

Comparative Analysis of Competitive Intelligence Software Applications: An Examination of Some Value-added Processes

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ABSTRACT

Competitive intelligence (CI) is an example of a particular set of information-related activities aimed at adding value to information to support decision making. There is a growing number of software applications aimed at providing assistance to organizations for implementing a CI system. An exploratory study was undertaken to compare selected CI packages to assess their value. A review of the literature led to the identification of six distinct processes pertaining to CI and of 31 evaluation criteria. Data analysis reveals that these applications neglect several processes of the CI cycle and this calls into question their potential to add value to information.

RÉSUMÉ

La veille concurrentielle comporte un ensemble d'activités visant à ajouter de la valeur à l'information afin d'aider à la prise de décision. Un nombre toujours croissant de logiciels prétendant aider les organisations à implanter un système de veille sont mis sur le marché. Une étude exploratoire a été menée dans le but de comparer et d'évaluer la valeur de certains de ces logiciels. Six processus reliés à la veille et 31 critères d'évaluation ont été identifiés à partir d'une revue de la littérature. L'analyse des données révèle que ces logiciels n'intègrent pas plusieurs dimensions de la veille, d'où un questionnement quant à la valeur qu'ils peuvent ajouter à l'information.

BACKGROUND

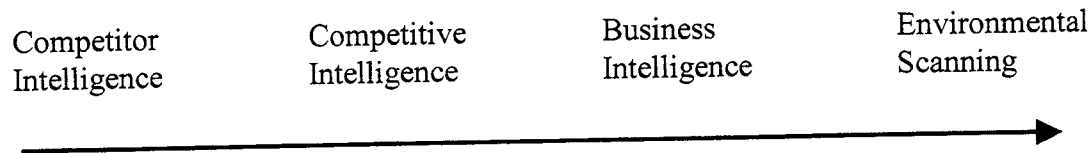
The development of information technology offers opportunities for rethinking the way information services are designed in libraries and in other types of organizations. More importantly, innovation brings new means to access information. On the one hand, new applications enhance the possibility of adding value to information in order to assist users to make decisions (Taylor 1986, Choo 1998) by improving physical and intellectual access to information. On the other hand, information technologies offer potential for disintermediation (Atkinson 1996) or the progressive elimination of human mediation in order to establish a more direct link between users and information sources. Anyone interested in the design of information services must then take into account new technological innovations and assess their potential for improving existing services. Competitive intelligence is an interesting example of a particular set of information-related activities aimed at adding value to information to support decision making.

Competitive intelligence (CI) has never attracted so much attention from both the business community and information specialists. As a result, a growing number of software applications designed for providing assistance to organizations and managers in implementing a CI system are now available. To date, no systematic evaluation of these applications has been performed using an information resource management approach. The fact that CI can be interpreted in various ways and encompasses various dimensions makes the task of establishing evaluation criteria difficult. It is also unclear whether these new technologies are able to add more value to information than the more traditional database management software applications. Without evaluation criteria, there are no grounds on which to assess whether or not the purpose of these technologies is met.

VALUE-ADDEDNESS

The idea that information systems and services should add value to information derives from a basic assumption that users will employ them to extract what seems to be of value. As Taylor (1986) points out, an information system is a series of value-adding processes, the results of which help the users to make decisions or clarify problems. Information may have different potential for value depending on the type of users and the environment. Processes that add value are "those activities of information systems which provide mechanisms that (a) can signal this potential and/or (b) can relate the potential to a specific problem in a specific environment" (Taylor 1986, 17). Thus, different systems may add different types of value to information. Taylor identifies six broad categories of criteria that users employ to select systems and services. These criteria encompass 22 types of value that a system can add: ease of use (browsing, formatting, interfacing, ordering, physical access); noise reduction (intellectual access, linkage, precision, selectivity); quality (accuracy, comprehensiveness, currency, reliability, validity); adaptability (closeness to problem, flexibility, simplicity, stimulatory); time and cost savings. Examining the functions of libraries, Atkinson (1996, 241) suggests that "the purpose of information services is to add value to specific objects (that is, sources) of information from the perspective of (usually local) clientele". Therefore, the essence of information services is to add access value to objects of information in order to reduce access time, but only to a subset of objects selected on the basis of their content value. Similarly, an information system is intended to reduce access time to a particular set of information resources retrieved from a content perspective. This focus on access time has led to disintermediation, or the development of mechanical links empowering users to access resources without the assistance of human mediation. Many information technology products are designed for end-users directly and, in principle, should reduce the need for human intermediaries since value can be added automatically.

