Chapter II

Sharp by Connection: Linking Competitive Intelligence and Intranets

Paul Hendriks
University of Nijmegen, The Netherlands

Wendy Jacobs
PricewaterhouseCoopers, The Netherlands

ABSTRACT

Assessing the value of ICT to support Competitive Intelligence presumes an understanding of the relationship between the two. The chapter argues that starting from either the ICT or CI side to this relationship and linking to the other, as most studies do, cannot secure a fully adequate conception of ICT's value to CI. Instead, the challenge is to find an appropriate foundation in the relationship itself and use it as a stepping stone for developing an understanding of both ICT and CI. The chapter proposes to use and develop the concept of acceptability to provide that foundation. Acceptability offers a natural connection between the technology and CI

sides. An object—e.g., a technology—cannot be acceptable in a void, but presumes a relation to a context or a subject—e.g., the CI function—to be considered acceptable or unacceptable. The Technology Acceptance Model (TAM) and Task-Technology Fit model (TTF) provide useful elements to develop this approach further. The chapter presents the case of an intranet to support CI, called IntraTel, to illustrate the argument.

INTRODUCTION

Connections play an important role in the realm of Competitive Intelligence (CI—see the definition in Chapter I). Smart connections define smart, or sharp, organizations. Connections of different kinds are at stake here. Firstly, the sharpness of an organization depends to a large degree on how well the organization manages to establish and maintain a viable connection with its environment. Secondly, CI is not just about individuals who perform CI-related tasks, roles and functions, but also about individuals connecting to others to become better at their work. The importance of these connections is indicated by such concepts as CI networks, collection networks, and analysis networks (e.g., Gilad & Gilad, 1988; Kassler, 1997). Thirdly, in this age where the Internet, intranets and associated network technology allow easy access to vast amounts of data, the sharpness of these people networks of CI professionals depends on how well they connect to these technology networks (e.g., McCrohan, 1998). How good are they in "sifting the nuggets" of ICT usage (cf., Kassler, 1997) while avoiding their pitfalls, such as information overload or loss of creativity (e.g., Gill, 1995)?

The connection between CI and ICT is the topic of this chapter. More specifically the chapter focuses on possible connections between CI and intranets as a form of ICT that aims at establishing connectivity. The chapter addresses the connection between CI and intranets from a conceptual perspective. The purpose is to develop an approach for linking CI and intranets, to identify the key concepts needed to establish such an approach, to explore the intricacies involved in defining these concepts and to elaborate how understanding the conceptual interrelationships between these concepts sets the stage for understanding the relationship between CI and intranets, or ICT in general. To avoid the risk of getting bogged down in purely abstract and theoretical discourses without a clear practical relevance to CI management, the discussion is staged in the real-life case of an organization that appeared unsuccessful in introducing an intranet to support its CI. The main argument is conceptual, using the case study for illustration purposes.

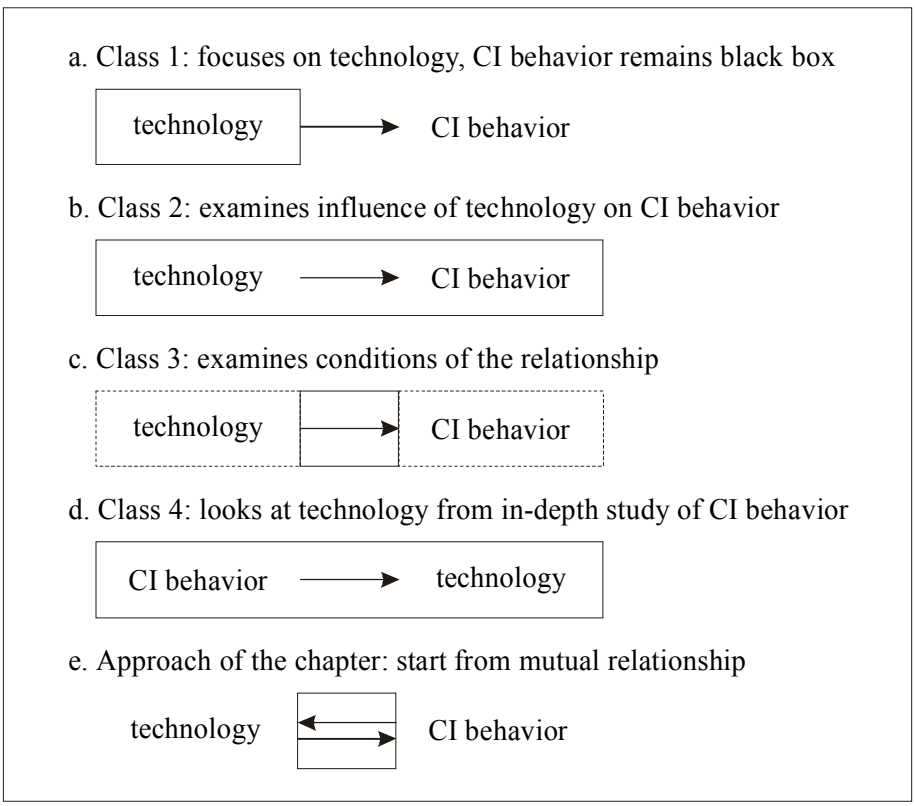
To arrive at an understanding of the relationship between CI and intranet usage the chapter is organized as follows. Firstly, we discuss alternatives for conceiving the relationship between CI and ICT leading to the choice of defining this relationship via the notion of acceptability. Secondly, we explore the concept of acceptability building on two well-researched models: the Technology Acceptance Model (TAM) and the Task-Technology Fit (TTF) model. Thirdly, we present a case study of an organization that introduced an intranet to support its CI, but found that the adoption of the intranet was unsatisfactory. The chapter builds on this case study to illustrate challenges and problems of understanding the value of an intranet for CI at a more general level. Fourthly, we discuss how applying this combined approach of TTF and TAM concepts provides a conceptually powerful perspective for linking ICT and CI. We use the case study to illustrate the elaboration and application of that perspective and give a short overview of the outcomes of applying the approach in the case study.

