

What Do Competitive Intelligence Professionals Do? A Pilot Study

Abstract: Many people have trouble in conceptualizing what competitive intelligence (CI) professionals do. A systemic research is designed to understand how CI professionals work in real life. This paper reports the pilot phase of the project.

Résumé : De nombreuses personnes ont de la difficulté à conceptualiser ce que font les professionnels de la veille concurrentielle. Une recherche systémique est conçue afin de comprendre comment les professionnels de la veille concurrentielle travaillent dans la vraie vie. Cette communication présente la phase préliminaire du projet.

1. INTRODUCTION

What do competitive intelligence (CI) professionals do? Although there is a consensus that information manipulation is an essential characteristic of CI practice, many people still have trouble in conceptualizing the content of CI work. They often associate it with clandestine images, and ignore the legal distinction between competitive intelligence and business espionage. Additionally, some people assume that CI professionals be corporate librarians, and are reluctant to explore what they really do. More ironically, in either information science or management literature, there exists little comprehensive theory based on empirical investigation of CI tasks and activities.

Hence, a systemic research is designed to understand how CI professionals work in real life and the concrete mechanisms underlying the creation of the intelligence. Three research questions guide the study: (1) Which tasks and activities are CI professionals engaged in their work? (2) How do they go about the tasks and activities? (3) What factors constrain or facilitate the work activities of CI professionals?

The research can be important for a number of reasons. First, theoretically, the outcomes of the study should contribute to the knowledge of human information behavior (HIB). Conventional HIB research puts a lot of emphasis on information seeking, searching and retrieval. Nevertheless, what happens after information is obtained is not well known, yet. CI is an intensive information practice, during which information from various sources is continuously requested, sought, and processed in order to create intelligence – another form of information. It provides a typical example that allows researchers to observe all of the steps of information behavior.

Second, in a practical sense, the outcomes of the research should inform the design of future CI training programs and software applications. As an information service function, CI has been institutionalized in North America for decades. It has been phenomenal that many organizations have established formal CI programs; many universities have offered or are planning to offer CI training program; and a good number of software applications have been developed for CI purposes. However, it is unfortunate that, in essence, we have not yet come to grip with what CI professionals really do. There is a need to address the

ambiguity. Otherwise, how can we teach CI effectively? How can we help design adequate tools for the professionals? And how can we improve CI practices anyway?

Third, from a methodological point view, we have designed a task analysis approach uniquely suited to this research, and the experience in setting up and running this study provides a perspective on how the qualitative approach may add depth and rigor to HIB research.

This paper reports the pilot phase of the project. Five sections follow. First we explain what we mean by “CI” and “CI professional”. Next we briefly revisit some related studies. Then we describe the methodology that we employed. Finally, we present some results, and conclude the paper with a summary.

2. DEFINITIONS

Throughout the text, CI is loosely defined as the process by which an organization legally and systematically collects, maintains, analyzes, and disseminates the information about its competitive environment, in order to derive insights about business trends and maintain its competitive advantage (Bouthillier & Jin, 2005; Fleisher & Bensoussan, 2003). In the academic world, it is not possible to land an agreement over the definition of CI. Here we see it as a generic concept, which may encompass concepts of competitor intelligence, market intelligence, business intelligence, and environmental scanning. But its core is to cope with the competitive environment and to develop something insightful through information manipulation.

By the term “CI professional”, we refer to those who are employed by an organization to practice CI as their major job requirement. They may scatter in different departments (e.g., independent CI program, strategic planning, marketing and sales, research and development) of a given organization, and may hold varying job titles (e.g., CI manager, CI analyst, market research specialist, research analyst, business intelligence analyst). They are identifiable through diverse trade associations, conferences, workshops, or trade publications.

3. RESEARCH SETTING

To lay a solid foundation for the research, we systematically reviewed three bodies of literature. Due to space limitation, we only summarize some key theories or findings here.

3.1 HIB Research at Workplaces

Given the importance of information manipulation in CI practices, research on HIB at workplaces is particularly relevant to this study. Fisher et al (2005, xix) define human information behavior as “how people need, seek, manage, give, and use information in different contexts”. It implies that HIB may consist of three key elements of which are presumably integrated, rather than distinct entities: *information need*, *information seeking*, and *information use* (Bartlett & Toms, 2005). However, probably due to “conceptual difficulties”, many HIB researchers give their concentration to the first two elements, and often leave *information use* without closer examination (Savolainen, 2000, 36).

