Scanning Multimedia Business Environments

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INTRODUCTION

The term *environmental scanning* (ES) refers to the way in which managers study their relevant business environment. More precisely, we define *ES* as both looking for and looking at information available in the business environment. These activities embrace all domains of gathering facts from external sources like *competitive intelligence* (CI) and market research, but take a more holistic, integrative perspective by considering consumers, competitors, and the technological developments in same industry and different industries as well (Scholz & Wagner, 2006). Choo, Detlor, and Turnbull (2001) give an overview of ES and empirical findings supporting the importance of ES activities in business organizations. ES helps managers foresee favorable as well as unfavorable influences and initiate strategies that enable their organizations to adapt to their business environments.

This article:

- outlines three perspectives on the challenges for environmental scanning arising from information dissemination by multimedia,
- discusses opportunities for ES on the World Wide Web (WWW), and
- exemplarily describes two software solutions for ES in multimedia.

The remainder of the article is organized as follows: the next section discusses challenges for ES arising from the increase of multimedia technologies in the business environment. Then, we discuss the impact of the WWW on ES. Subsequently, we present the state of the art in ES practice as well as the supporting software. The article concludes with a brief outline of future challenges in the field of ES.

ES IN MULTIMEDIA: CRAFTSMANSHIP, ART, OR SCIENCE?

Craftsmanship

Referring to Jauch and Glueck (1988), the external environment consists of the following six areas: (1) customers, (2) suppliers, (3) competition, (4) socioeconomic, (5) technological, and (6) governmental. As depicted in Figure 1, these sectors make up the firmament of an organization's information environment.

In the figure, the sectors are ordered with respect to their affinity to the industry environment on the left-hand side and the global *business environment* on the right-hand side. On the bottom plate, the internal information sectors are illustrated. The relevant internal business environment comprises research and development, market research, basic engineering, cost controls, financial management, and controlling departments (Garg, Walters, & Priem, 2003). Major aims are cost control and operational efficiency, but information fragments may be found in all internal media, particularly in the intranet, in-house presentations and protocols of all kinds of meetings. All tasks appear to be well ordered and, thus, sophisticated *ES* activities should be a good piece of artisanship. However, the artisan has to cope with two problems: the wide array of relevant topics and the diversity of information sources. Consequently, there is constant competition for the manager's limited attention among different topics, information sources, and fragments. Accordingly, scanning is a challenging task because a broad range of internal and external sources have to be exploited, data in different (often ill-specified) formats have to be combined, and the topics as well as the information sources of interest cannot be exhaustively described, a priori, but rather emerge during the scanning activities.

Art

ES aims to improve short-term and long-term planning and should lead to a better understanding of external changes. However, in the real world of management, ES is still far from being recognized as a structured task applied in daily managerial practice, for various reasons. First, this might be attributed to the perception of managers that systematic ES is user unfriendly (because of its quantitative methods), too complex (and thus simultaneously oversimplified, because of reducing to scope to very few of the relevant variables) and, therefore, might make them lose ground (Day, 2002). This problem becomes even more serious in the context of ES activities relying on multimedia, because the information is typically not presented in a well-structured and easily accessible manner. Professional tools for managing the ES process and systematizing these information sources are still not widespread in practice (Benczúr, 2005). Standard search engines, such as Google or Ask Jeeves, seem to be a great help in retrieving meaningful, relevant information at first glance, but do not organize the search results in a serviceable manner. Like art, ES requires connotations different from simple Web searches.

Science

The scientific perspective on *ES* in the *business environment* is dominated by the aim of identifying *weak signals* heralding significant changes in the industry structure or the relevant technology (cf. Martino, 2003, and Scholz & Wagner, 2006, for systematic literature reviews). In the early stages, the signals are small, subtle hints that are hardly distinguishable from the background noise. However, the earlier the organization detects these *weak signals*, the more time it has to successfully align the strategic decisions to emerging, forthcoming changes in the business environment. The central task of *ES* is to provide sound methodologies for the successful detection of relevant changes heralded in the information environment.

Modern computer technologies can help to identify the maturity of signals by means of data mining and bibliometric analysis of textual information sources. Intranet technologies provide promising solutions for managing knowledge repositories, and allow quick access to the sparse and distributed internal knowledge on the *external environment*. The most relevant characteristics of the information fragments provided by multimedia are their vagueness and the absence of links to other information that would make a consistent and meaningful picture. Thus, linking information fragments from different sources is the main challenge for the identification of *weak signals*.

The problem becomes more difficult if the prior knowledge of the decision maker is included in the problem formulation. Clearly, individuals have different knowledge of topic domains. They might be experts in very few domains, but these are not necessarily the relevant domains for grasping information fragments. The *information foraging theory* (Scholz & Wagner, 2006) provides us with a formal foundation for both modeling information seeking behavior and implementing innovative tools for gathering and combining information spreading over many media objects. An important element of this formal framework is the information infrastructure that captures the prior knowledge already gained with respect to an interesting topic. All incoming information fragments are assessed with respect to this prior knowledge, and the most interesting ones are selected for further consideration. In an empirical evaluation this methodology has been found to work well, even if errors are included in the information infrastructure (Scholz & Wagner, 2005).

WHAT A SIGHT: SCANNING THE WWW

The Internet—and in particular the WWW—provides the manager with excellent external information. Nowadays, the WWW consists of several billion documents that are largely designated for cost-free use. Trends in business, science, society, and politics are digitally announced on the WWW long before their consequences are observed in the real world (Decker, Wagner, & Scholz, 2005). McGoangle and Vella (1998) argue that 90% of all information needed by a company to make critical decisions is either already public or can be systematically developed from public data. As the WWW is both a publishing medium and an indispensable element of daily communication, almost all up-and-coming real-world phenomena are discussed in the virtual reality of the WWW. Therefore, Choo et al. (2001, p. 161) refer to the Internet as a "social information space."

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