

# Information Behavior of Competitive Intelligence Professionals: A Convergence Approach

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## Abstract

Competitive intelligence activities are intensive information behavior. This paper reports a portion of results from a study of how 28 Canadian CI professionals work in the real world, such as the mechanism of their information needs, the types of information that they seek, and the information sources that they use.

## 1. Introduction

Competitive intelligence (CI) can be seen as a process by which an organization legally gathers, analyzes and distributes the information about its competitive environment. Although it is well recognized that information seeking and manipulation is an essential feature of CI, it has rarely been studied from human information behavior (HIB) perspective. Rather, CI is conventionally discussed in the literature of business and management. The literature however, often talks about CI at a high, conceptual level, without reference to actual, specific work activities. There is a lamentable amount of adequacy and continuity in the provision of empirical data on what CI professionals do.

From the information behavior point of view, Case (2007) has identified more than 160 empirical studies with regard to HIB in workplaces. A wide range of occupations have been studied, such as engineers, entrepreneurs, journalists, lawyers, managers, nurses, physicians, scholars, securities analysts, etc. It is essential to note that most of the stu-

dies are “source oriented” – concerned with how these populations use information sources and channels. Few studies have probed what people do with information after it is acquired.

This study is among the first attempts that explicitly connect CI with HIB, exploring how CI professionals seek and manipulate information and transform information into intelligence.

## 2. Information behavior

As a research field, HIB focuses on how people need, seek and use information to live their lives. Since mid-1980s, this field has become a core in the information science literature (Julien and Duggan, 2000). Wilson (2000, p.49) defined HIB as “the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use”. Quite often, the term HIB is interchangeably used with other terms, such as “information behavior” (Fisher et al., 2005; Case, 2007) or “human information seeking” (Choo et al., 2000).

Choo et al. (2000) stated that HIB has three components: information needs, information seeking, and information use. *Information needs* are often discussed at the cognitive level – “gaps or anomalies in the state of knowledge or understanding ... represented by questions or topics” (p.3). In an organizational or a work setting, information need often arises when people are involved in such tasks as planning and decision making. *Information seeking* refers to a “purposive, goal-oriented” process to search for information to satisfy a certain need. One prominent concern for research in information seeking is how people deal with the sources or channels of information. *Information use* can be seen as the flip side of information need. It “occurs when the recipient [of the information] processes information by engaging mental schemas and emotional responses within a larger social and cultural context” (p.14). At the individual level, the outcome of information use is a change of his/her “state of knowledge (increase, awareness, understanding of a situation), or a capacity to act (solve a problem, make a decision, negotiate a position)”.

Case (2007, p.5) described that: “information behaviour encompasses information seeking as well as the totality of other unintentional or passive behaviours (such as glimpsing or encountering informa-

tion), as well as purposive behaviours that do not involve seeking, such as actively avoiding information". In his book, *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior*, he selected only *information need* and *information seeking* to discuss. He defined *information need* as a recognition of inadequate knowledge to satisfy a goal, and *information seeking* as a conscious effort to acquire information in response to that knowledge gap.

In addition to the traditional problem-solving orientation, Spink and Cole (2006, p.25) enlarged the scope of HIB to include the "everyday life information seeking-sense-making" and the "information foraging", because they thought that the conventional problem-solution approach to HIB might be insufficient. They broke down HIB into three subsets: *information seeking*, *information organization*, and *information use*. While the *information seeking* and *use* are defined quite similarly to Wilson's (2000), the *information organization behavior* is defined as "the process of analyzing and classifying materials into defined categories".

In the broadest sense, Fisher et al (2005, xix) defined HIB as "how people need, seek, manage, give, and use information in different contexts". They collected and compiled 72 meta-theories, theories, and conceptual models to discuss various aspects of HIB, such as how people seek and use information for problem solving (Wilson, 1999), for uncertainty decreasing (Kuhlthau, 1993), for sense-making (Dervin, 1992), or for foraging (Pirolli and Card, 1999).

One reason for us to incorporate information behavior approach into this study is that we see CI as intensive information work. Many CI scholars have pointed out that effective CI often depends on the ability to identify proper intelligence needs, the types of information that can be used to address the needs, the sources and channels to secure the information, and the methods to convert the information into intelligence (Abels and Klein, in press ; Bouthillier and Shearer, 2003 ; Fleisher and Blenkhorn, 2001 ; Fleisher and Bensoussan, 2007 ; Vibert, 2004). These aspects are highly relevant to the components of information behavior research – *information needs*, *information seeking*, and *information use*. Therefore, those HIB theories may provide an interesting reference framework to explain phenomena in CI.