As a kind of social behavior, HIB is habitually shaped by three levels of dimensions: *cognitive*, *affective*, and *situational* (Choo et al, 2000, xii). Table 1 lists some selected HIB models that may be relevant to the study.

Levels of Dimensions	Models	Source
Cognitive	Sense-Making Fundamental Equation Information Intents	Dervin (2005) Brookes (1980) Todd (2005)
Affective	Principle of Uncertainty and Information Search Model Levels of Information Needs Stress and Self-Efficacy	Kuhlthau (1993) Taylor (1968) Wilson (1997)
Situational	General Model of Information Seeking of Professionals Information Foraging Theory	Leckie (2005) Pirulli & Card (1999)

Table 1 Some Selected HIB Models

At the *cognitive* level, three models are worthwhile for revisiting: (1) Dervin’s Sense-Making, (2) Brookes’ Fundamental Equation, and (3) Todd’ Information Intents. Dervin (2005) uses her Sense-Making model to describe how humans perceive information needs as cognitive gaps: An individual, who moves through space and time, will stop when he/she encounters an unfamiliar situation; to continue the journey, the individual has to seek information and internalize it to bridge the cognitive gap. To date, numerous studies based on the approach have suggested that “the ways in which people perceive their cognitive gaps and the ways that they want information to help are good predictors of their information seeking behavior” (Choo et al, 2000, 4). Beyond information seeking, information processing and utilization also involves a lot of mental activities in the cognitive sense (Wilson, 2000). One classic model is Brookes’ (1980) “*fundamental equation*” ($K[S]+ 'I=K[S+ 'S]$). The pseudomathematical equation attempts to represent what occurs inside the “black box” when an individual continually interacts with information. Cognitive scientists assume that “human knowledge is a constant totality of conceptions”, which are stored within an individual’s mind in the form of “schemes, scripts, mental models or cognitive structures” (Savolainen, 2000, 39-40). An individual’s existing knowledge structure ($K[S]$) can be changed by the selectively received and incorporated information ($'I$), which represents the difference between old and new information; that is, the reception of $'I$ leads to a changed knowledge structure $K[S+ 'S]$, where $'S$ refers to the “effect of the modification” (Savolainen, 2000, 40). Based on that, Todd (2005, 198) develops an “information intents theory”, which provides a framework to understand “what happens in people’s minds when they consume information”. Through a quasi-experimental methodology, Todd (2005, 199) measured people’s existing knowledge about a given domain, the modifications of the knowledge structures when some relevant information was exposed, and the cognitive effects of the modification. The analysis of the measurements was ended up with a theory, which posits that, when people are engaged with information, there might be five intents: (1) get a complete picture, (2) get a changed picture, (3) get a clearer picture, (4) get a verified picture, and (5) get a position in a picture (Todd, 2005, 199-200). The author elaborates: “As drivers and outcomes of information utilization, information intents enable people to move forward in their information endeavors, constructing new pictures that represent new understandings. This is not random acquisition, but one shaped by a desired cognitive intent in the context of individual frames of reference such as personal experience, existing knowledge, and current stage of life cycle” (Todd, 2005, 200)

At the *affective* level, Kuhlthau (1993) describes how *uncertainty* can lead to some affective symptoms, such as *anxiety*, *apprehension*, *confusion*, *frustration*, and *diffidence*. These uncomfortable states guide an individual’s information behaviors. As the information search proceeds, initial anxious feelings reduce and confidence increases. Based on the principle of uncertainty, Kuhlthau (1993) developed her six-stage

information search model: *initiation, selection, exploration, formulation, collection, and presentation*. According to the model, information search is a process by which an individual keeps constructing his confidence through information seeking activities. His *mood* and *attitude* will much influence the range and quality of his search tasks. Similarly, Taylor (1968) proposes a continuum of information needs – *visceral need, conscious need, formalized need, and compromised need*. Wilson (1997) postulates that uncertainty may result in *stress*, and the stress may be lessened when a *self-efficacy* is built.

