, eMail, Feedback response time,
• Ubiquity (spatial)	– Availability / Performance of the system (good - poor)	Available to customers regardless of their geographic location, mirror sites
• Configuration possibility (interactivity)	– Customization possible according to customer profile (good - poor)	Individual starting pages
	– Possible configuration of product combination (good - poor)	Easy creation of a shopping basket
• Database interface (expert system)	– Customization possible according to customer profile (well implemented - not implemented)	Special offers for certain customer segments
	– Possible configuration of product combination (good - poor)	EC system suggests possible combinations and alternatives
• Anonymity	– Discretion (guaranteed - ignored)	Secure transfer of data
• Asynchronous communication	– Contact possibilities (well implemented - not implemented)	Mailing lists, FAQs, eMail, Feedback response time
• Benefits to the customer due to the use of the Internet	– Benefits passed on the customer (realized - not realized)	Cost reductions
	– Possible integration with (IT) infrastructure of customers (possible - impossible)	Data transfer and integration in customer application

are specific to the remaining modules have been determined. Space requirements do not allow to publish the exhaustive list of criteria. However, a more extensive set of criteria may be obtained from the authors.

As a next step, a tool has been developed to quickly assess an electronic commerce Website (<http://www.businessmedia.html/wa.html>). When assessing a site each module and corresponding criteria are applied consecutively to each transaction phase with an emphasis on its most important module as visualized in Figure 5 (e.g. in the 3rd phase, the settlement phase, on the easy integration of generic services). The data gathered is aggregated and permits an overall judgment of the site, with specific figures on the performance of each transaction phase.

For the ease of use of the tool we reduced the number of criteria in the assessment form.

The appraisal range is from 1 to 4, 1 suggesting the assessor disagreeing strongly with the positively phrased description, 4 indicating his strong agreement.

Table 4: Media inherent characteristics of the information phase. give an example of the full range of derived criteria including the appraisal range in brackets (cf. Table 4) in the information phase.

Media inherent characteristics	
• Hypermedia presentation	• Database interface (expert system)
• 24 hour access (time)	• Anonymity
• Ubiquity (spatial)	• Asynchronous communication
• Configuration possibility (interactivity)	• Benefits to the customer due to the use of the Internet

Table 3: Media inherent Characteristics

In addition to the criteria in Table 4, which are applicable to some extent in every module, criteria which

3 <sup>rd</sup> Phase: Settlement	4	3	2	1	0
Easy Selection of Generic Services					
Good Integration of Generic Services					
EC Application Makes Effective Use of Customer Profile (e.g. payment and logistic information)					
Good Tracing and Tracking (e.g. direct access to personal order information)					
Good IT-Integration into Customer Infrastructure (e.g. information can be exported into MS Money)					
Good after-sales integration (e.g. guarantee handling form, feedback form)					

Table 5: Phase 3 – Settlement, criteria applied to the Swissair case.



Figure 6: Web site of Swissair

The 0 option – “not applicable” is meant to say that the criterion is not relevant for the Website (e.g. Logistics are no problem in the case of digital products).

In the case of Swissair (cf. Table 5) there is some sort of selection possibility for generic services along with a basic integration of these services in the booking process (payment, logistics). However, neither tracing & tracking, nor IT-integration, nor a good after-sales integration is implemented, though potentially important for an airline company, that wants to be successful in cyberspace.

The list of criteria is not exhaustive and needs still some fine-tuning for each case applied to.

## 4. Cases – The Web Assessment Model applied

### 4.1. Swissair

Swissair, Switzerland's national carrier, was created in 1931 upon the merger of two pioneering Swiss airlines. The company is today a major player in the (European) airline industry with a wide range of activities going far beyond its core airline business, such as Hotels, in-flight catering,

airline IT, etc. To compete in the global marketplace Swissair formed various partnerships and is currently undergoing a major restructuring to get the group out of the red ink, into more profitable waters. In 1996 the group operating profit stood at Swiss Francs (CHF) 344 million, an increase of 40 per cent from 1995. But exceptional provisions had a substantial impact on bottom-line results and led the group to post a CHF 497 million loss for the year 1996.