### 3. Competitive intelligence professionals

CI professional is a general, vague concept, and is still evolving. The CI literature rarely provides a well-established definition of the concept. Instead, some descriptions about CI professionals can be found in publications (e.g., survey results, annual reports, etc) of the Society of Competitive Intelligence Professionals (SCIP), which is a trade association based in North America. According to these publications, CI professionals usually work in a large organization, have a graduate degree, and are equipped with multiple years of industry experience.

Sutton (1988) found that, in a given organization, CI professionals usually had a planning, marketing, sales, or marketing research title, and very often, they were at the rank of manager or analyst. The Competitive Intelligence Foundation (2006) found that CI professionals were often located in a stand-alone CI unit, marketing or market research department, strategic planning department, information center, business development or mergers and acquisitions department.

Fuld (1995) classified CI professionals into three broad categories: data collector or librarian, data analyst, and CI or project manager. Similarly, Bergeron and Hiller (2002, p.369) divided "CI specialists" into two general groups: information specialists and analysts. They assumed that an information specialist should primarily focus on the information management, while an analyst should mainly concentrate on "synthesis, hypothesis creation, assumption building and testing".

For the purpose of this study, the term "CI professional" refers to those individuals who are directly involved in CI processes as part of their major job responsibilities in a corporate or a government agency context. They may be scattered in various departments in a given organization, and may hold varying job titles.

## 4. The Study

### 4.1 Research question

One purpose of this study is to identify a number of CI professionals and provide a descriptive understanding of their actual daily work activities from the information behavior perspective. An overarching research question guides this study: what do CI professionals do? Conventionally, CI activities are des-

cribed in a general, composite manner – collecting, analyzing, and disseminating information. These classical verbs merely delineate certain vague objectives of activities, not the process of how these objectives are fulfilled. This study examines these processes closely.

#### 4.2 Conceptual framework

To achieve the research goal, we use Bouthillier and Shearer's (2003) Information Processing Model of CI Cycle as a conceptual guide (see Figure 1). This model conceptualizes the CI process from an HIB perspective. It includes six basic steps, and each step can further be broken down into subprocesses:

Figure 1 Information Processing Model of CI Cycle



(1) Identification of CI needs (identification of main CI client communities, identification of intelligence needs, identification of CI analysis techniques, and translation of intelligence needs into information needs);

(2) Acquisition of competitive information (identification of relevant internal and external sources, conducting an internal information audit, monitoring information sources, targeting specific information, filtering out information content, and assessing the validity and value of information);

(3) Organization, storage and retrieval (indexing incoming data, information and intelligence);

(4) Analysis of information (synthesis and organization of information, making inferences of the analyzed information to produce actionable intelligence)

(5) Development of CI products (packaging and delivery); and

(6) Distribution of CI products (selection of channels and dissemination)

#### 4.3 Research Participants

It was challenging to identify and recruit participants for this study, in particular, given the ambiguity attached to the concept of CI professional. Another matter is that CI professionals are often behind the scene, and wary of being publicized (Ganesh et al, 2003). In the CI literature, the most frequently mentioned method to identify them is to use the resources at SCIP. It is often premised that members of SCIP would most probably be CI professionals.

In this study, we took this same approach, but supplemented it with more channels, including a snowball technique, that is, key informants sometimes recommend names in their community of practice to the investigator during interviews (Ganesh et al, 2003).

The basic procedures for recruiting the participants are as the following. First, a list of 84 potential participants across Canada was compiled. The names (as well as their contact information) were identified from a number of directories and publications (both electronic and print) available in the CI community. Secondly, each individual on the list was contacted by email with an attachment of an invitation letter. In the letter, the individual was invited to participate in this study, and the purpose and the basic procedures for this project were clearly stated. Thirdly, after the initial contact, if no any feedback was received within one week, a follow-up email or phone call was made.

In the end, 24 individuals on the list agreed to participate in the study. Besides, four other participants were recruited through the snowball technique. So altogether, 28 individuals participated in the study.

The participants were from 24 different organizations across Canada. A majority of the organizations are large, for-profit corporations or firms in various industries (20 out of 24), whereas three are government agencies and one is non-for-profit organization.