At the *situational* level, Choo et al (2000) identified a list of factors constraining HIB, including subject matter, goal clarity and consensus, magnitude of risk, amount of control, professional and social norms, time and resource constraints, perceived information source accessibility, task complexity, uncertainty of the task environment, task structure (rules, routines), organizational culture, and information politics. More than that, Leckie (2005) describes a *General Model of Information Seeking of Professionals*, which aims to study how professionals search for, use and integrate information sources into their work processes. The model set five assumptions: (1) despite their training in a particular area of expertise, a professional often assumes multi-role (i.e., service provider, administrator, researcher, etc) to his/her work position; (2) each of the roles involves a constellation of tasks; (3) because different tasks may represent different situations, they may prompt different information needs and information seeking activities; (4) there are intervening factors (i.e., rules, routine) that may either facilitate or inhibit the finding and use of information for specific tasks, and (5) it often takes more than one attempt to locate what they look for (thus a feedback mechanism may exist) (Leckie, 2005, 159-160). The model suggests that *work roles* of a professional in an organization will play an important part in his/her information activities. Another interesting model related to the situational level is Pirolli & Card's (1999) *Information Foraging Theory*, which exhibits how strategies and procedures for information seeking, gathering, and consumption can be “adapted to the flux of information in the environment”. The theory assumes that people will revise their strategies or the structure of the environment to maximize their possibility in obtaining valuable information. Three sub-models are built to explicate the adaptation process: *information patch models* (dealing with time allocation, and information filtering and enrichment activities), *information scent models* (dealing with relevance and the identification of information value), and *information diet models* (dealing with the selection and pursuit of information items) (Pirolli & Card, 1999, 643).

To date, a considerable number of empirical HIB studies has been done on various professionals. In a chronological order, we summarize a few. In a study of how CEOs scan environment for business trends information, Choo (1993) identified several factors that may influence the information behavior: perceived source accessibility, perceived source quality, task complexity, and personal interest and motivation. It was found that the perceived source quality was far more important than the other factors for the CEOs. Baldwin & Rice (1997) made telephone interviews with 100 top-ranked American securities analysts to explore their information seeking behavior. The results showed that the individual's characteristics (i.e., experience, membership in associations, gender, age, MBA degree) had little influence on their information sources/channels choices and usage. In contrast, Kuhlthau (1999) reported in a longitudinal case study on a securities analyst that experience might speak difference. The observed analyst offered a personal explanation on how his perceptions of his work changed his choices of information sources over time. Beyond the perceived source quality and personal experience, in a diary study on a group of municipal administrators, Bystrom (1999) described how perceived task complexity would play an important role in HIB. Bartlett (2005)

developed a study on information behavior of bioinformatics experts. For the first time, she integrated task analysis approach within a HIB framework. The novel method provided a solid description about how information is adapted and manipulated by expert bioinformatics analysts.

3.2 Research on Intelligence Practices

CI borrows many concepts and information manipulation strategies from traditional intelligence practices. Thus the research literature (both theoretical and empirical) on intelligence practices is also relevant to the study.

In the intelligence community, the *concept of intelligence* can be defined either “as the process by which specific types of information are requested, collected, analyzed, and provided to policy makers”; or “as the products of the process” (Lowenthal, 2006, 9). Physically, intelligence can be seen as something beyond information – a type of self-transcending knowledge (or foreknowledge) that enables its users to foresee the emerging future and the associated contingent arrangements (Scharmer, 2001). It may contain “a body of evidence and the conclusions drawn therefrom acquired and furnished in response to certain perceived situation”; and “it is often derived from information that is concealed or not intended to be available for use by the acquirer” (U.S. Congress, 2002, 429).

The basic *intelligence process*, often known as *intelligence cycle*, includes five steps: (1) planning and direction, (2) collection, (3) information processing and storage, (4) analysis and production, and (5) dissemination (Herring, 1998). The process sounds simple, but its operation is quite complex (Prescott, 1999, 44), because it is often characterized by the use of large amounts of heterogeneous information that is weak, compromised, and enigmatic (Walle III, 2001, 1).

The theoretical base of intelligence practice can be traced to *cognitive psychology* literature on how people make judgments on incomplete and ambiguous information (Heuer, 1999). In general, intelligence practice has been seen as intensive human process. Heuer (1999, xviii) lists three cognitive difficulties that intelligence analysts face:

- “The mind is poorly wired to deal effectively with both inherent uncertainty (the natural fog surrounding complex, indeterminate intelligence issues) and induced uncertainty (the manmade fog fabricated by denial and deception operations).
- Even increased awareness of cognitive and other ‘unmotivated’ biases, such as the tendency to see information confirming an already-held judgment more vividly than one sees ‘disconfirming’ information, does little by itself to help analysts deal effectively with uncertainty.
- Tools and techniques that gear the analyst’s mind to apply higher levels of critical thinking can substantially improve analysis on complex issues on which information is incomplete, ambiguous, and often deliberately distorted. Key examples of such intellectual devices include techniques for structuring information, challenging assumptions, and exploring alternative interpretations.”