BACKGROUND

The chapter's purpose is to contribute to an understanding of the relationship between intranets and Competitive Intelligence (CI). Both CI practitioners and scholars have paid much attention to the linkage between ICT in general and CI. Several authors have established the importance of ICT for CI (e.g., Davenport, 2000; Guimaraes & Armstrong, 1998; Hall, 2000). The literature on the relations between CI and Information Systems support can be ordered into four classes according to the attention paid to the technology and CI behavior components of this relationship and their connection (see Figure 1). The first class, which is the most extensive of the four, concerns those studies that concentrate on the possible benefits of IS support, for instance for obtaining and analyzing vast amounts of data (some of the examples of studies falling within the first class are Sugumaran & Bose, 1999; Tan, Foo, & Hui, 2002; Tan & Kumar, 2002). Typically these studies focus on an exploration of design and use of the enabling technologies. Usually, they treat CI behavior as a black box (see Figure 1a). A second class of studies tries to remove at least part of the black box character of CI behavior (see Figure 1b). Typical examples of this class are studies that explore how using ICT may lead to new forms of CI behavior (e.g., Davenport, 2000), which implies that some model of CI behavior has to be specified. Studies that fall within this class examine the

changes the use of specific ICTs has for CI behavior (e.g., Christensen & Bailey, 1998; Teo & Choo, 2001). A third class of studies—shown in Figure 1c—concerns those studies that consider the conditions and circumstances affecting the establishment of the relationship between the technology and CI behavior. For example, Hall (2000) studies some of the technological and cultural barriers that may inhibit effective IS use to support CI. The fourth class concerns those studies whose point of departure is CI behavior instead of technology (see Figure 1d). They call for a deeper understanding of CI behavior, and look at the technology through the lens of the implications of their deepened understanding of that behavior. Examples of studies in this class are Schultze (2000) and Schultze and Boland (2000). Also, the study by Bergeron (2000) may be included in this class, because of his call to develop a better understanding of information-retrieval behavior for CI before designing the tools to support it.

Figure 1. Classes of Studies Addressing the Relationship Between ICT and CI



While all these classes of studies contribute useful elements for understanding the intricacies of the relationship between ICT and CI, they share a common defect. They all treat the technology and CI behavior component as entities that may influence each other, but are conceptually independent. Their common suggestion is that we may conceive of the technology independently from our conception of CI behavior, and vice versa. The studies in all classes treat the relationship between ICT and CI as an external relationship, and not as an internal or conceptual relationship. Our argument developed here is that this understanding of the relationship is unsatisfactory, because current or potential CI behavior defines the technology and vice versa. Our argument is that one should start the process of understanding the technology and CI behavior by coming to grips with their mutual relationship, instead of treating this relationship at the bottom of the list. We propose to use the concept of acceptability to highlight the relationship between the technology and CI behavior as the focal point of attention. A definition of this concept automatically draws attention to the balance, and not to the ends of the balance: questions of acceptability refer to whether something—the technology—can enter into a relationship with someone—the agents of CI behavior. If we manage to define the acceptability of an intranet to the CI function of an organization, we avoid the pitfalls of one-sidedness inherent in other approaches. An approach to defining the relationship between ICT and CI via acceptability has distinct integrative qualities with respect to the various approaches shown in Figures 1a through 1d. The strength of such a definition relates to how well it allows incorporating the insights of these approaches. Therefore the task we set ourselves is defining the acceptability of ICT to CI. Following Grudin (1992) and Nielsen (Nielsen, 1993, 1999) the acceptability of ISs can be split into social acceptability (standards, existence or absence of pressure to use the system, etc.; see also Hartwick & Barki, 1994; Venkatesh & Speier, 1999) and practical acceptability (costs, reliability, usefulness, etc.). In this chapter we concentrate on issues of practical acceptability.

