Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 1998 Proceedings

Americas Conference on Information Systems (AMCIS)

December 1998

Maximizing the Customer Delivered Value with Web-based Mass Information Systems

Arno Scharl
Vienna University of Economics and Business Administration

Roman Brandtweiner
Vienna University of Economics and Business Administration

Follow this and additional works at: http://aisel.aisnet.org/amcis1998

Maximizing the Customer Delivered Value with Web-based Mass Information Systems

Arno Scharl
Roman Brandtweiner
Department of Management Information Systems
Vienna University of Economics and Business Administration

Abstract

This paper describes a research framework focusing on conceptual, marketing-oriented aspects of Web-based Mass Information Systems (WMIS) analysis and design with a special emphasis on the integration of adaptive system components for supporting negotiations, market segmentation, targeted direct marketing initiatives, and transaction processing. Methods to gather and analyze customer preferences and expectations as well as to visualize the actual behavior of WMIS users are identified in order to maximize the customer delivered value in global electronic markets.

WMIS Definition

In contrast to systems supporting Electronic Data Interchange (EDI) and wholesale trading, WMIS for on-line markets exclusively target individual customers. Mass information systems in general are global systems of various complexity that support on-line information retrieval and routine tasks by way of self-service for a large number (thousands or millions) of occasional users who are spread over various locations (Hansen 1995). WMIS as a sub-category of mass information systems rely on the hypertext functionality and transfer mechanisms of the World Wide Web. Being characterized by interactivity, dynamic updating, hypertextuality, and global presence they incorporate the concept of electronic catalogs (Palmer 1997) which represent any collection of documents "that contains information about the products and services a commercial entity offers" (Segev et al. 1995).

Introduction

Although infrastructural aspects will be discussed, the research framework described in this paper primarily aims at validating the usually technically determined state of the art of WMIS by integrating a marketing-oriented view on electronic markets in order to explain the nature and characteristics of business-to-consumer transactions. Focusing on the added value created for individual companies, this process has to include the identification of necessary preconditions for adaptive technologies, an in-depth analysis of the evolution of distributed hypertext environments, as well as the development of a methodology for gathering and using customer information in electronic markets. As a result from reduced barriers to market entry, WMIS transactions are more dynamic and potentially less predictable than their traditional counterparts. This is one of the reasons why socio-cultural characteristics of the Internet and the World Wide Web in particular have to be considered as external parameters by the participating institutions when designing their retail applications. Emerging standardized description models like the

- OPS—Open Profiling Standard (http://www.firefly.net/company/OPS.fly) or the
- P— Platform for Privacy Preferences Initiative (http://w3c.bilkent.edu.tr/P3/)

will provide valuable insights for the personalization of WMIS regarding geographic and demographic segmentation criteria. The role of customers is getting transformed in the virtual marketspace of WMIS. "Individual customers can act, if they choose to, as the analyst, the portfolio manager and the broker" (Dutta et al. 1997). Based on these insights and observable shifts within the corporate value chain (e.g., the convergence of production and communication), methodologies for integrating customer-specific information into retailing applications of WMIS are needed.

The Necessity of Global Marketing Concepts for WMIS

The strong specialization of academic research and practice in formulating, analyzing and implementing global marketing strategies for WMIS was a direct result from the insight that abstract marketing instruments cannot generally be applied to different sectors and industries without taking into account the specific features of these heterogeneous segments. The necessary consideration of core competencies is reflected in a number of highly specialized approaches for analyzing market-oriented decision behavior (Haller 1997). In the early seventies the first textbooks were published which explicitly dealt with trade marketing and emphasized the institutional function of trade. Prior to this rather focused approach trade was primarily regarded as a mere distribution channel of productive industries. With the gaining popularity of direct marketing the increasing importance of IT support was recognized as well. Direct Marketing represents a targeted, carefully planned communication process with

known customers (active or potential) which relies on historic and context-specific information usually being stored in corporate database systems, uses different media synchronously and provides instant customer feedback. The increasing convergence of product design, presentation, and communication goes hand in hand with the parallel use of customer-related information for specifying a company's product and communication policy - a fact which implies an integrated architecture for both productive and dispositive data processing. Such an integrated architecture is also reflected in the marketspace model of (Dutta et al. 1997).