COMPETITIVE INTELLIGENCE AND CI SOFTWARE



Environmental scanning is the broadest term and encompasses collecting all “information about events, trends, and relationships in an organization’s external environment” (Choo 1998, 72). At the other extreme, competitor intelligence focuses on competitors’ strategies and potential moves and involves a narrower objective. CI is considered as having a smaller scope than business intelligence but larger than competitor intelligence. CI usually deals with the analysis of competitors and competitive conditions of particular industries and regions, and puts emphasis on qualitative information. The concept of business intelligence is often used interchangeably with CI because it includes the analysis of competitive conditions but also the analysis of acquisitions, mergers, and entry risk assessments to the competitive environment (Choo 1998). Business intelligence seems to rely more heavily on quantitative data. In 1999, Survey.com projected that the sales of business intelligence and CI software will reach \$148 billion by 2003 (Fuld & Co 2000). It is then timely to ask what is the exact scope of CI software packages, and to what extent these information systems add value to public information sources. The numerous software evaluation methodologies that can be found in the information management literature tend to focus on efficiency, especially regarding recall and precision, and user criteria. For instance, Sieverts and Hofstede (1994) developed eight categories for evaluating information and retrieval software: technical requirements; special versions and security; use of the program; limitations; input and maintenance of data; indexing of stored information; retrieval of stored information; and output of data. Richards (1995), also with text retrieval in mind, categorizes the evaluation criteria into four areas. The top-level criteria include functions related to searching the database and accounts for 80% of the evaluation. Operational criteria refer to the execution of tasks and movement between menus. Navigation criteria include moving between and within records. And, ergonomics criteria deal with the layout of screens, use of color, and terminology used. While these criteria are useful for evaluating information retrieval software, they are not appropriate for evaluating CI software because it is not possible to properly evaluate off-the-shelf commercial products in the absence of a context. This context represents that portion of the system for which the product should exhibit fitness (Carney & Wallnau 1998). Therefore, a proper evaluation of CI software must include criteria that measure a system’s CI fitness or its ability to perform the CI function. While a unique set of criteria for the product’s

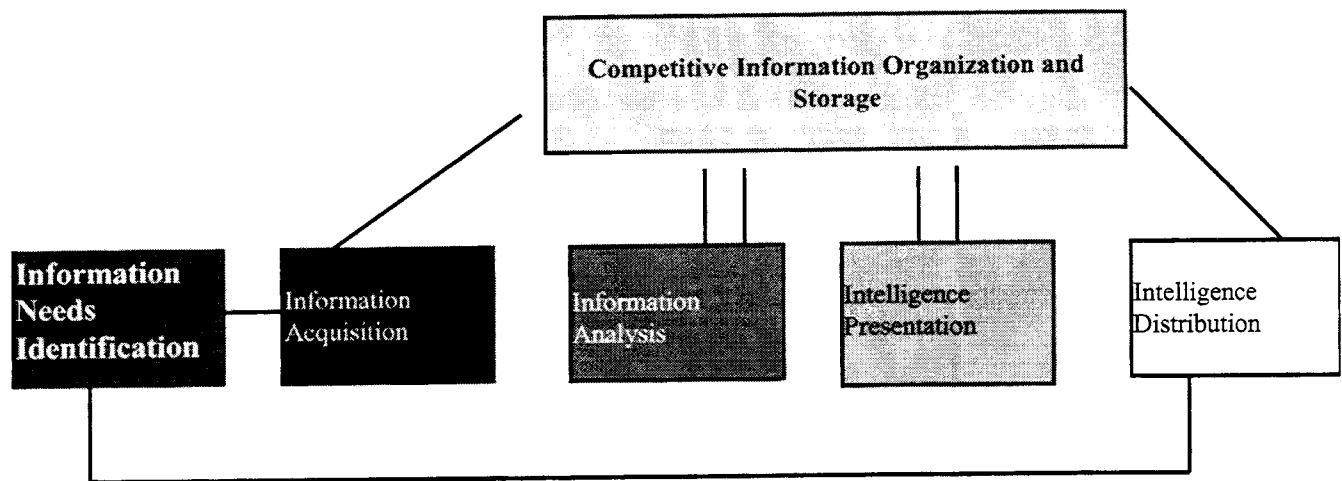
fitness based on its purpose and on the individual needs of the consumer would constitute the ideal scenario, the development of customized evaluation measures is both time consuming and often beyond the ability of many end-users. Hence, the development of a standard set of criteria with which to establish the basic fitness of a given software product to perform CI is needed in order to aid the end-user.