THE ACCEPTABILITY OF AN INTRANET TO SUPPORT CI

As indicated above, the argument presented in this chapter involves that understanding the connection between CI and intranets should start by asking the question of what makes using an intranet acceptable to CI professionals. This argument should not be misunderstood. The suggestion here is not to start

investigations by taking the current operation and tasks of the CI function as the template against which to measure the possible value of an intranet. What the argument suggests is that looking for clues when linking an intranet to CI, either prospective or retrospective, is basically a conceptual undertaking, and that the primary effort in this undertaking is putting the focus on the relationship between the two elements, and not on the two elements of the relationship in isolation.

The task at hand, then, is defining the acceptability of an intranet to support CI. Undoubtedly the best-researched and most widely adopted model for studying matters of practical acceptability is the Technology Acceptance Model (TAM, see Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). TAM is based on a specification and adaptation of the Theory of Reasoned Action (Ajzen & Fishbein, 1980; TRA, Fishbein, & Ajzen, 1975; see also Venkatesh, 1999 for a review). TRA identifies intention to act as the main determinant of human action and attitude towards behavior as the decisive element in the intention to act. In line with this conception TAM suggests that to understand the acceptance of information technology (IT) one should look for variables explaining attitude towards IT usage and intention to use IT. TAM identifies perceived usefulness (PU) and perceived ease-of-use (PEU) as the key independent variables influencing the IT-related attitude and intention to use. PU is defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context" (Davis et al., 1989, p. 985). PEU refers to "the degree to which a person believes that using a particular system would be free from effort" (ibid.). Soon after its introduction in the literature TAM became a very popular model among IT researchers, resulting in hundreds of studies aimed at testing or elaborating the model (selective overviews of TAM research are, for instance, available in Lederer, Maupin, Sena, & Zhuang, 2000; Venkatesh & Davis, 2000). Part of the success of the model undoubtedly relates to its common sense nature and to its appealing simplicity. Part of the success is also explained by the robustness of the model: empirical tests invariably show significant relations between the independent and dependent variables in the model (cf., Lederer et al., 2000; Szajna, 1996; Venkatesh & Speier, 1999). However, it should also be noted that the explanatory power of the original model is not impressive, with a typical explained variance of around 40% (Dillon, 2000). Doll et al. (1998, p. 839) also note, "Despite its wide acceptance, a series of incremental cross-validation studies have produced conflicting and equivocal results that do not provide guidance for researchers or practitioners who might use the TAM for decision making." Among these conflicts and equivocalities are questions as to whether PEU affects usage

directly, only through PU, or both directly and indirectly (for an overview, see Lederer et al., 2000). Also, equivocalities arise when new constructs or new variables affecting the relationships between PEU, PU, and usage are introduced (e.g., Cheung, Chang, & Lai, 2000; Gefen & Straub, 1997; Veiga, Floyd, & Dechant, 2001). Perhaps the best-known modification is a distinction between pre-implementation and post-implementation TAM (e.g., Venkatesh & Davis, 2000). The inherent discussions, while signaling the cause for caution, do not affect the importance of addressing issues of PU and PEU in system design. From the accumulated writings on TAM we draw two conclusions. Firstly, a further elaboration of the two concepts of PU and PEU at the conceptual level is called for. Secondly, using the model should not restrain the attention for additional explanatory variables. The specification of PU and PEU is discussed in the remainder of this chapter. We will not explore the class of additional variables here. The investigation in the case study adopted the pragmatic standpoint of not defining these variables beforehand but inviting respondents to name such factors after considering PU, PEU and TTF.

A model that offers useful ideas for a conceptual elaboration of PU and PEU is the task-technology fit model (TTF-model, e.g., Goodhue, 1995, 1998; Goodhue, Klein, & March, 2000; Keil, Beranek, & Konsynski, 1995; Lim & Benbasat, 2000). The basic suggestion of TTF is that whether or not the qualities of the system will induce people to use it depends on the task concerned. As Goodhue (1995, p. 1828) puts it: "A single system could get very different evaluations from users with different task needs and abilities." While TTF is newer than TAM and has not attracted as much research attention, research results for this model equally show its robustness and explanatory power (see references above). Just like TAM, TTF has a strong common sense appeal in its suggestion that IT usage can only be understood if the reason to use the IT, i.e., the task, is included in the picture. Differences between TAM and TTF concern the fact that the match between task and technology, and not attitude towards usage, is the key focus in the TTF model, as well as the fact that TTF models are mostly used to explain actual usage and not intended usage. While TTF involves a different perspective on utilization behavior than TAM, these models appear to be complementary rather than contradictory. For instance, research by Mathieson and Keil (1998) shows that neither task characteristics nor technology features in their own right can explain variations in PEU, but the interaction between the two classes can. TTF therefore influences or defines PEU. Similar suggestions can be made as to the relationship between TTF and PU (e.g., see Dishaw & Strong, 1999; see also

Venkatesh & Davis, 2000: their "interaction between job relevance and output quality" closely resembles TTF). Research by Dishaw and Strong (1999) corroborates the fruitfulness of the idea to integrate the basic concepts of TAM and TTF, as these authors show that a combined TAM/TTF model outperforms an individual TAM model as well as an individual TTF model.