Tailored solutions at a cost level comparable to that of mass marketing increase the degree of freedom for price policy, attract new customers, reduce price elasticity of demand, and create barriers to market entry for potential competitors (Reiss and Beck 1995). The convergence of information retrieval and usage as far as adaptive marketing systems are concerned makes the usual distinction between market research and market management obsolete. Nevertheless, isolated and sequential approaches are still quite common in business practice. Seen as a closed loop consisting of conceptual design, pre-test, stimulus, customer response, and performance analysis, adaptive systems contribute to a more realistic, dynamic user model and a more efficient allocation of limited marketing resources.

Customer Delivered Value

Integrated communication represents a frequently used term, describing efforts to combine different marketing instruments for an effective analysis and manipulation of information retrieval, decision and usage patterns of active and potential customers (Belz 1997). Some authors vehemently criticize these manipulative intentions although most customers—no matter which specific target group they belong to - demand both communication and product design to be tailored specifically to their personal needs and preferences. Customizing WMIS, therefore, aims at identifying potential customers and offering them the required products at the right time and conditions, using appropriate representations and terminology (Link and Hildebrand 1995). In operational terms this target may be expressed by maximizing the customer delivered value, which is calculated as follows (Kotler et al. 1996):

Total Customer Value
(Product, services, personnel, image values)
EQUALS **Customer Delivered Value**
(Monetary, time, energy, and psychic costs)
EQUALS **Customer Delivered Value**
("Profit" to the consumer)

Analogous to traditional markets, users of WMIS buy the required products and services from the (information) provider that they believe offers the highest customer delivered value. Due to the immaterial, non-tangible, and transitory nature of services and due to the fact that production and consumption take place synchronously, the value of product-oriented market research in the traditional sense is drastically reduced. The focus on products has to be replaced by an in-depth analysis of customers and target groups including personal needs, preferences, and expectations (Huettner 1997).
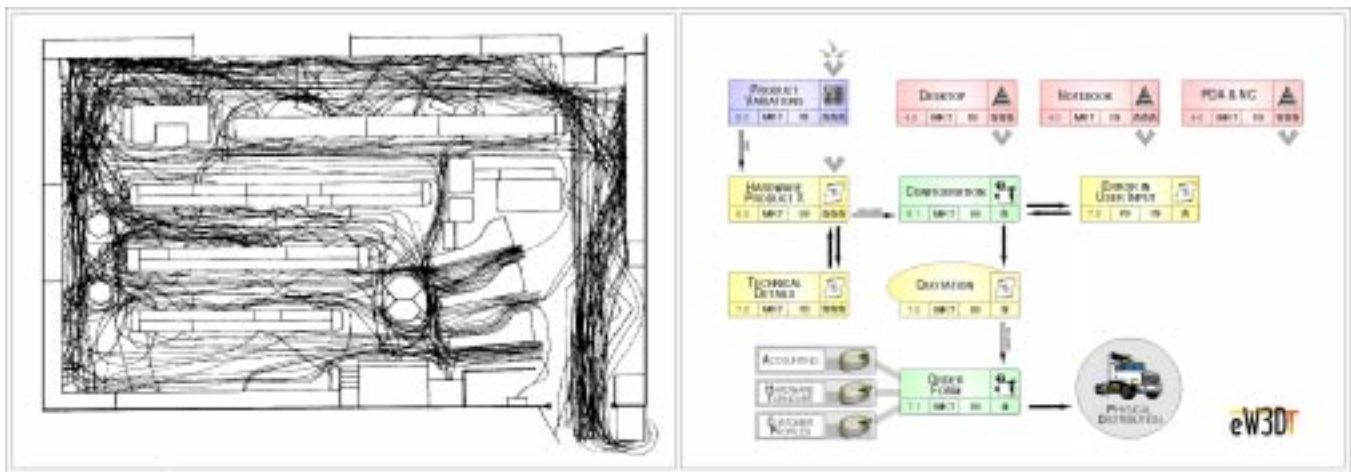
Figure 1. Customer Tracking in Traditional Retailing Outlets and WMIS (Becker 1993; Scharl 1998)

Visualization of Customer Behavior

The customer-oriented regular gathering of stimulus-response-data and its integration with stored information for creating dynamic user models in conformity with observable real-world patterns help the information provider to map and classify the customer's behavior, to describe its geographic and temporal distribution, and to predict future behavior as accurately as possible (Link and Hildebrand 1995; compare Jaspersen 1997). The granularity and quality of the resulting data base entries determine

the degrees of freedom for the information provider, the ability to maximize the customer delivered value, as well as the overall economic potential of every single project relying on this important source of information.