THE STUDY

The exploratory study undertaken in Fall 2000 pursued three objectives: to operationalize the concept of CI in order to identify its main processes; to develop a set of evaluation criteria based on these processes; and to test the validity of these criteria.

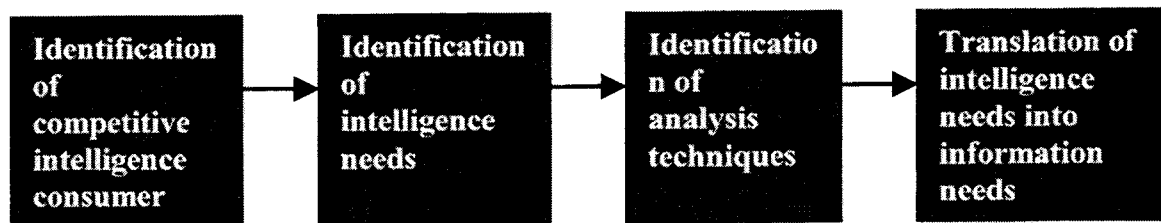
Conceptualization of CI cycle

Another aspect of CI that bears further discussion is the nature of the processes involved. Since it is a function that should be performed on a continuous basis in an organization, CI is often conceptualized as a cyclical process. For instance, Fuld & Co (2000) described it in 5 consecutive steps: (1) Planning and direction; (2) Secondary/published information sources; (3) Primary source collection; (4) Analysis and production; (5) Report and inform. Pirttilla (1998) outlined another CI cycle: (1) Definition of competitors and information needs; (2) Systematic collection of competitive information; (3) Screening and analysis of collected information; (4) Distribution to relevant user groups. Neither of these models adequately represents all of the various information processes involved. The first model confuses activities and types of information sources (steps 1, 2 and 3), while both omit the process of organization and storage of information, and lump together two other distinct processes, analysis of information and creation of the information product. Choo (1998) described a process model of information management involving six distinct steps: (1) Identification of information needs; (2) Information acquisition; (3) Information organization and storage; (4) Development of information products and services; (5) Information distribution; and (6) Information use. This model can be adapted slightly to illustrate the distinct nature of information processes inherent to CI. The word "intelligence" suggests that some form of sense-making takes place during the CI cycle to add value to information. Thus, an analysis process is necessary to transform information into intelligence and must be added to the model. We also decided to omit the final step, information use, because the use of intelligence is beyond the scope of CI. No system can guarantee that the information will be used and will result in actionable strategy, which is the main purpose of CI. Taking this into account, the CI cycle has the following processes and each one entails various manipulations of information.



Information Needs Identification

A prerequisite of any information system is the identification of user needs (who), the type of intelligence that is required (what), and a way for information needs to be aggregated (how). Finally, it is essential to translate the intelligence needs into information needs.