In short, the research results alluded to above are interpreted as a justification to focus the elaboration of PU and PEU concepts on TTF constructs and variables.

THE CASE OF INTRATEL

To elaborate how to study the connection between CI and intranets through the concepts of PEU, PU and TTF, we present a case study. It concerns a large global consumer electronics firm, which in this chapter shall be referred to as "Consel Corporation." The organization has a center for CI research and associated operations at corporate level, called Central CMI (CMI is short for Consumer and Market Intelligence) and CMI departments for each individual business group (CMI business group TV, CMI business group Video, etc.) as well as for each individual region (CMI Europe, CMI NAFTA, etc.) located at various places all over the world. At the end of 1996 Central CMI came up with the idea of developing a database application for the data sources the department distributed. At the time, the customers of Central CMI received most data via hard copy and some data via e-mail. Both methods had several shortcomings. Delivering in hard copy implied delays because one had to wait until the full report, usually referred to as a "book," was printed. This was a time-consuming and costly process because of their size and number. Further delays were introduced by the delivery method of hard copy, particularly when destinations such as Sao Paulo or Singapore were involved. It was also very difficult, if not impossible, to make the necessary adaptations once the "books" were printed. Sending by e-mail often caused attachments to arrive in mutilated form because of the usually complex graphics included. Also, the department often ran into problems because of the size of the attachments. E-mail also involves risks of security.

Reasons such as these induced the department to develop a system to handle these problems. The underlying rationale of the system was that it should allow Central CMI to ease the delivery of data to its customers and to facilitate both distribution of data and communication among these customers without Central CMI's intercession. Early 1998 the IntraTel system that resulted from

this idea was put into operation. IntraTel was built on IBM's Lotus Notes functionality and was offered to users on Consel Corporation's intranet via the Domino system. IntraTel consisted of the following five applications:

1. Market Data: offers processed data and analyses in the form of presentations concerning markets, market shares of competitors, distribution, price movements, market predictions, and socio-economical and technological trends.
2. Research Projects: contains the results of research projects completed by internal and external investigators.
3. Project Informer: contains information about planned, current and completed research projects run by Central CMI.
4. Let's Japan: provides a monitor of technological developments in Japan and follows the main competitors and their investments in consumer electronics, research and product development in that country.
5. CMI Contacts: contains organizational charts of the organization, and a knowledge map of the connections of Central CMI inside and outside Consel Corporation.

Access to IntraTel has to be authorized by Central CMI. The home page of the system, which is accessible to all Consel Corporation employees, offers a registration form to request permission to use the system. At the time of the research some 250 people all over the world were granted this permission. The first two applications mentioned—Market Data and Research Projects—are the most popular in IntraTel. To illustrate the functionality of IntraTel some examples from Market Data will be presented. The application can be regarded as a collection of search tools on top of a large set of documents, with some additional functionality loosely linked to search actions. Search actions for documents or their authors usually start by selecting one of the categories "product," "region," "contact" or "publications," with an additional entry "new publications." Clicking for instance the option to search for documents related to specific products will offer a taxonomy of products at several hierarchical layers, which is based on the standard classification of Consel Corporation that all employees—in varying degrees of detail—are familiar with. New layers will appear when users zoom in on a specific class of products (or if they choose at any point in the hierarchy to "expand all"). Documents are typically connected to the base categories of the taxonomy. For all documents, additional meta-information is stored, including the names of the authors. Apart from the hierarchical menu system organized around products, regions, etc., some additional search functions are offered. Most of the additional function-

ality in IntraTel is introduced for the purpose of stimulating communication among IntraTel users. A typical example is the response button that is connected to every document. Clicking this button will open a new window allowing the user to send remarks or questions to the authors in question. When the user files his or her comments, an e-mail message is sent to the authors to notify them. To read these comments, they have to log in to IntraTel and navigate to the document to which the comments apply. These comments and reactions are accessible to all users of the system, allowing them to contribute to the discussion.