Herring (1998) identifies three critical competencies a good intelligence professional should have: (1) subjective knowledge, (2) clarity of thought, and (3) judgment – the ability to arrive at the right conclusion. He argues that the nature of intelligence practice is to identify relevant facts, determine significant relationships, and derive key findings through systematic collection and examination of information (Herring, 1998).

In empirical endeavors on intelligence practices, Montgomery et al (1979) interviewed 117 government/military intelligence analysts and observed their work practices. The study was ended up with a cognitive model of intelligence analysis, which identifies a set of environmental and individual variables that are underlying the cognitive processes. One of major findings of the study is that intelligence analysis is an internal, concept-driven activity, rather than an external, data-driven activity.

3.3 Research on Competitive Intelligence Work

CI has usually been practiced in the business arena, where the *intelligence cycle* is also applicable. Prescott (1999) delineates a general CI cycle (see Figure 1): the process is often initiated through a request from management; the request represents a key intelligence topic, which may be broad and ill-structured; through interactions between CI professionals and the management, an agreement is reached on the parameters of the request; then the collection of information begins; the CI professional collects information through the use of secondary sources, tapping the human networks, and/or conducting primary research; the collected information is then processed and stored; then analysis allows the CI professional to draw conclusions from the information; the conclusions then need to be interpreted to product implications and recommendations for communication or action.

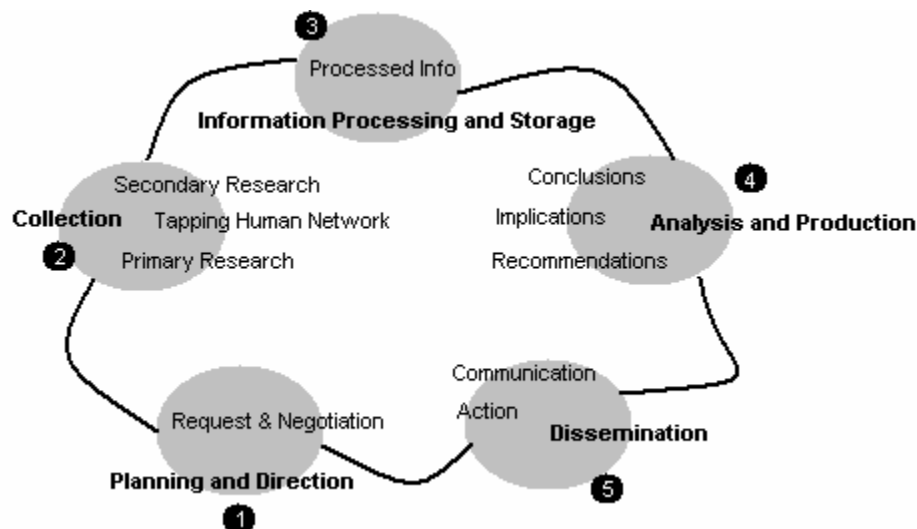


Figure 1 A General CI Cycle based on the Intelligence Process

Bouthillier & Shearer (2003) attempt to conceptualize CI process from an HIB perspective. Based on several established models (i.e., Herring, 1998; Choo, 1998), they proposed an *Information-Processing Model of CI cycle*, which includes six basic steps: (1) identification of CI needs, (2) acquisition of competitive information, (3) organization, storage and retrieval, (4) analysis of information, (5) development of CI products, and (6) distribution of CI products.

As stated earlier, there have been few empirical studies that have been done focusing on CI tasks and activities. Ghoshal & Westney (1991) examined competitor analysis systems in three large companies. They systematically interviewed more than 150 individuals, including CI analysts, CI managers, and internal clients of CI. Three activity clusters of the observed CI analysts were identified: data management, analysis, and implication. When the study was conducted in 1986, data management activities were the most time-

consuming and the least preferred jobs for the CI analysts. Instead, they wanted to have more time spent on analysis activities (synthesis, hypothesis, assumption).