Information Acquisition

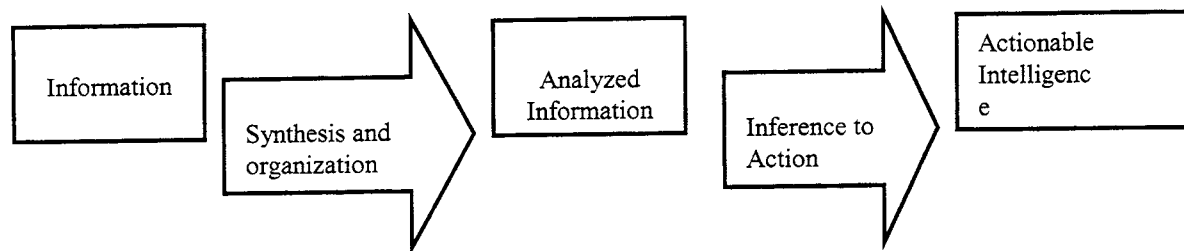
A thorough approach to the acquisition of information for CI requires not only the identification of relevant internal and external sources of information but also the use of two different strategies. The first, a targeted strategy, retrieves specific pieces of information previously identified. The second, a monitoring strategy, regularly scans the external environment for pieces of information that may be of import, but not previously identified by the targeted strategy (Pollard 1999).

Competitive Information Organization and Storage

Once the information has been acquired, it must be organized and stored. This part of the CI process has typically not been addressed in the management literature, and has often been the domain of librarians. Yet, it is a very important part of the CI cycle, and one in which software can play a significant role. The organization and storage process is linked to almost all the other processes in the CI cycle because its quality will have an effect on them given the ongoing need for later retrieval.

Information Analysis

Analysis is the process that transforms information into intelligence. However, this manipulation must tell a story, it must have strategic importance. CI analysis not only involves the synthesis of information but also an inference drawn from that synthesis.



There are many analytical management techniques for synthesizing information: SWOT, benchmarking, or cost analysis, and it is very important to identify which one is required at the beginning of the CI cycle. Each technique provides the company with a different snapshot of their competitive environment and has its own set of information requirements. The final outcome of CI analysis should be recommendation for action, a step still exclusively performed by humans (Fuld & Co 2000).

Intelligence Presentation

The packaging of information products can be just as important a process in the CI cycle as any of the others processes. Depending on the audience and the nature of the intelligence, one report format may be more effective than another. An effective CI system should provide flexibility and a range of product packages.

Intelligence Distribution

Distributing the intelligence to those who need it is the final process in the competitive intelligence cycle. This step often requires the dissemination of information to various individuals within the organization, at various stages of the process, and with varying degrees of detail—getting the right information, to the right person, at the right time (Choo 1998). The key issue is making sure that all those who could benefit from the intelligence are provided access to it in an efficient and timely manner. A number of channels may be used to distribute competitive including face-to-face conversation, telephone, email, and posting on the company Intranet.

Selection of software packages

Fifteen software applications claiming to perform a competitive intelligence function were identified through a perusal of CI intelligence resources provided by organizations, such as the Society for Competitive Intelligence Professionals and private industry, such as Fuld & Co., and through a more general Internet search. Only those packages that seemed to perform at least two steps of the CI cycle including some level of analysis were included in our evaluation. A large number of the software packages were excluded on this basis, since they either did not perform any type of analysis, or performed only one step in the CI cycle. Of the packages remaining, distributors were contacted to obtain an evaluation copy. In some cases, the companies were not interested in providing us with a copy, or simply did not reply. Three packages were selected and examined: *Strategy!*, *ProClarity* and *Wisdom Builder*.