One year and a half after its introduction, the reception of IntraTel proved disappointing. The data in the login database of the system showed that only a few dozen of the 250 people authorized to use the system did so on a regular basis. The data also showed that users typically only inspected a few pages per visit and that the duration of an average stay in IntraTel was short. Although the central CMI department did not keep track of the number of e-mail and hard-copy requests for information, the undisputed impression existed that, contrary to the intentions and expectations, these numbers did not decrease during the period of IntraTel's operation. These data led Central CMI to the conclusion that the introduction of IntraTel was a failure and that the system did not live up to the expectations of its designers.

The question then is what explains the adoption-failure of IntraTel. Phrased differently, the question is which conditions favor the intranet's acceptability, and which of these conditions were not met in this case. This question concerns the evaluation of the current system, feeding into a possible diagnosis and redesign of a new version of that system. We will discuss the possible answers to these questions by exploring how acceptability can be defined and accessed. The focus in the presentation is not on the answers as such, but on the conceptual basis of the approach.

WHEN WILL AN INTRANET SUPPORT CI?

Some remarks as to reinterpreting TAM and TTF-related insights for the purpose of the subject of the current research—designing an approach to the evaluation, diagnosis, and redesign of an intranet to support CI such as IntraTel—appear fitting. The TAM and TTF models are usually studied in the literature from a different perspective than the current. The typical perspective on these models is to examine the explanatory power of the models, either theoretically or empirically. For the purpose of the current research the relevance of the models derives from their potential to provide a substantiated

and integrated backbone for defining and assessing the current and potential acceptability of the intranet. These two perspectives share common ground, but they also involve shifts in their elaborations of the models and in the importance attached to individual issues. It can be noted that, when discussing implications of their research for IS design, several studies on TAM and TTF explore part of the common ground, usually in a somewhat haphazard way in a concluding discussion section (e.g., Doll et al., 1998; Kekre, Krishnan, & Srinivasan, 1995; Venkatesh & Speier, 1999). The task at hand involves identifying the constituent components of PU and PEU, rather than the "antecedents" of these concepts (cf., Agarwal & Prasad, 1998; Karahanna & Straub, 1999). What is at stake is building a convincing argument to define acceptability of a system within the context of an individual organization and to translate this definition into tangible features of the system.

When using TTF as a key component in the definition of perceived usefulness and ease-of-use, the challenge is to:

1. Identify an appropriate broad model of the tasks without fully specifying it,
2. Identify an equally broad appropriate model of the technology functionalities at a sufficiently abstract level,
3. Connect both models in order to specify them,
4. Identify, define and specify other factors in addition to PU, PEU and TTF.

The focus here is on the first three steps. As indicated above, the fourth step will not be addressed in depth. In the case study presented below we adopted the pragmatic standpoint of asking respondents to identify additional factors after considering PU, PEU and TTF.

The first step—identifying a model of the tasks—involves modeling the things the company has to do to gain and enhance its intelligence about its consumers, markets, competitors, etc. A commonly accepted model for this purpose is the Competitive Intelligence (or CI) cycle (see Chapter I). While several modifications of this cycle exist, the CI cycle typically includes four stages. Firstly, the stage of *planning and direction* sets the main course of CI activities by identifying and interpreting the mission, defining requirements, setting priorities, determining classes of indicators to be monitored and allocating resources. Secondly, the stage of *collection* refers to the activities of data collection and initial processing of these data (identifying and removing errors, matching data from different sources, removing incompatibilities in data format, etc.). Thirdly, the stage of *analysis* concerns processing the available data so they can be used for CI-related decisions, by combining information,

applying statistical or mathematical analysis models, enhancing their accessibility through visualization models, etc. Finally, the CI cycle contains the stage of getting the right outcomes of the analysis stage on the right desks, referred to as *distribution, dissemination, diffusion* or *dispersal*. The first stage of the CI cycle, planning and direction, is outside the scope of the current discussion.

While the CI cycle offers an important instrument for typifying CI tasks, modeling these tasks presumes at least one further elaboration. The complexity of the "CI task" concept also derives from the fact that the definition of actions individuals perform to keep the CI cycle turning depends on how individual actions and their management are assigned to organizational units (departments, work teams, project teams, etc., see also Pirttila, 1998). In turn, the task definition of these organizational units depends on how the company as a whole conceives of the fact that it needs to give its CI flesh and blood (for instance, the various CMI departments described earlier are by no means the only spots in the company where consumer or market intelligence resides). All these elements refer to tasks in the CI cycle, and understanding each element presumes an understanding of the others. To avoid confusion we will use the following terminology: to refer to activities of individuals we will use the term "tasks." To identify the aggregate contributions of departments and groups we will use the term "roles." To indicate the overall CI task of the company we will use the term "function."