Table 1 Job Positions of the Participants

| ** | Job Position                                   | Industry            |
|----|--|---------------------|
| 1  | Strategic Competitive Intelligence Coordinator | Government services |

|         |  |                        |
|---------|--|------------------------|
| 2       | Information Manager, Corporate Affaires                                | Manufacturing          |
| 3       | Researcher, Corporate Affaires   | Manufacturing          |
| 4       | Associate Director/Senior Analyst, Planning and Institutional Analysis | Higher education       |
| 5       | Competitive Intelligence Specialist/Market Research Specialist         | Pharmaceutical         |
| 6       | Manager, Information and Knowledge Management                          | Pharmaceutical         |
| 7       | Associate, Market Intelligence   | Pharmaceutical         |
| 8       | Manager, Competitive and Business Intelligence                         | Information technology |
| 9       | Head, Competitive Intelligence   | Pharmaceutical         |
| 10      | Manager, Benefits Strategy and Analysis                                | Healthcare             |
| 11      | Manager, Business Intelligence   | Professional services  |
| 12      | Manager, Competitive Intelligence                                      | Financial services     |
| 13      | Information Scientist,   | Pharmaceutical         |
| 14      | Information Specialist, Information and Knowledge Management           | Pharmaceutical         |
| 15      | Manager, Market Intelligence   | Professional services  |
| 16      | Associate Director, Competitive Intelligence                           | Telecommunication      |
| 17      | Group Leader, Competitive Technical Intelligence                       | Government services    |
| 18      | Market Research Analyst  | Government services    |
| 19      | Senior Analyst, Corporate Development                                  | Manufacturing          |
| 20 & 21 | Information Resource Analyst, Resource Library                         | Financial services     |
| 22      | Senior Analyst, Strategy and Competitive Market Research               | Financial services     |
| 23      | Manager, Market Strategy and Competitive Intelligence                  | Financial services     |
| 24      | Senior Business Analyst  | Telecommunication      |
| 25      | Manager, Strategic Intelligence  | Aerospace              |

|    |                                       |                    |
|----|---------------------------------------|--------------------|
| 26 | Strategic Advisor                     | Financial services |
| 27 | Associate Director, Business Strategy | Biotechnology      |
| 28 | Director, Business Intelligence       | Energy & Utilities |

(\*\* : Informant code)

#### 4.4 Methods

This study follows a qualitative approach, which comprises interview and diary methods. The research data were collected between December 2006 and July 2007.

First, a semi-structured interview was scheduled and then conducted with each participant. Participants were prompted to describe their daily work tasks and activities with examples. Here are some sample questions:

- How would you describe a typical day?
- What kind of data do you collect?
- What information sources/channels do you use to obtain the data?
- How would you organize and store your data? Any tools?
- After you collect the data, then what is the next? How would you analyze or manipulate them? Any tools?
- What procedures do you follow to produce your product/deliverables?

At the end of each interview, participants were invited to volunteer in a follow-up diary research. If they agreed, they would be asked to keep a structured diary for one working week (five working days).

Fifteen individuals agreed to keep the diary, and 14 completed diaries were returned, because Informants 20 and 21 share one job position and kept one diary. For these diary-keepers, a second-round, post-diary interview was scheduled and conducted to clarify what they recorded in the diaries.

To analyze the data, all the interviews were transcribed. The transcripts and the diaries were then thoroughly read and coded. The condensed data were subsequently categorized and compared. Descriptive statistics were compiled. Various flowcharts were drawn up. Through tables and diagrams, linkages between those emerged concepts and themes were built or collapsed, and plausible explanations to the results were inferred.

## 5. Results and discussion

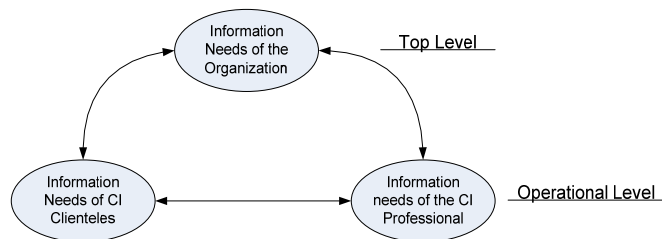
In this section, we will report some results of this study, in terms of information needs of the participants, the types of information sought by the participants, the information sources used by the participants, and some information processing methods and strategies.

### 5.1 Information needs

In many conventional HIB studies, information needs are examined from an individual's perspective, concerning one person's anomalies in his/her knowledge state (Choo et al, 2000). When an information need arises, questions are posed, and the individual taps available information sources. After the questions are answered, the cognitive need is satisfied, the individual's anxiety falls. In short, it is assumed that the need is started internally from the individual himself, and the information is readily available some place.

Interestingly, for participants in this study, most of their information needs were NOT from their personal level, but from the needs of their organizations and clientele. This kind of situation occurs in other environments, such as schools and universities where information needs are imposed on students by teachers. But uniquely, the information that these participants sought was often NOT readily available yet – they had to develop by themselves based on bits and pieces of vague clues and concepts. One participant (Informant 23) observed that “I am not just collecting bits of information. I have been looking for insights”.