Evaluation Criteria

A short list of criteria used to evaluate general software applications was compiled: ability to fulfill purpose; interface design; compatibility with hardware and other software; technical expertise required; and usefulness of help facility. The criteria dealing with the ability to fulfill purpose using the CI model above were greatly expanded, with value-added processes as defined by Taylor (1988) in mind. Below are the criteria, grouped according to the information process they are related to, and according Taylor's user information selection criteria, with their potential value-added dimensions assigned:

I. Information needs identification

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|---|--|
| 1. Identification of main user group | <i>adaptability – closeness to problem</i> |
| 2. Help for information needs identification | <i>noise reduction - selectivity</i> |
| 3. Recommendations for collecting CI information | <i>noise reduction - selectivity</i> |
| 4. Appropriateness of recommendations | <i>quality - comprehensiveness</i> |
| 5. Capability for changing information requirements | <i>adaptability -flexibility</i> |

User criteria

II. Information acquisition

- | | |
|---|--------------------------------------|
| 1. Ease of use of the information addition capability | <i>ease of use - interfacing</i> |
| 2. Help for information source identification | <i>noise reduction - selectivity</i> |
| 3. Help for development of acquisition strategies | <i>noise reduction - selectivity</i> |
| 4. Capability for document importation | <i>adaptability – flexibility</i> |

III. Competitive information organization and storage

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|------------------------------------|---|
| 1. Storage of a variety of formats | <i>adaptability - flexibility</i> |
| 2. Indexing | <i>noise reduction- intellectual access</i> |

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|--|--------------------------------------|
| 3. Internal search facility | <i>noise reduction - linkage</i> |
| 4. Functional and logical links | <i>noise reduction - linkage</i> |
| 5. Usefulness of the search facility | <i>quality - accuracy</i> |
| 6. Storage of analytical results for later retrieval | <i>ease of use - physical access</i> |

IV. Information analysis

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|--|------------------------------------|
| 1. Performance of some level of analysis | <i>noise reduction - precision</i> |
| 2. Level of analysis performed | <i>quality - comprehensiveness</i> |
| 3. Variety of analytical techniques | <i>quality - validity</i> |
| 4. Usefulness of analysis for CI function | <i>quality - validity</i> |
| 5. Provision of recommendations for action | <i>quality - validity</i> |

V. Presentation of intelligence

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|---|---|
| 1. Variety of formats for viewing CI | <i>ease of use - formatting</i> |
| 2. Effectiveness of formats | <i>quality - validity</i> |
| 3. Flexibility for adapting intelligence products | <i>adaptability- flexibility</i> |

VI. Distribution of intelligence

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|--|--------------------------------------|
| 1. Capability for distributing intelligence products | <i>ease of use - physical access</i> |
| 2. Identification of intelligence consumer | <i>ease of use - ordering</i> |

Other criteria

- | | |
|---------------------------------------|-----------------------------------|
| 1. Ease of use of interface | <i>ease of use - interfacing</i> |
| 2. Capability for changing display | <i>adaptability - flexibility</i> |
| 3. Navigation features | <i>ease of use - browsing</i> |
| 4. Software compatibility | <i>adaptability - flexibility</i> |
| 5. Requirement of technical expertise | <i>ease of use - interfacing</i> |
| 6. Usefulness of help facility | <i>ease of use - interfacing</i> |

Although costs and time savings would be other important criteria to use, we did not retain them since their evaluation would required user studies which were beyond the scope of the present study.

Evaluation

Given the space limit only the detailed evaluation of the first process "Information needs identification" is provided followed by a brief comparison of the packages. A quantitative rating for each application is also presented.

Process I - Information Needs Identification: Strategy offers no mechanism to identify the intelligence consumers or their intelligence needs. However, it provides a lot of guidance to users as to what kind of information needs to be collected in order to perform CI. This is done in two ways. First, the help facility describes the Strategic Planning process in detail and offers several examples of intelligence products. And second, the basic information