### 4.2. Swissair online

Swissair is for a number of years very active in various online ventures. The company was e.g. a founding member of the Galileo CRS (Computerized Reservation System) and has been participating for a number of years in the Swiss Videotext venture, involving the selling of special fares online to (Swiss) retail customers (using TV sets as interfaces totaling 40'000 ticketing transactions a year). For about one-and-a-half years now Swissair has a site on the World Wide Web. The initial driving force was the American division of the marketing department, pushing as early as 1995 for a presence. The management gave it a go and soon afterwards defined firm rules for the online presentation of the company. The site underwent a major overhaul late last year and welcomes a visitor today as depicted in Figure 6.

The assessment of the site took place on their own initiative. Before conducting in-depth interviews with people from various departments (IT, Marketing, Sales), we sent a brief questionnaire. Swissair representatives contributed actively to the elaboration of the model at various workshops. The data exposed here, represents an aggregation of the findings, omitting detailed material because of space limitations.

### 4.3. Web Assessment of Swissair.com

#### Description of the Site.

The Web site is divided in three parts covering company information, product information, sales and promotions.

- **Company Information**

- *Swissair near you* provides information about airline offices and reservation numbers.
- *Very useful info* contains phone numbers, and email addresses to get in touch with the company, as well as information on the site itself, and related items such as how to become a pilot.
- *Media Bytes* includes the latest press releases and information taken from the annual report.

- **Product Information**

- *Frequent Flyer Program* details the array of benefits offered to those who travel frequently.
- *The Flight Timetable* section allows an online query for all Swissair flights around the globe.

- **Sales and Promotions**

- *Online Booking* lets a customer make a booking, although limited to special offers and youth fares only.
- *Best Buys* lists some special fares available in certain countries only.
- *Fly the DC4* introduces a anniversary celebration and promotional offer to fly with a DC4 across the Atlantic.

- *Youth Fares* attracts young Swiss travelers who chose Swissair as their means of transport when planing their next trip.

The site is fairly lean and tries to promote the refreshing image the company wants to be connected with.

**The Web Assessment Model Applied**

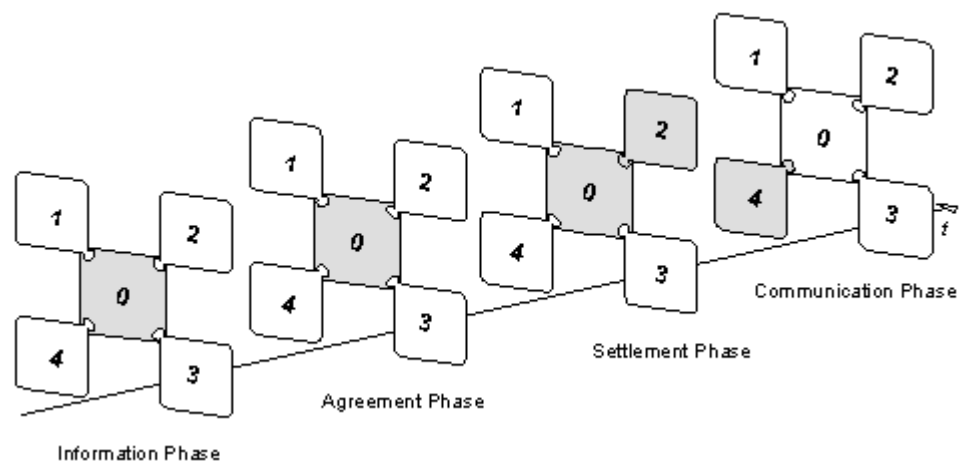
When applying the model to the site, considering each phase on its own, the following overall picture emerges (Figure 7):

At the moment the current site employs in each transaction phase the various modules only partially, offering at each stage limited possibilities of information gathering, interaction, and purchasing of flights.

**Information Phase**

Swissair provides fairly limited information on their own products. The timetable section is well made and provides up-to-date information on schedules, including a possibility to check actual arrival and departure times of planes on the day of travel itself. The *product / service system* idea is barely implemented, offering only static information on Swissair’s own hotel chain.

As an example Table 6 summarizes the results of the appraisal of the *product / service system* module in phase 1 (information phase).