Figure 2 Multi-dimensional Information Needs of the Participants



As illustrated by Figure 2, the information needs of the participants have multiple dimensions and a top-down structure. At the top level, information needs occur when the organization necessitates scanning the competitive environment in order to reduce the uncertainty. At the operational level, the

organizational needs are transformed into personal information needs of various CI clienteles, such as top management, executives, line managers, etc. The clienteles send their requests to those CI professionals, who are supposed to be responsible for fulfilling these information needs. The CI professionals receive the requests, and translate them into specific “information requirements”. When these specific needs are satisfied, so are the needs of their clientele and the organization. At the outset, the mechanism is reaction-oriented. As the reactive system constantly reiterates, some repetitive requests become predictable or patterned, and the system tends to be proactive. Thus sometimes, even without request stimulation, when CI professionals realize something important, they will spontaneously send out alerts. But again, the roots for these proactive efforts can be traced back to the information needs of the CI clientele and the organization.

Given the information service nature of CI practice, it is legitimate to postulate that CI professionals actually play an AGENT role to seek information for others. It does not mean that they do not have their own information needs. Rather, during the information seeking and manipulation process, they do generate needs for information to accomplish specific tasks, but the bulk of the needs are evolved from the organization and their clientele. They often serve as an information chauffeur or an internal consultant. Consistently, during the study, the following words and phrases were found repeatedly used among the participants: “organization”, “organizational goals” “information needs of the company”, “what is important for the company”, “firm’s priorities”, “clientele”, “client”, “needs assessment”, “clients’ needs”, “request”, “ad hoc”, “asked me to find”, etc. The data also disclose a variety of CI clienteles, ranging from the top management to line/project managers, and then to other CI stakeholders such as sales representatives, members of a special project team, etc. The clients had diverse information needs, some of which were specific and concrete, but many that were broad and abstract. Here is an example.

Informant 26 was a strategic advisor for at a major financial institution. He once received a request from his EVP regarding “index fund” – a specialized mutual fund based on the stock exchange index. “I got that request by email,” described Informant 26, “it’s just one line with a few words: ‘Can you look at the index fund issue, and give me an overview on that?’” Through more conversations, he clarified what

the executive really needed and finalized a key intelligence topic (KIT) – is it appropriate for his organization to go into the index funds market? Based on this request, he developed a series of specific questions operated as information needs at the personal level:

- What are the main issues for the index fund market?
- What are the opportunities?
- What are the strengths?
- What could be the ways to install index funds in our network: through broker? Or through branches? In what network?
- What about the bottom line of that?
- Is there a risk of cannibalization about our other mutual fund products?"

In his diary, the participant recorded the whole process of how he dealt with the request. The post-diary interview with the participant provides a lot of background information, demonstrating how the information need arose at the organizational level, then at his EVP's level, and eventually operated at his personal level ; and how the knowledge gap initiated a CI seeking and analysis process.

### 5.2 Types of Information Sought

In the study, we asked our participants: "What types of information do you seek and collect in your daily CI practices"? In reply to the question, many participants pointed out that often times, it was per request based – to a large extent, depending on specific situations. Yet, each individual still listed a few enduring types of information that he or she sought. Then a plethora of information types emerged. We collected them all and categorized them by content.

The categorization resulted in a taxonomy with a hierarchical structure of these information types. At the broadest level, these types are divided into two general groups: *information about the competitive environment* and *information about specific competitors*.

Concerning the *information about the competitive environment*, the participants sought and collected the following types of data (in alphabetical order):

#### Analysts' insights

Many participants kept a close watch on various analyst reports regarding industry performance, financial analyses, and future projections. They would like to know and assimilate how the analysts comment about the industry - what the challenges are,

what they like, what they don't like, and the comparisons between various competitors.

#### Awards information

The participants looked for benchmarks or best practices information, so they would like to pay attention to awards information, such as list of awards for trade, for foreign exchange, etc. Such information gave them a good indication of who won what, and why.

#### Business development opportunity information

The participants closely watched their current and potential client companies or business partners, so that when opportunities appeared, they would immediately capture them and act upon them.

#### Deals information

Deals information, according to Informant 11, was the essential type of information that he collected for his law firm. He said that his firm provided services mostly to those high-profile corporate clients. In order to have a better understanding about the competitive environment, they needed to map the relationships between large companies and their law firms. That is why they kept feeding in deals information, so that they could be vigilant to emerging opportunities and threats.