needs are outlined by field names in the database. These include the broad topics of *Companies, Products, and Industry* which are then broken down into sub-categories (e.g. the topic *Companies* comprises *Our company, Direct competitors, Substitute product providers, Potential entrants into the industry, Customers, Suppliers*). These are then divided up into even more specific areas. For example, *General company information, Capabilities, Goals, Strategy, Assumptions, Response Profile for competitors; Threat of substitution for substitute product providers; Entry barriers for Potential entrants*, etc. Each of these areas has its own interface, where fields demand very specific pieces of information or data to be added. This information can be used in numerous CI analysis techniques such as personality profiling, benchmarking, cost-analysis, etc. The information chosen is highly relevant. Although the fields cannot be changed, the software provides several unassigned fields. ProClarity does not offer a way of identifying CI consumers or their information needs. Because this software may be used for a number of different business intelligence applications it provides almost no guidance as to what types of information are required for CI. ProClarity requires the input to be in the form of numerical data. The software is sold with a developer guide. This allows for maximum flexibility in that the software can be tailored specifically to needs of the CI consumer. The field names may be changed by the developer if needed. Wisdom Builder does not offer a facility to identify CI consumers. However, it helps users to identify information needs. The software breaks the CI process into 4 phases: requirements, collection analysis, and reporting. The requirement phase prompts users to list their information requirements which may be added, updated or deleted at any time. Strategy outperforms the other two packages in this category. The database fields define the CI information needs for the user in a very comprehensive way, while still leaving room for the user to add other information that they deem as relevant. Wisdom Builder performance is slightly below Strategy since it does not outline what information should be acquired, but it does require users to go through the process of identifying information needs for the analysis. This may help the user ascertain and refine their research requirements. ProClarity offers no facility within the software for identifying information needs. The initial developer of the software must complete this process before it can be used. This does allow the user a maximum of flexibility in assigning fields for a given company intelligence needs.

Process II- Information Acquisition: None of these software packages offers much support for the acquisition of information process. All packages allow for information to be imported from a spreadsheet format, otherwise they require manual, or cut and pasted text. Strategy offers a repository for previously used sources in its Source Information screen.

Process III - Competitive Information Organization and Storage: All of the software packages arrange information hierarchically, according to categories. Both Strategy and Wisdom Builder also link functionally and logically related items but ProClarity does not. Strategy provides the most comprehensive indexing. It stores information in either small text files, or Excel files, Wisdom Builder stores information in a wide variety of formats, and ProClarity stores information exclusively in Excel files.

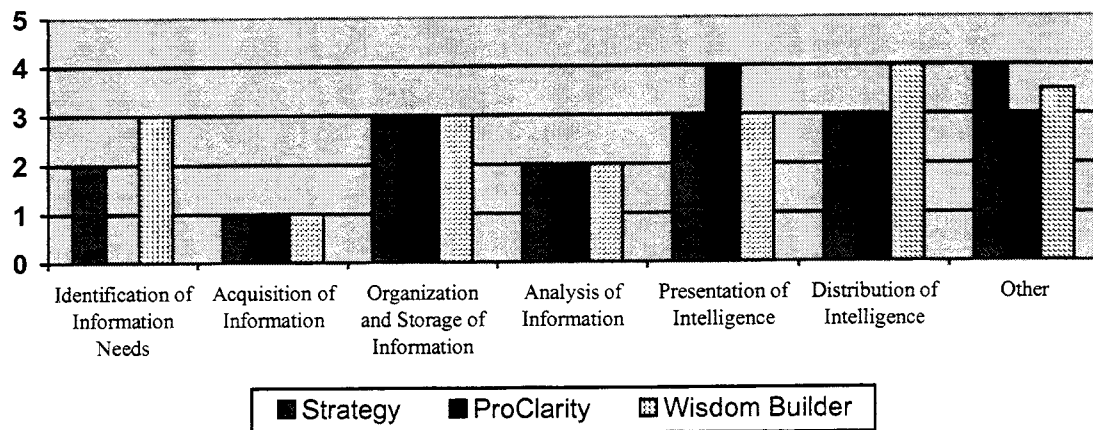
Process IV- Information Analysis: Each of the software packages performs basic analysis techniques. These consist of grouping related information, and identifying trends. Both Strategy and Wisdom Builder require that the user have the ability to correctly index incoming information, thus relationships are created by the user as the information is being added to the databases, and not by the software. Strategy compares many characteristics of a company and its competitors. ProClarity allows the user to choose a number of different variables and compare a company's performance with its competitors on the basis of ratios and measurements attached to those variables. Wisdom Builder creates relationships between pieces of information, based on documents containing keywords. Each of the types of analysis used by the three software packages is relevant to the competitive intelligence process. However, one type of analysis is never sufficient when performing CI. None of the packages make strategic recommendations to the CI consumer.