For this reason the user-centric and document-oriented eW3DT-metamodel (extended World Wide Web Design Technique; Scharl 1997; Scharl 1998) for the description of WMIS has to be modified and—as a prototypical, platform-independent implementation in Java—will be employed to provide a visual framework for analyzing access patterns of WMIS customers. Figure 1 compares customer tracking in traditional retailing outlets as presented by (Becker 1973) with a graphical, customer-centric WMIS representation using the metamodel mentioned above. Independent of iconic similarity and real equivalence to a given object, every information object type defines a general profile for describing the characteristic attributes of this object. Each of these profiles corresponds to a set of abstractions commonly found in WMIS. With regard to the application domain of the Java prototype, however, the rectangular symbols representing different types of hypertext compound documents will incorporate a different set of attributes (number of hits, page views, average viewing time of documents etc.). When analyzing electronic markets instead of their traditional counterparts, the important question of how to optimal place physical goods is replaced by decisions concerning the appropriate depth and width of electronic product catalogs and the recommended hierarchical layer for presenting certain products or services.

Conclusion

By modifying the eW3DT metamodel we plan to enhance the current, in most cases only statistically oriented representations used by commercially available Web-Tracking-Software with a graphical overview analogous to customer tracking which is quite common for traditional retailing outlets. This will help commercial information providers in their efforts to map and classify the customer's behavior, to predict future trends, to advertise more effectively, and to maximize the customer delivered value of electronic transactions.

References

Becker, W. *Beobachtungsverfahren in der demoskopischen Marktforschung.* Eds. O. Strecker and R. Wolffram (= Bonner Hefte für Marktforschung, Bd. 9). Stuttgart, 1993: Ulmer.

Belz, C. *Strategisches Direct Marketing: Vom sporadischen Direct Mail zum professionellen Database Management.* Vienna, 1997: Ueberreuter.

Dutta, S., Kwan, S. and Segev, A. "Transforming Business in the Marketspace—Strategic Marketing and Customer Relationships," *CMIT Working Paper.* Berkeley, 1997: CMIT / University of California.

Haller, S. *Handels-Marketing.* Ed. H.C. Weis (= Modernes Marketing für Studium und Praxis). Ludwigshafen, 1997: Kiehl.

Hansen, H.R. "Conceptual Framework and Guidelines for the Implementation of Mass Information System," *Information & Management,* 02/1995: 125-142.

Huettner, M. *Grundzuege der Marktforschung.* Munich/Vienna, 1997: Oldenbourg.

Jaspersen, T. *Computergestütztes Marketing: Controllingorientierte DV-Verfahren für Absatz und Vertrieb.* Munich/Vienna, 1997: Oldenbourg.

Kotler, P. et al. *Principles of Marketing —European Edition.* London, 1996: Prentice Hall.

Link, J. and Hildebrand, V.G. "Wettbewerbsvorteile durch kundenorientierte Informationssysteme - Konzeptionelle Grundlagen und empirische Ergebnisse", *Journal fuer Betriebswirtschaft,* 01/1995: 46-62.

Palmer, J.W. "Retailing on the WWW: The Use of Electronic Product Catalogs," *EM - Electronic Markets,* 03/1997: 6-9.

Reiss, M. and Beck, T.C. "Performance-Marketing During Mass Customization," *Marktforschung & Management,* 02/1995: 62-67.

Scharl, A. *Referenzmodellierung kommerzieller Masseninformationssysteme—Idealtypische Gestaltung von Informationsangeboten im World Wide Web am Beispiel der Branche Informationstechnik.* Frankfurt, 1997: Peter Lang.

Scharl, A. "Reference Modeling of Commercial Web Information Systems Using the Extended World Wide Web Design Technique (eW3DT)," *Proceedings of the Thirty-first Hawaii International Conference on System Sciences*, Los Alamitos, CA, 1998: IEEE Computer Society Press. 476-484.

Segev, A., Wan, D. and Beam, C. "Designing Electronic Catalogs for Business Value: Results of the CommerceNet Pilot," *CMIT Working Paper.* Berkeley, 1995: CMIT / University of California.