Schultze (1997) used ethnography method observing and describing daily practices of four CI analysts in a Fortune 500 firm in 1995. She identified four roles that CI analysts usually play: (1) value-adding corporate citizen, (2) internal consultant, (3) official broker of business information, and (4) strategic advisor.

Pirolli & Card (1999) reported a study on how a business intelligence analyst prepares newsletters. They identified a series of actions to complete the task, such as scanning trade magazine issues, marking and selecting articles, receiving photocopies of the articles, piling and organizing the articles, skimming the articles, telephoning “various contacts and people suggested by the article”, and etc (Pirolli & Card, 1999, 648). The authors used this example to further strengthen their information foraging theory.

Competitive Intelligence Foundation (2006, 1-10) conducted an online survey to CI professionals globally. Over 500 individuals representing about 12 industries responded. The survey generated some interesting findings: (1) CI is often conducted by people who work part-time on CI; (2) in an organization, CI is often placed as an independent unit or as a part in marketing or market research department; (3) CI professionals rarely concentrated on only one component of the intelligence cycle; (4) CI professionals create and distribute a variety of products or deliverables, and the most common products are company profiles, competitive benchmarking, market/industry audits, and early warning alerts; (5) CI professionals use a variety of primary and secondary information sources, while the most cited primary source is company employees, the most cited secondary source is publications (print and online); (6) the mostly used CI analysis approaches are competitor analysis and SWOT (Strength, weakness, opportunity, and threat analysis); (7) CI products and deliverables are distributed to a wide and diverse internal audience; (8) a variety of technologies are used by CI professionals, and email is the most common way to deliver information and analysis.

4. METHODOLOGY

4.1 Task Analysis Approach

Task analysis (TA) is a research strategy that will enable researchers to capture, analyze and articulate how people go about their business (Jonassen et al, 1999, 3; Kirwan & Ainsworth, 1992, 1). It has been widely applied in various job analysis, ergonomics, instructional design, and psychotherapy.

The purpose of TA is to reduce ambiguity in human behavior by scientifically defining the parameters of the situation where the behavior is embedded (Jonassen et al, 1989, 4). The parameters may include goal, component actions, sequence of the components, trigger conditions, and inputs and outputs (Bartlett & Toms, 2005, 471).

We decide to adopt TA as our overarching methodology for two reasons. Firstly, it fits best with the research questions. Secondly, TA is good for behavioral research. In this study, TA is viewed as an overarching methodological framework where different TA-oriented approaches can be integrated, such as cognitive work analysis (CWA) and activity theory (AT) (Jin & Bouthillier, 2006).

Here we see *task* and *activity* as two concepts. They can be different in concentration, but

complementary in usage. By *activity*, we refer to those general actions that CI professionals perform in their work (e.g., meeting). By *task*, we refer to those jobs that are prescribed to/imposed upon a CI professional to do (e.g., to find specific information).

4.2 Data Collection

The purpose of the pilot study was in three-fold: (1) to test the instruments to ensure that they can generate the desired data; (2) to assess the feasibility and utility of the data collecting methods; and (3) to allow a preliminary analysis of the data collected.

The pilot project was conducted between November 2006 and March 2007. The data collection follows five stages: (1) potential participant identification, (2) participant recruitment; (3) semi-structured interview; (4) diary keeping; and (5) post-diary interview.

Before the study was formally unfolded, a list of over 200 potential participants across Canada was identified and compiled. The names were obtained through three avenues: directories, publications, and personal contacts.

Starting from November 2006, we contacted seven CI professionals on the list by email. Three had not responded, and the other four agreed to participate in the study voluntarily.

For the four participants, after their confirmation, the first round of interviews was scheduled and then conducted. The interviews were conducted privately at the participant's working place. Each interview session lasted about one hour. During the interview, participants were prompted to describe their daily working tasks and activities. They were also asked to recall two critical incidents (one positive and the other negative) in their CI career. The structure of the interview is based on a series of "open-ended questions that tend to encourage free-flowing conversations" (Stitt-Gohdes et al, 2000).