#### Funding information

Informants 5 and 6 were both from research-based pharmaceutical companies, which had opportunities to access government funds to support their drug research and development activities. In the industry, the mechanism is known as "reimbursement plan". Therefore, as part of information requirements, they both kept aware of the information about the reimbursement plan. Informants 17 and 18 both worked for a government agency, which supports scientific and technological research and development. They regularly monitored and collected information about various funding bodies for their information clients. Informant 25 worked in the aerospace industry, which is another capital-intensive field. She tracked funding information from governments regularly.

#### General economic information

These participants collected general economic information to better understand their specific industry. The general information would be combined with other political, social, and technological information, in order to help them understand the general economic context.

### Industry trends information

The participants collected industry trends information, and made sure that their information users were aware of what was going on in the general competitive environment.

### Industry-specific information

Each industry has its own distinct qualities. The uniqueness may generate unique information requirements for the participants to pursue. For example, for Informants 20 and 21, who worked in the insurance sector of the financial service industry, they collected some information that may not be relevant or important to their peers in other industries. The information types included: how people travel (for travel insurance products design team), severity of events (e.g., disasters, bad weathers, etc) around the world, and the cost that will be associated with those events (e.g., the amount of insurance paid out). Another category of industry-specific information reflects the particular information needs of the pharmaceutical industry. Many participants from the industry mentioned that they collected information about physicians, claims, and drug events.

### Key players/opinion leaders information

To inform people about the competitive context, some participants (Informants 5, 7, 10, and 11) tended to look for key players or opinion leaders information. They looked at who the key players or thought leaders were in the field; and what their opinions on something were. A bit different from the "analysts" aforementioned, the opinion leader usually served as an external consultant or advisor, who provided deeper insight on a given topic. Sometimes, the key players were not individuals but organizations. Then they would collect information about what the key organizations were saying about certain things, and cobble that together with other information obtained.

### Merger, acquisition, and divestiture information

The dynamics of the business world are often reflected through industry consolidation. Thus a few participants (e.g., Informants 5, 8, 19, 28) said that one of important types of information that they were seeking was merger, acquisition, and divestiture information. They needed the information to help their organization grasp the industry trends and identify potential business opportunities and threats.

### Mistakes/lessons

Informant 23 was looking for information about big mistakes reported in the industry. She suggested that the information directed her attention to the things that would cost significantly, and the things that her organization could learn.

### Primary market research data

Some of the participants (e.g., Informants 2, 5, 8, 18, and 23) organized primary market research projects to understand their competitive environment. Frequently, they would hire a third-party (i.e., research firm) to administer the projects, but they were actively engaged in preparing protocols (e.g., questionnaire, focus group outline, etc). They worked with the third-party firm to lay down the objectives and identify specific information requirements. Then the research firm would conduct the research and report the results. Once they received the results, they might do some extra analysis upon them.

### Regulations/laws/legal information

Because most of the industries that the participants served for are highly regulated, many of them kept an eye on the information with regard to regulations, laws, and legal positions. Informants 2 and 3 worked for a tobacco company, so they closely watched the regulation information on the tobacco industry. Informant 13 acquired legal data frequently, in order to assess the legal position of his company's drug projects. For Informant 25, who worked in the aerospace industry, one of her responsibilities was to monitor if there was any trade disputes at WTO that involved their competitors.

### Scientific/technological/R&D information

The last subcategory for the competitive environment information that the participants monitored is the information about scientific or technological research. This type of information was mainly collected by those participants who were from the pharmaceutical or biotechnology industries, and governmental services. They monitored and collected the information to support their clients' research and development activities.

Concerning the *information about competitors*, the participants sought and collected the following types of data (in alphabetical order):

### Executive leadership information

The participants systematically collected information about their competitors' executive leaderships. They were watching their leading styles and recent

decisions. Especially, they were looking for information about the changes of executives, trying to answer such questions as: Who is this person? What has he/she done before? What is he likely to do and why did the previous one leave? What will be the impact on the business?

#### Financial performance information

"Financial" is one of the most frequently used terms among the participants. Some of the participants emphasized that, during the earning seasons, they were closely watching their competitors' balance sheets and financial statements. More often, they kept an eye on their competitors' revenues, sales, and market share information.

#### Industry-specific information about competitors

As discussed earlier, some information is tightly bounded to its industry. For example, in the aerospace industry, Informant 25 monitored information about the *orders of deliveries* upon competitors.

Competing in the clinical research outsourcing business, Informant 27 and her colleague made note of the *number of beds* provided by their competitors, which can be interpreted into their research capacity. Also, she looked at competitor information about their equipment, their capability, and what kinds of special populations they can attract for trials.