Process V - Intelligence Presentation: All software packages provide a facility for creating reports. Users of ProClarity can create the widest variety of visual representations of the analysis. Strategy can represent analysis in graph or text format, and Wisdom Builder represents analysis in just text format. Several report designs are available using Strategy and Wisdom Builder, but the former offers the greatest flexibility to the user when choosing content for a report.

Process VI- Intelligence Distribution : Wisdom Builder is the only application where reports can be emailed directly to CI consumer. None of the packages provides support for identifying intelligence consumers, or a repository of intelligence requests.

CONCLUSION

Although the software packages differed substantially, the evaluation highlighted some similar performance capabilities. As shown in the graph below, all of the packages rank poorly in the earlier processes of the CI cycle. Both the identification of information needs and the acquisition of information processes were not well performed.



ProClarity basically ignores both of these processes, while Strategy predefines the user's information needs for them, but offers no function for acquiring the information. Wisdom Builder offers an initial phase requiring users to assess their information needs, but also provides no way of identifying sources or acquiring information. On the other hand, the packages scored fairly well in the later processes of the CI cycle. They all offer numerous report formats for packaging the intelligence, and provided several channels through which it may be distributed. None of the software packages are able to perform any type of sophisticated analysis but perform analysis by merely identifying relationships between variables or providing a number of formats for comparison of different variables. These relationships, for the most part, are created by the users themselves while entering the information into the package, and therefore, little value-added analysis is actually performed. Also, all of the packages fall short of supplying recommendations for action to a strategic planning department. The value of CI is now widely acknowledged in North America, however, the concept of CI is still ambiguous and the value-added processes of CI technology are not entirely satisfactory. If the evaluation is indicative of the market, CI software packages are still far from performing CI from beginning to end. While many producers claim to offer CI solutions, these applications are often only able to perform well one or two steps in the CI cycle. At the moment, they can support CI activities but their potential to add value remains limited.

REFERENCES

- Atkinson, Ross. 1996. Library functions, scholarly communication, and the foundation of the digital library: Laying claim to the control zone. *The Library Quarterly* 66 (3): 239-265.
- Carney, D.J., Wallnau, K.C. 1998. A basis for the evaluation of commercial software. *Information and SoftBare Technology* 40 (14): 851-860.
- Choo, Chun Wei. 1998. *Information management for the intelligent organization: The art of scanning the environment*. 2nd edition. Medford, NJ: Information Today.
- Fuld, Leonard M. 1995. *The new competitor intelligence*. Toronto, ON: John Wiley & Sons.
- Fuld & Company. 2000. *Intelligence software: Reality or still virtual reality?* Cambridge, MA: Fuld

& Co.

- Kahaner, Larry. 1996. *Competitive intelligence: how to gather, analyze, and use information to move your business to the top*. New York, NY: Touchstone.
- Pirttila, Anneli. 1998. Organizing competitive intelligence activities in a corporate organization. *Aslib Proceedings*. 50 (4): 79-84.
- Pollard, Andrew. 1999. *Competitor Intelligence*. San Francisco, CA: Financial Times Professional Limited.
- Porter, Michael. 1980. *Competitive strategy: Techniques for analyzing industries and competitors*. New York, NY: Free Press.
- Richards, T. 1995. A comparative evaluation of four leading CD-ROM retrieval software packages. *Computers in Libraries* 15(4):. 70-75.
- Sieverts, E.G., Hofstede, Martin. 1994. Software for information storage and retrieval tested, evaluated and compared: Part 7—What to choose, or the purpose of it all. *The Electronic Library* 12 (1):21-27.
- Society of Competitive Intelligence Professionals (1999) *What is CI?* Alexandria, VA. <
<http://www.scip.org>>
- Sutton, Howard. *Competitive intelligence*. New York, NY: Conference Board, Inc., 1988.
- Taylor, Robert S. 1986. *Value-added Processes in Information Systems*. Norwood, NJ: Ablex Publishing Corporation.