During each conversation, we made every effort to establish a rapport with the participant. In concluding each interview, we invited and encourage the participant to continue to involve in the next part of the project – diary research. Among the four participants, three volunteered in the diary part. They were asked to keep a diary for one working week. A structured diary form which has been preloaded in a Microsoft Word® document was sent to the diary keepers. At their conveniences, the diary keepers could choose any one-week that they think typical of their working. Once a diary was completed, the diary keeper returned it back to us through email, and a post-diary interview was scheduled. Then the content of the diary was examined thoroughly so that we could generate some new, specific questions for the post-diary interview.

The aim of post-diary interview was to clarify some responses that the diary keepers made in their diaries. During the interview, we reviewed the content of the diary together with the participant and asked for more details of some events, processes, perceptions and experiences described in the diary.

The pilot study generated a data set, which includes more than seven hours of audio recording of interviews, three returned, complete diary entries, and multi-pages of field notes. In addition, our participants provided us with approximately 200-page printed documents as supplemental data, including sample reports, screen snapshots, working manuals, and organizational charts.

A preliminary analysis of the data was done by transcribing the interviews, by initially

encoding the data, and by writing analytical memos (Neuman, 2006).

5. PRELIMINARY RESULTS

Four individual CI professionals from three organizations participated in the pilot project. Table 2 outlines their profiles. Although they came from different industries, one thing in common is that they are all part of a CI unit whose mandate is to manage the information about the external environment.

Professional	Organization	Industry	Sector	CI Experience	Gender	Age
A	Company 1	Public Health & Prescription Drug Insurance	Public	10 yrs	Female	55+
B	Company 2	Tobacco	Private	12 yrs	Male	36-45
C	Company 2	Tobacco	Private	5 yrs	Female	46-55
D	Company 3	Higher Education	Public	6 yrs	Male	46-55

Table 2 Profile of the Participants

5.1 Work Tasks and Activities

The collected data reveal a great diversity of working tasks and activities in which the four CI professionals are engaged. For each individual, there is a unique representation of her/his responsibilities and activities entailed.

Professional A is a CI coordinator, who works for a government agency, which administers public health and prescription drug insurance plans in a Canadian province. She leads a CI unit, whose mission is to maintain a continuous environmental monitoring process, in order to alarm chief officers of the organization potential risks and opportunities. Professional A's work involves various activities and tasks: (1) to identify, trace, monitor, and analyze key intelligence issues/topics, (2) to prepare, write and edit research reports/briefs to satisfy her clients' regular and *ad hoc* information needs, (3) to edit two monthly newsletters, (4) to train team members with CI skills. Uniquely, in the organization, she is the only full-time CI professional. Although there are 15 other people in her CI unit, they are selected from various departments, and only work two days on CI every month. Therefore, she has to make a lot of coordinative efforts to keep the horizontal, decentralized structure functioning.

Professional B and C work in a same tobacco company. Professional B is an information manager at its Corporate Affaires Division. He supervises an information unit, whose responsibilities are: (1) to manage a corporate information center, which is mandated to keep watching the competitive environment of the company; (2) to audit, from an informational perspective, the company's business practices and corporate behavior, in order to find a way to improve the operation of the company; and (3) to provide public consultations about the philosophy of the company to various stakeholders (i.e., retailers, employees, suppliers), and at the meantime, to understand their needs and expectations and then feed the information back to the company. Thus, it is salient that Professional B does a lot of traveling and interactions with various people, both internally and externally. Furthermore, an important task for him is to organize primary market research projects (i.e., focus groups, public opinion survey). His work is characterized by dealing with a lot of human information sources.

In contrast, the work of Professional C is characterized by emphasis on dealing with secondary information sources. Quite often, she has to handle many specific information

requests. She is a researcher, who reports to Professional B. Her major jobs can be split into two: (1) to monitor the competitive environment of the company; and (2) to answer information requests from all departments of the company. To keep close watch of the environment, she needs to process averagely 60 information alerts everyday through her email system. Given that tobacco industry is a highly competitive and controversial industry, the information that she processes is rather diversified, from industry trends to regulation updates, from about competitor companies to about illicit trade. She provides information for a wide array of users. Her information service reaches every department of the company: legal, marketing, research and development, corporate affaires, finance, government relations, and etc. To fulfill the information needs, through using numerous commercial databases, she does extensive online research.

Professional D is an associate director and senior analyst of a strategic planning and institutional analysis unit at a top-ranked Canadian university. The unit is responsible for collecting, maintaining, and analyzing various data, in order to provide analytical planning support for the university’s strategic initiatives. Professional D’s work involves a lot of conceptual and critical thinking. Besides his administrative responsibilities, his major tasks include: (1) to conduct specific research projects, and (2) to answer ad hoc requests from the Principal and Vice Principals of the university.