In the financial industry, Informant 23 looked at competitors' *loyalty rating* information. She was constantly looking for information about benchmarks for client satisfaction, and different attitudes and loyalty of customers.

In the insurance industry, Informants 20 and 21 kept watching *creditor information*, to see what other creditors were doing – their lines of credit, sales, services to home sellers, home buyers, mortgage insurance, etc.

In the energy and utility industry (oil and gas sector), Informant 28 closely monitored their competitors' opinions on *environmental issues*. He was always trying to understand what key messages they wanted to convey to their stakeholders, on the greenhouse gases issue, on the energy conservation issues, etc.

In the pharmaceutical industry, *drug pipeline* data and *molecule information* were the key information types for the participants to seek and collect. They

had to be aware of their competitors' degrees of advancement on any new drug development.

#### Investor relations information

Some participants were particularly concerned about investor relations information, because from there, they could detect some signals for their competitors' future development direction. They went through everything in competitors' investor relations website. Frequently, that is the place where a competitor CEO tells what the strategy will be for their upcoming year. Sometimes, they spent time on listening to their competitors' investor relations presentations.

#### News for business operation

Anything new in terms of business operation was treasured by most the participants. For example, Informant 23 said that she was always curious to grab some new ideas about their competitors' function. Informant 23 said: "When they (competitors) say they trained all their staff in business banking to do this and that, or they added 50 people in this area, or they opened new branches, those kinds of things give me an idea of where they are going. Are they investing in it? Are they ignoring it? Doing everything well?"

#### Products and services information

Many participants sought information about products and services provided by their competitors. They went through competitors' websites, gathering information about their products' names, types, features, etc. Informant 23 said that they needed to understand such questions: what are the competitors offering? How are they offering it? What are the differences between theirs and ours? So they had to be prepared and inform their line managers or sales which competitive advantage they have, and which they lack.

#### Pricing information

Some participants noted that they monitored pricing information based on their clients' requests. But interestingly, Informant 16 said that sometimes, the pricing data just came in to them from other business units. Those business units pushed both competitors' pricing data and their own company's pricing data to the CI team.

#### Strategy information

A few participants mentioned that they needed to acquire their competitors' strategy data, but it was hard to find. Informant 24 provided an example re-

quest : "A marketing team asked us: what are our major competitors' branding strategies, what are the updates about their branding, and whether they are using new media?" To work on that request, they had to employ a number of resources, because the questions were so conceptual.

#### Structure information

Sometimes, a competitor might be undergoing restructuring ; or, there might be changes in an organizational structure of a competitor. Several participants said that they would collect that kind of information to understand how their competitors were enacting these changes and their impact.

#### Staffing/employee information

Somewhat different from executive leadership information, staffing/employee information focuses on a competitor's general workers. Through the data, the participants might be able to infer something about the competitor's capacity and new projects being undertaken. Informant 25 said that they tracked their competitors' staffing information, like their recruiting. Also, they tracked blogs related to the competitors' employees. Informant 27 noted that they monitored the number of employees of their rivals.

Todd (2005, p.199-200) has identified five information intents: (1) to get a complete picture, (2) to get a changed picture, (3) to get a clearer picture, (4) to get a verified picture, and (5) to get a position in a picture. These intents are also useful for describing these participants' information seeking. The *information about the competitive environment* provides the participants with a macro picture of the ecology wherein their companies compete. The *information about their rivals* gives the participants an opportunity to compare their positions against the others'. Nonetheless, these information types suggest that these CI professionals are particularly interested in information about changes in the competitive landscape, so that they can make appropriate adjustment timely.

#### *5.3 Information Sources Used*

Throughout the study, the participants were queried about the use of their information sources. During the interviews, at least one such question was asked. In those diaries returned, the content with regard to the access and the use of information sources was always highlighted, and then discussed with the diary-keepers in the post-diary interviews. These efforts have led to a wide range of information

sources identified, consisting of both interpersonal channels and mass or specialized media.

#### *Interpersonal channels*

In terms of interpersonal channels, 16 individuals out of 28 (57%) explicitly stated that they used human sources to gather information. Others (43%) either responded with "rarely using primary sources" or did not specify if they were using human sources.

Among the 16 participants who explicitly stated that they used human sources, eight individuals stressed that a network of people was of utmost important for their work. The human network is primarily comprised of internal and external human sources.

The internal human sources named by the participants in a large part included (in alphabetical order): business development representatives, colleagues in general, conference/tradeshows goers, customer support staff, executives, field experts inside the company, legal staff, marketing staff, new hires, product managers, project managers, sales representatives, and subordinates. This is consistent with what Case (2007, p.283) has discussed.

