Chapter 5

The Five Stages
of Customizing Web-Based Mass
Information Systems

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Abstract

Web-enabled standard software for electronic commerce incorporating adaptive components will reduce the barriers between productive data processing and dispositive data processing like market analysis, Web-tracking, or data warehouses. A conceptual research framework for analyzing the evolution of electronic markets as well as their business ecosystem represents the foundation of a document-oriented modeling technique for analyzing and designing (adaptive) Web-based Mass Information Systems. A Java prototype based on this meta-model is presented which supports cooperative efforts of academic research, IS departments, top-level management, and functional units to map and classify individual and aggregated customer behavior. The symbolic visualization of user clickstreams based on this analysis is intended to streamline the decision processes necessary for implementing, updating and maintaining complex Web-enabled applications.

Introduction

The commercialization of the Internet and the exponential growth of the World Wide Web in particular introduce communication channels to millions of consumers and computer users that previously were not utilized. While mass media channels are essential to disseminate initial information about an innovation, personal channels are essential to ensure acceptance of

this innovation (Rogers, 1995). Web-enabled applications provide the unique advantage of simultaneously supporting both types of channels. The success of the World Wide Web, therefore, was not only grounded on the graphical user interface provided, but also in the simple but effective and very flexible underlying communication architecture. By analyzing the evolution of electronic markets, the first part of this chapter builds the foundation for a subsequent outlook into future trends regarding modeling and designing Web-enabled applications. In contrast to systems supporting Electronic Data Interchange (EDI) and wholesale trading, Web-based mass information systems (WMIS) exclusively target individual customers. Mass information systems in general are systems 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; Hansen and Scharl, 1998). WMIS as a subcategory of mass information systems – next to kiosk systems or ATMs, for example – rely on the distributed hypertext functionality and transfer mechanisms of the World Wide Web. Being characterized by interactivity, dynamic updating, hypertextuality, and global presence are very similar to the concept of electronic catalogs (Palmer, 1997) which include any Web-page "that contains information about the products and services a commercial entity offers" (Segev, Wan and Beam, 1995, p. 11).

The strong specialization of academic research and practice in formulating, analyzing, and implementing 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 these features as well as an organization's core competencies is reflected in a number of highly specialized approaches for analyzing market-oriented decision behavior (Haller, 1997). Such an analysis represents the basic requirement for tailored solutions at a cost level comparable to that of mass marketing, increasing the degree of freedom for price policy, attracting new customers, reducing price elasticity of demand, and creating barriers to market entry for potential competitors (Reiss and Beck, 1995). The convergence of information retrieval and usage as far as adaptive WMIS are concerned makes the usual distinction between market research and market management obsolete. Nevertheless, isolated and sequential approaches are still quite common in practice. Seen as a closed loop consisting of conceptual design, pretest, stimulus, customer response, performance analysis, and adaptive systems contribute to a more realistic, dynamic user model and a more efficient allocation of an organization's limited marketing resources.

Due to the immaterial, nontangible, and transitory nature of services and

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