The second step in defining TTF, modeling the functionalities of the technology, refers to the need to identify the potential contributions of the intranet application. For this purpose it appears helpful to redefine an intranet as a specific type of groupware (Coleman, 1997). A useful perspective for classifying the functionalities of groupware is the 3C framework (*Groupware White Paper*, 1995), elaborated into a 4C framework (Vriens & Hendriks, 2000). The four C's are circulation, communication, coordination and collaboration. *Circulation* involves the distribution of information to a broader audience, not aimed at establishing some form of interactivity with that audience. *Communication* concentrates on the establishment of interaction between senders and receivers of information. *Coordination* deals with correspondences and conflicts between individual tasks resulting from the fact that group members work on different tasks contributing to a larger task. *Collaboration* occurs when two or more people are working together on the same task. The present or future functionalities of an intranet to support CI may refer to any of these four classes.

The distribution stage of the CI cycle offers a useful starting point for connecting the CI cycle and the 4C framework, which concerns the third step

in defining TTF. Distribution concerns connecting people, which defines the basic functionality of groupware. The CI cycle introduces distribution as a sequence to analysis, which implies that it only concerns moving the outcomes of the analysis to the right desks (in other words, it concerns connecting outcome producers to interested consumers and vice versa). A closer examination shows that more distribution moments appear in the CI cycle, both within and between all other stages of the cycle. The term "collection network" that Gilad and Gilad (1988) introduce indicates that collection of data occurs by experts who have their own expertise combined with information on where they can find related expertise (see also Kassler, 1997). Similarly, they designate the connections analysts use in the course of their work as an analysis network. Ideally these two networks—or rather, sets of networks, as every individual or department may have their own networks—could or should also be mutually linked, and linked to consumers. This reinterpretation of the CI cycle provides the conceptual hooks for connecting to the intranet's functionalities. The concepts of circulation, communication, coordination and cooperation are elaborations of the network formation that is crucial for a properly operating CI cycle, as shown by Gilad and Gilad's discourse on collection and analysis networks. This leads to two conclusions. Firstly, distribution as circulation should not be studied as a final stage in the CI cycle, but should be integrated in the other stages and explicitly linked to the connection between the stages. Secondly, distribution should not just be looked at from the circulation perspective but also from the additional communication, coordination and cooperation perspectives. To understand how an intranet may affect the operation of the CI cycle, its functionalities should be studied with respect to collection, analysis and the interfaces between these two stages. This results in an elaboration of the fit between CI tasks and the functionality of the technology into the 16 classes of interest discerned in Figure 2.

The completion of the third step, defining the relationship between the intranet and CI, will consist of "filling in the cells in the matrix." Depending on the perspective taken this conceptual filling operation will take on a different form and meaning. Here TAM, with its call to distinguish between usefulness and ease-of-use, reenters the stage. To establish issues of usefulness of the intranet the perspective will be on the content of the tasks. To establish issues of ease-of-use the appropriate perspective is on the process of the tasks (that is, on the question as to how the tasks can be performed "with as little effort as necessary"). These two perspectives ensure that usefulness is not defined independent of matters of ease-of-use. Also, ease-of-use is not defined "in a void," which is the risk involved in focusing attention on isolated issues such as

Figure 2. Focal Points for Assessing the Functionalities of an Intranet to Support CI

Groupware functionalities **Stages in the CI cycle**	*Circulation*	*Communication*	*Coordination*	*Collaboration*
Collection	Supporting the flow of data throughout collection networks	Assisting members within and between collection networks in finding each other	Managing shared resources, identifying and handling overlap between the work of individuals, etc.	Smoothing the progress of joint data preparation
Handling collection products	Supporting the flow of data between collection and analysis networks	Supporting contact between collectors and analysts, e.g., for communicating best practices	Managing resources of mutual interest, matching the work of each party to the needs of the others, etc.	Involving analysts and collectors in each other's work
Analysis	Supporting the flow of information throughout analysis networks	Assisting members within and between analysis networks in finding each other	Handling the constraints between sequential analysis tasks	Facilitating the formation and operation of analysis teams
Handling analysis products	Supporting the flow of information from producers to consumers and vice versa	Supporting contact in information supply and command	Promoting that information requests and offers match, etc.	Mutually involving consumers and producers of information in their work

Explanation: the cells provide examples of how groupware functionalities (the columns in the matrix) may support elements of CI work (the rows in the matrix). These examples are general in nature and do not refer to the case study presented in the chapter.

clear organization of files, easy location of data, easy accessibility of data (Goodhue, 1995), training (Riemenschneider & Hardgrave, 2001), feedback, help and documentation (e.g., Nielsen, 1993, Ch. 5). Instead, both usefulness and ease-of-use are defined as specific interpretations of TTF, mutually linked through their common basis in that concept.