The external human sources named by the participants are mainly consultants or field experts outside of the company, and contacts in various government agencies.

While a few participants stated that they usually combined the internal and external human sources for use depending on contexts, many others observed that they much more relied on internal human sources for the sake of security and access convenience.

Regarding access to the internal human sources, many participants were found to use a proactive approach. They talked to various business staff and tried to establish a long-term relationship with them. Some of the participants encouraged their CI stakeholders to construct a social routine to share information. For example, Informants 1 and 13 gather information from those people who went to conferences, tradeshows, or exhibitions. Informant 27 asked those business development representatives and project managers to fill out a client business report form when they visited clients.

Sometimes, new hires were an information source for the participants to tap. Informant 15 described his

experience on that. When he found a new hire who actually came from a competitor, he would call the individual and just walk through a number of different areas, probing from here and there to find out if there was any interesting knowledge of which they had previously unaware. Similarly, Informant 22 depicted her experience in accessing the human sources: "If we have new people hired and they come from another institution, then I usually set up an introduction – a half hour meeting, and ask them some general questions about the company. Once I made that contact, [I keep it] on an on-going basis. [Later] if I have a question, I will just ask them. That is the part which is always very useful".

#### *Mass or specialized media*

Almost all the participants stated that they used a number of secondary information sources, most of which are Internet or electronic based, either in a general or in a specialized genre.

The general sources used by the participants are those comprehensive news media or content providers, such as Factiva, Infomart, Bloomberg, or Dialog. The specialized sources are usually industry-specific. For instance, IDdb3 is a drug pipeline database, which was often used by Informants 5, 13, 27 in pharmaceutical and biotechnological industries; Morningstar provides a wide array of financial information, so it has been used by Informants 12 (mutual funds), 20 and 21 (insurance).

Those secondary information sources can be categorized into three large groups: databases (commercial or non-commercial), websites, and consultancies.

#### Databases

Seventeen participants (61%) stated that they used commercial databases to monitor and collect information. These commercial online services often provide current and archived news, and other types of content. To access the commercial databases, subscriptions are usually needed.

Depending on participants, each of the databases might have a unique use. For example, Informant 3 needed to interact with about 15 databases in her daily work. She used different databases with different purpose: Factiva for global content, Infomart for Canadian content, Eureka for French content, Reuter's Knowledge for merger and acquisition content, QuickLaw for legal content, Sukish for Quebec judi-

cial content, a database provided by Tobacco Merchants Associations (TMA) specialized on tobacco content, etc.

Informant 12 subscribed to three mutual funds oriented databases: the Investment Funds Institute of Canada (IFIC) database, Morningstar and the Investor Economics. These databases were actually the major data sources for her monthly CI products. She downloaded raw data from the sources, and then tabulated them into a Microsoft Access template that she had designed. From there, she could help her executives, marketing and sales teams, and fund managers to see the whole competitive landscape and locate the company's position.

Informants 5, 9, and 13 named several pharmaceutical-specific databases: IMS – that provides sales number and prescription number for various drugs; Pharmaprojects, R&D Insight, R&D Focus, and IDdb3 – these are four investigational drug databases, also known as drug pipeline databases; and clinical databases, which provide detailed information on specific products and their clinical information, as well as market information.

Informant 25 said she used a number of databases, among which two were aerospace-specific. One was used for tracking order and delivery of commercial airplanes. The other one was utilized to track the contracts between suppliers in aerospace. In addition, the informant told that she used another internal, non-commercial database, which was designed and created to house all competitive information.

Likewise, Informant 4 said that his team used various internal data warehouses and external consortiums. These non-commercial databases could help them extract useful information and by nature they were seen as reliable and validated sources.

Conversely, some participants stated that they were reluctant to use or subscribe to commercial databases. They cited two major reasons. First, they had a concern regarding the redundancy issue. Informant 23 assumed that what the commercial databases do was business clipping news service and subscription research report. If they have already had such services in place, why bother? Second, they were not sure about the value that the databases could provide. Informant 27 said that they obtained many free newsletters and used much free content

on the Internet. Comparatively, the commercial databases were costly.

#### Websites

Almost every participant (96%), except Informant 17, has listed some websites that they regularly used for information monitoring and collection purposes. These websites could generally be classified into several groups: companies/competitors, government agencies, associations, and news publications.