**Figure 7: Current state of Swissair’s site and modules utilized**



Media inherent characteristics	Criteria	Case Swissair
• Hypermedia presentation	– Structure of content	Good, easy accessible
	– User interface	Medium, not immediately transparent where icons will lead to
	– Combination possibilities	Poor, existing product is not reflected on the site
• 24 hour access (time)	– Availability / Performance	Medium, loading times extended because of graphics
	– Contact possibilities	Medium, eMail feedback, response time good
• Ubiquity (spatial)	– Availability / Performance	Medium, offers have Swiss/Americas bias
• Configuration possibility (interactivity)	– Customization	Poor, fixed customization biased on youth specials
	– Configuration of product	Not implemented
• Database interface (expert system)	– Customization	Not implemented
	– Configuration of product	Not implemented
• Anonymity	– Discretion	Poor (in settlement phase only)
• Asynchronous communication	– Contact possibilities	Medium, eMail feedback, response time good
• Benefits to the customer	– Benefits passed on	Not realized, same fares apply as with traditional channel
	– Infrastructure integration	Impossible

**Table 6: Product / service system module**

### Agreement Phase

The site does not support any negotiation or contracting possibilities going beyond the prefixed terms and conditions of the online bookable special fares. The site does not allow any price inquires for normal tickets, neither special offers not listed on the Web site.

### Settlement Phase

The *Youth Fare* and *Best Buy* sections contain a number of special fares that may be booked online. The reservation system has a direct connection to Galileo to check for seat availability. The systems itself is rather clumsy to use, since a booking takes 10 steps (with reloads of the complete page) before the transaction is completed. The payment method involves traditional credit card charging, the tickets being delivered by post, or waiting pick-up at the check-in counter.

### Communication Phase

With its Web site Swissair wants to target a younger public. The *Youth Fare* section features a very nice section “Vermisst” (Missing), where guests may fill out an electronic postcard indicating why they would like to travel to one of Swissair’s destinations. Once a month the most poetic card is rewarded with a ticket to that destination. The success has been remarkable with multiple entries

each day. The number of online bookings is increasing steadily but the precise number is not made public. Swissair employees reckon that it is hard to determine the number of bookings initiated at travel agents as a result of visiting the site.

### Summary

The site was established to gain foothold in the Internet and learn about the possibilities of the new medium. The initial target audience were young people, said to be more familiar with the Net. There was no rigorous business model developed before designing the site. The result is a site that covers each phase of the transaction process partially with some positive points regarding the establishment of a communication module for young travelers. The Web site of Swissair is similar to other airline sites and matching experiences by competitors.

The fact that the site does not qualify for a best practice example in electronic commerce has much to do with the current structure of the airline industry and associated distribution channels. Some of

the early online travel agents went offline recently [7]. The reason is a cross channel competition between the traditional distribution channel, namely tour operators, and travel agents and the new cybermediaries. Swissair executives acknowledge the situation and are working vigorously to develop the Internet into an additional distribution channel trying to accommodate both parties.

### 5. Further Research and Concluding Remarks

The present paper focuses solely on the external view regarding a business-to-customer relation. 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 a business-to-business case, as this is expected to be the major growth area in electronic commerce in the years to come [8]. We aim at establishing a set of reference cases that will allow to collect more data and eventually build up a benchmarking database in order to derive best business practices. Furthermore the model may be extended to accommodate the internal perspective, too, as outlined in section 3, and should be applied to company internal and cross-company information systems (intranets, extranets). The next step would be the development of a first software

module that allows operators of electronic commerce applications to assess their site themselves.

The proposed model indicates a possible method for evaluating Web sites, making a comprehensive analysis of the usage of the new medium in a particular business case. Applied to the case outlined above, we believe to have proven the effectiveness of the approach, as the current body of literature does not provide for a rigorous method to do so.

As the Web develops, clients become more demanding. In addition electronic commerce on the Web is at a decision point: either companies will develop sound electronic commerce strategies, investing larger sums, establishing more sophisticated electronic commerce applications, and associating their customer to that process or they will not see a satisfactory return (not measured in monetary terms alone, but e.g. increased customer satisfaction) on their online efforts.

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