THE LACKING ACCEPTABILITY OF INTRATEL

In the case of IntraTel the approach sketched in the previous section was applied in practice. The matrix shown in Figure 2 served as the rationale for identifying reasons for the failed acceptance of the application, as well as for

Table 1. Description of the Sample in the Case Study

User class	*Concept*	*Function within CMI*	*n*	
Intermediate users	Only PU	Market analysts Central CMI	3	
		Market analysts Regional CMI	6	
		Market analysts Business Group CMI	4	
		Market analysts National Sales Organizations CMI	3	
		Total	16	
	PU and PEU	Market analysts Central CMI	6	
		Marketing assistants Central CMI	4	
		Market analysts regional CMI	8	
		IT managers	3	
		Total	21	
End users	Only PU	Product managers	4	
		Product planners	3	
		Marketing managers	9	
		General managers	2	
		Total	18	
Total	PU			55
	PEU			21

exploring possible redesign features to prepare for a successful reintroduction of the system. The data in the investigation were collected through interviews with several parties (see Table 1). The concept of PU interviews were held with both intermediate and end users of the system. The intermediate users were market analysts at the corporate, regional or business unit level. The sample was constructed so as to include a maximum variation concerning the different CMI departments, because Consel considered the differences between departments to be more important for evaluating the system than, for instance, differences between different product groups. The end users included product and marketing managers for individual classes of products and other staff members of the local consumer and market intelligence departments. Members of both the intermediate and end user groups were selected so as to include actual users, designated users who appeared to use the system hardly or not at all, and potential users who had not been included in the IntraTel-related efforts before. These three groups represented about 30%, 50% and 20%, respectively, of the intermediate and end user groups included in the sample. As for the concept of PEU, the additional questions in the interviews were more time-consuming as they involved walking through the system in sessions that lasted up to half a day. Because of the length of these interviews, they were held only with intermediate users, as this group appeared to be more easily accessible

than the end users. People were selected for inclusion in this part of the sample based on the amount of experience they had with the system. The largest group (15 people, or about 70%) were experienced users who had seen most of the functionality of IntraTel at least several times. The remaining people were only just starting to use the system. They were included to assess how the system on first acquaintance will appeal to its users or deter them, which aspects of the system are the most eye-catching to novices in a positive or negative sense, and which improvements would be most needed for potential new users to be attracted to use the system.

While a discussion of the approach followed in reassessing IntraTel is the focus of attention here, the account of the case study would be incomplete without an indication of the outcomes of the research. The interviews revealed that the most important reasons why people did not use IntraTel were unfamiliarity with the existence of the system and the fact that people did not know how to use the system. They also showed that people preferred to use information on hard copy. Both elements of usefulness and ease-of-use appeared helpful in specifying reasons for disappointing usage and offering suggestions for redesign.

As for its usefulness, IntraTel was considered an appropriate system to circulate information, provided that all parties involved were willing to publish their sources. IntraTel was used for searching information. It was not used as a communication system, and respondents indicated that they would not use it as such in the future. The main reasons for this were a generally felt preference for personal contact, the resistance to broadcast personal remarks to an anonymous audience, the fact that hardly any questions that people had were related to an individual document, and the tediousness of writing down questions. IntraTel was not considered useful as a coordination or collaboration system either, because respondents indicated that they did not experience problems in these realms that the system could help resolve. As for the content of the system, a key element of usefulness, respondents stated that they missed information about competitors and distribution. They also asked for an increase in the number of analyses offered on IntraTel. Dedicated presentations linking several sources to a specific research goal are considered even more useful than sources by themselves are, either as such or as templates for performing new analyses leading into new presentations.

As for ease-of-use, the interviews showed that the user-friendliness of IntraTel left a lot to be desired. The overviews in the system were not clear and the system was not considered attractive. IntraTel even got characterized as tedious and not inviting to work with. Also, several controls were reported to

malfunction: the response button was not being used and the search function had to be improved. Three facets of the system related to ease-of-use were shown to deserve special mention. Firstly, the indistinctness and intricacy of the registration procedure form appeared to deter people from requesting access to the system. Secondly, updating, while being recognized as crucial for the system to be useful, was generally considered as a cumbersome procedure, particularly because no clarity exists as to what the responsibilities of individual users and departments are regarding updating, and which documents can be updated by specific users and which cannot. Thirdly, respondents complained about deficient explanation facilities within the system, the lack of a help desk for handling individual problems and the absence of short training courses. Giving explanations, as several respondents suggested, could make clear that using IntraTel will save time and may help convince people to supply their own information.

Based on the research, the continuation of IntraTel has been recommended to Consel Corporation, a recommendation that was taken up by the company. The system may help solve several difficulties people experience in their jobs. Particularly, it may help reduce the chance of missing out on vital information. Continuation of the project is likely to fail without substantial promotion of IntraTel. Many people are unfamiliar with the system, as a result of which they obviously do not use it. Promoting IntraTel may also help promote Central CMI and may help encourage people to provide their information.