Based on the descriptions, we identified four types of information-centered, task-based work activities the CI professionals are routinely engaged in (see Table 3).

Major Work Activities	
<ul style="list-style-type: none"> • Monitoring information environment • Answering information requests, • Organizing/conducting research projects (primary and secondary) • Compiling internal publications (newsletters, briefings, reports, updates, profiles). 	

Table 3 Information-centered, Task-based Work Activities

5.2 Approaches to Complete the Tasks and Activities

Similar to the diversity of the working tasks and activities, the data collected show a wide variety of approaches to complete these tasks and activities. The approaches present different sets of actions, sequences of steps, and tools that the four CI professionals used.

However, three common characteristics can be identified from the diverse approaches. Firstly, despite the varying working contexts, a general behavioral pattern seems to have emerged – the observed professionals all take data from various sources, then clean them, make sense of them, and then put them together to create something new. That is quite consistent with many conceptual models described in the CI literature; but this time, some concrete evidence has been gathered.

Secondly, although the tools used by the four professionals are varying, it is clear that computer technology in nowadays CI practice is indispensable. The professionals need the tools to access and process information so that some intelligence can be reached.

Thirdly, due to the decentralized structure, it is obvious that the four CI professionals have been engaged in many collaborative efforts. For example, Professional D found that one of the most time-consuming activities for him is to have meetings with various

people. The meetings help him to understand his clients' information need, and help him to collaborate with his colleagues to attain some specific goals. Professional B also involves a lot of interactions with different people. He sees the interactions as a valuable information channel for CI.

5.3 Constraining/Facilitating Forces

The data reveal that several constraining/facilitating forces may influence the work of the observed CI professionals. The first force may come from the *industry* in which the professionals work. The nature of an industry can possibly influence the intensity and scope of CI work. For example, in the case of Professional C, because tobacco industry is a highly regulated system, a lot of her time was spent in updating legal, political, or regulatory information with regard to tobacco products. Additionally, given the fact that illicit trade is one of biggest competitors for her company, she develops a specific information product to keep track of the topic. In the case of Professional A, considering that the public health and prescription drug insurance industry is quite broad, it is crucial for her to collect information not only at the provincial and national level, but also at international level (e.g., information about some European countries' healthcare trends). Moreover, in different industries, there might be different tools and information resources to be used by CI professionals.

The second constraining/facilitating force can be derived from the organization in which the professionals work. The structure, culture, management, rules and resources of the organization may affect extensively the operation and the quality of CI work. The unit that Professional D works for is a highly centralized one in the university. In an organizational chart, it is anchored just below the Associate Provost and the Provost (the chief operating officer). The unit receives a great deal of support from various sectors of the university, so that they save a lot of time and energy in collecting data. In the case of Professional A, she found some difficulties in obtaining support from middle managers. Therefore, she needs to spend a lot of time in motivating them in backing her work. Furthermore, because her team members are all part-timers on CI, she has to invest significant energy and time in mobilizing, coaching, and training them.

The third constraining/facilitating force may come from the CI professional her/himself. Their cognitive abilities, skills, experience, knowledge and personalities may directly influence the performance and completion of their working tasks and activities. Interestingly, during the interviews, when the participants were asked to list some important skills for CI professionals, two were salient. The first one was about critical and analytical thinking skill. They argued that CI professionals rely heavily on their "judgment" and "linking abilities" to cope with compromised information. The other one was about "public relation capabilities". The participants explicated that CI is a highly human, interactive process, and it needs its practitioners to have good philosophy to sell their job and deal with various people.

6. CONCLUSION

In this paper, we summarize the design of an ongoing research about how CI professionals work in real life. Three bodies of relevant literature are briefly revisited, and some preliminary results of the pilot phase of the study are reported. The results show that the four CI professionals observed are engaged in a great diversity of information-centered, task-based work activities, such as monitoring information environment, answering information requests, organizing/conducting research projects,

and compiling internal publications.

There is an obvious need to study CI professionals' jobs in reality. The findings can potentially extend the theoretical base of human information behavior. It may also be of interest to current CI professionals who want to know how their peers work. In the near future, more results about the study will be reported.

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