The participants closely watched their competitors' websites, where they could update information about leadership, company events, and financial performance (i.e., annual reports). Sometimes, from the company websites, the participants found investor relationship presentations or analysts' conference call information. The websites were also the places where some monitoring technologies were utilized. Informant 16 stated that they used a RSS tool (Newsgator) and some other in-house tools to detect changes in websites that were not RSS compatible. Similarly, Informant 27 found Copernics Tracker a useful tool. With this tool, the informant could know not only what has been added to a webpage, but also what has been removed from it.

Some participants collect information about regulations via government websites. Informant 3 systematically monitored 13 government websites (both at the federal and provincial level) to keep the organization informed about the tobacco regulations and policies. Informants 4, 5, 6, 14, and others kept track of Statistics Canada and Health Canada.

Association websites were another diverse group that reflects differences in industries. But the associations often report industry trends and provide membership research service, so they were seen as important sources for information. Informant 15 was looking at a set of associations, clubs and interest groups, such as the Board of Trade or the Chamber of Commerce, trying to understand what was going on there, or their competitors' presence there. To create her market share analysis, Informant 23 regularly downloaded original data from the Canadian Bankers Association ([www.cba.ca](http://www.cba.ca)) and then put that data into analysis.

News websites that the participants used for information collection include traditional media (i.e., newspaper, magazine, television, etc) and new me-

dia (i.e., blogs, podcasts, discussion groups, listserves, etc). Many participants mentioned that they used online newspapers such as Financial Times, The Wall Street Journal, the Globe and Mail, and others, to understand what the current situation was, or what the presence of their competitors in the press was – who was quoted, and what it was about. Four participants (Informants 16, 20, 21, 25) stated that they kept track of blogs or RSS feed. They used tools like Bloglines.com to search for news update about the industry and competitors.

#### Consultancies

Ten participants out of 28 (35%) overtly stated or suggested that they used services provided by external consultancies. The consultancies included research firms who helped them for primary market research, banks or brokers who provided industry trend reports or investment banking reports, and consulting firms who offered professional services. These reports or services were accessed via subscription or purchase. For example, Informant 5 ordered syndicated or customized reports from Decision Resources ([www.decisionresources.com](http://www.decisionresources.com)), a major research and advisory firm for pharmaceutical and healthcare issues; Informant 26 used studies made by McKinsey or PriceWaterhouseCoopers, two leading professional service providers.

#### *5.4 Information Processing*

According to Bouthillier and Shearer's (2003) model, after the information is acquired, it should be stored and organized properly, so that different data can be easily retrieved and linked to one another. During the study, the participants were asked to describe how they store and organize information collected.

In reply to this question, 24 participants (86%) stated that they used some systematic way to store the information. Three individuals (11%) said that, at the time of the interview conducted, they did not have an efficient way to store the gathered information, but they were all looking for solutions to address the need. One individual (4%) did not provide relevant information.

In terms of the solutions that the participants used, five categories were identified: (1) local database solution (used by 14 individuals), (2) folders on shared drive (used by four individuals), (3) paper files and local repository (used by three individuals), (4) large portal solution (used by two individuals), and (5) CRM database (used by one individual).

Local database solution was the most widely used strategy among the participants. The solution was usually a customized database developed locally by various tools, such as Adobe, eRoom, Lotus Notes, Microsoft Access, Excel and SharePoint, Oracle, Sydney micro library system, etc. It was a usual case mentioned by many participants that they first imported data from other sources, such as commercial databases or self-developed Excel or Word documents, and then the imported data were indexed through categories and thesauruses defined by the participants. Often times, the local database had a web-based interface, but access to it was limited. Many participants used the local solution as a central repository to store, catalogue, and search information. Four participants stated that they did not use a formal database structure to store information. Rather, they established folders on a shared drive internally. The folders were organized in a way for later information retrieval. Informant 16 pointed out that news articles had a short life span, so they tended to analyze news information "on the fly".

According to the participants, the stored information was organized primarily by the following categories: company/competitors, events, products/brand names, projects, studies, ad hoc research requesters, topics (such as therapeutic areas), dates, and analysts. Among them, the most visible organizational method was to classify files by company or competitor.

With regard to approaches to information analysis, these participants provided a lot of qualitative results. These results varied a great deal among one another, and we will report them in another paper.

## 6. Conclusion

This paper gives an overview about CI and its relationship with information behavior research, proposes a working definition of CI professional, and reports a portion of results from a study on how CI professionals work in the real world, such as mechanisms of their information needs, the types of information sought by these information workers, and the information sources used them.

CI furnishes an intriguing lens to understand information behavior. The knowledge gleaned from this study has the potential to reinforce and expand the foundation of HIB, such as the multi-dimensional information needs exhibited by CI professionals.

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