Information and Communication Technology Tools for Competitive Intelligence

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INTRODUCTION

Competitive intelligence (CI) can be described as collecting and processing information about the environment for strategic purposes (cf. Kahaner, 1997). To formulate a strategy, an organization needs to collect and process information about its environment—about, for instance, competitors, customers, suppliers, governments, technological trends, or ecological developments. Collecting and processing environmental information has, of course, always been important. However, because of the increasing complexity and dynamics of the environment, the pressure to produce relevant, timely, "actionable" intelligence increases as well. At the same time, the amount of available data about the environment also increases.

To deal with this problem, it is necessary to structure intelligence activities, and many organizations use information and communications technology (ICT) to this end. They use, for instance, different types of Internet or intranet applications, so-called data warehouses, groupware applications, or applications specifically tailored to the organizations' intelligence needs. The number of possible ICT tools for CI is large, and an important question for organizations is which tools they should select and implement for their CI activities. Organizations face difficulties in selecting, implementing, and using these tools. Many ICT tools, for instance, lead to an information overload—to large collections of irrelevant data—or are expensive applications that only marginally contribute to the production of intelligence.

To select proper ICT tools for CI, an organization needs to understand the role of ICT for CI. This paper intends to address this understanding. In particular, it will present a short overview of the available tools and it will discuss a procedure for selecting appropriate ICT tools.

BACKGROUND

To understand the role of ICT for CI and to select proper ICT tools, the CI process needs to be clarified. To describe this process, several authors (cf. Fuld & Company, 2002; Gilad & Gilad, 1988; Herring, 1999; Kahaner, 1997) propose to use the intelligence cycle, consisting of four stages.

1. **Direction.** In this stage organizations determine their strategic information requirements; that is, they determine about what environmental aspects data should be collected. These aspects are also known as competitive intelligence needs (Fleisher, 2001) or key intelligence topics (Kahaner, 1997).

2. **Collection.** In this stage, the required data are collected. To this end, one needs to (a) determine what sources are available, and (b) access these sources and retrieve data from them.

3. **Analysis.** This stage focuses on interpreting data from a strategic point of view to determine their strategic relevance (if a piece of data is strategically relevant, the term intelligence is used; cf. Kahaner, 1997; Vriens, 2004). For this analysis, a model of what is relevant for the organization should be available. Often, tools such as Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, scenario analysis, war gaming, or competitor profiling are used to arrive at such a model (cf. Cook & Cook, 2000).

4. **Dissemination.** Here, the intelligence is made available for strategic decision making. That is, the intelligence should be presented clearly and distributed to relevant decision makers who use it to evaluate current strategic options and to generate, compare, select, and implement new ones.

Using this cycle as a background, many authors acknowledge the possible and actual use of ICT applications for CI activities (see, for instance, Chen, Chau, & Zeng, 2002; Cook & Cook, 2000; Fleisher & Blenkhorn, 2001; Fuld & Company, 2002). It is also a background for discussing the shortcomings of ICT applications for CI (e.g., Cook & Cook; Fuld & Company). In line with these authors, we will use this cycle of intelligence activities as a framework for reviewing, classifying, and selecting ICT applications, as will become apparent in the next sections.

A CLASSIFICATION OF ICT TOOLS FOR CI

ICT tools for CI can be classified according to two "dimensions": (a) their contribution to one or more stages of the intelligence cycle and (b) the specificity of the tool—that

is, a tool can be either a general ICT tool used for intelligence activities (like a groupware application, used for direction activities) or a tool specifically tailored to one or more intelligence activities. Below, we first discuss the Internet as a "general" ICT tool for all CI activities. Next, we pay attention to other ICT tools, both general and specific. Finally, we discuss so-called business intelligence applications as a specific set of ICT applications.

The Internet as a Tool for CI

CI practitioners rely heavily on the use of the Internet for their intelligence activities. Some authors report the use of the Internet for supporting the direction, analysis, and dissemination stages, for example, Web Enabled Technology (WET) applications enhancing communication and collaboration regarding results of this stages (e.g., Teo & Choo, 2001). However, most attention has been paid to the use of the Internet for collection activities. Among the reported uses of Internet applications for collection activities are the following.

- **Search engines**
  The CI literature discusses many types of search engines and their application for CI (cf. Chen et al., 2002; Cook & Cook, 2000).
- **Tools for outsourcing collection activities**
  A part of the collection activities can be outsourced to some (automated) service or tool offered via the Web. Particularly popular is the use of commercial online databases (Kahaner, 1997; Chen et al., 2002). Another example is the use of Web robots or agents that "automatically traverse the hyperlink structure of the WWW [World Wide Web] to locate and retrieve information" (Tan & Kumar, 2002, p. 9).
- **Tools for text analysis**
  Tools supporting the collection of data in (large) Internet-based text files are used.
- **Tools for monitoring changes on the Web**
- **Tools for collecting data about the electronic behavior of Internet users**. These tools work, for instance, by identifying users' navigational patterns (cf. Tan & Kumar, 2002).
- **Internet tools for collaboration in collection activities.** Internet applications can be used to facilitate the collaboration in collection networks (networks of people performing collection activities).

General and Specific ICT Tools for CI

Besides using general Internet applications for CI purposes, other general ICT applications can be used as well.

Examples are tools supporting the following.

- **Supporting the process of identifying strategic information needs** such as different types of groupware or software supporting group model building (e.g., Vennix, 1996).
- **Supporting specific methods used in analysis**, for instance, system-dynamics software enabling CI professionals to run simulations with certain data, and thus helps to establish their relevance.
- **Supporting (management of and collaboration in) the process of analysis**. Specific groupware applications may serve this purpose.
- **Supporting the dissemination of intelligence**—for example, applications supporting (a) the presentation of the intelligence in a suitable format and/or (b) the transmission of reports throughout the organization

There is also a class of ICT applications specifically designed for one or more CI activities. Fuld & Company (2002) analyzed and evaluated a number of such dedicated CI software packages. They concluded with the following.

(1) The "CI software cannot drive the CI process" (p. 2), but it can help in collecting data, in reporting and communicating intelligence, and in supporting the work flow and collaboration.
(2) No application can deal with all the intelligence stages adequately.
(3) No application can "truly conduct qualitative analysis" (p. 10), but some tools seem promising in assisting CI analysts to see novel linkages.

Business Intelligence Applications

For some time, the terms competitive intelligence and business intelligence (BI) were used as synonyms. Nowadays, however, the term business intelligence is often used to indicate a specific set of ICT tools. These BI tools refer to ICT tools enabling (top) management to produce overviews of and analyze relevant organizational data needed for their (strategic) decision making. BI tools typically include data warehouses and tools for extracting and presenting information from them (cf. Cook & Cook, 2000; Zanasi, 1998). In essence, a data warehouse is a large database in which data from many different databases (e.g., transactional, financial, or personnel databases) are copied and stored in such a way that they are readily accessible. To access, view, and analyze these data, specific tools are developed (e.g., data-mining tools for finding relations between classes of data). Using data

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