FUTURE TRENDS AND RESEARCH

ICT has the potential to support and change the CI function. However, practice shows that in the CI realm, as in other realms, the failure rate of ICT applications is high (Schultze & Boland, 2000). A more hidden ICT-related pitfall is that, even if the adoption of ICT did not fail, using ICT may impair the information-seeking behavior of CI professionals (Christensen & Bailey, 1998; Teo & Choo, 2001). Even if such negative effects of ICT usage do not surface in the short run, they may do so in the long run, reducing the organization's awareness of its environment instead of enhancing it (Gill, 1995). All these concerns indicate that our understanding of the possible value of ICT to CI is still far from satisfactory. The implication is not that we need to gain a better understanding of Competitive Intelligence Systems as such, but that we should improve our conception of the relationship between these systems and the operation of the CI function. In recent years part of the research on ICT support for CI shows a move away from purely technical issues towards a desire to

comprehend the CI behavior side of the equation (Bergeron, 2000; Schultze, 2000; Schultze & Boland, 2000). We fully endorse the idea that research needs to be developed further down this path. The contribution of the chapter is to supply the signpost indicating the direction the path should take: Research should develop our understanding of ICT and CI from the perspective of their mutual relationship and not vice versa. The challenge is therefore to build a sufficiently rich conception of that mutual relationship without adopting a fully detailed model of either the technology or CI.

The chapter has explored the concept of acceptability as a possible conceptual starting point to ensure a perspective on the mutual relationship between ICT and CI. The exploration presented here by no means brings closure to the discussion on that relationship. Several open ends remain. Our argument has not been that the concept of acceptability is the only possible concept for building the appropriate perspective. The need to explore additional or alternative approaches using other concepts remains. Neither did we explore all sides of the concept of acceptability, but focused on matters of practical acceptability, sidestepping those of social acceptability. Also, we did not fully cover the ground of practical acceptability. For instance, variables outside the scope of the TAM and TTF models were addressed only in a haphazard way in the chapter. One further limitation of the present study is that we did not delve deeply into the relationship between the concept of acceptability and the overall business setting in which the value of ICT should be defined. For instance, we did not explore the connections between acceptability and business performance. The concept of PU, particularly when elaborated along TTF lines, does introduce individual performance into the picture (for an overview of studies addressing the connections between ICT acceptability and individual performance see Townsend, Demarie, & Hendrickson, 2001). However, the connection to business performance is far more complex, for instance because ICT use may well lead to individual performance going up while performance at an aggregate level goes down. Our justification for addressing the role of ICT in business via the concept of acceptability is that if a system is not acceptable to users, it cannot lead to enhanced business performance. This does not imply that the reverse relationship also holds. A more encompassing investigation of the connections between acceptability and business performance would involve including other organizational variables such as organization structure and strategy into the picture, which is beyond the scope of the present chapter. All these shortcomings show the limitations of the current research and define areas for future research.

CONCLUSION

In this chapter we have argued that an integration of the TAM and TTF models offers a powerful and workable conceptual basis for connecting CI and intranets. For the purpose of building an approach for assessing the possible or actual value of an intranet for CI rooted in this conceptual basis, we have elaborated the concept of fit between CI-related tasks and functionalities to specify elements of perceived usefulness and perceived ease-of-use of an intranet. Reactions at Consel Corporation upon the completion of the investigation into the adoption-failure of IntraTel showed that the reception of the approach and its outcomes was favorable. Particularly, appreciation was voiced as to the integrated nature of the picture that the interviews draw because of their conceptual foundation, instead of an only loosely connected collection of individual assessments and recommendations. These are indications of the value of the approach elaborated here. Perhaps more relevant to a broader public than what the outcomes of the research imply for Consel Corporation are the lessons this case study may teach about the assessment of the PU and PEU of ISs and their mutual connections through TTF. It is important to note that the concepts of PEU, PU and TTF are mutually related in a conceptual sense. For instance, what determines ease-of-use for operations within one task realm may only be partially similar to the determinants of ease-of-use in another realm. The examples described in Figure 2 that elaborate TTF in the case study provide the hooks for assessing elements of both PU and PEU, thus connecting these two concepts via TTF. While the close conceptual connections between PU, PEU and TTF call for an integrated approach in an assessment, there is also cause for a separation of usefulness and ease-of-use issues. The main reason for this is the questionable validity of pre-implementation assessments of PEU. These calls for simultaneous separation and integration appear to be causing a deadlock. Two suggestions may help reduce the paralyzing effect of this deadlock. Firstly, linking both PU and PEU to a common basis instead of only linking them mutually (cf., the rationale developed here, as pictured in Figure 2) ensures a certain separation in treatment without losing connection. Secondly, equally important is the need for a repeated consideration of all stages of the system lifecycle, an aspect that was not explicitly addressed in the description of the case study. Diagnosing and designing for acceptance on the one hand and monitoring, evaluating and explaining possible lack of acceptance on the other call for continuous and interrelated attention. Models such as TAM and TTF appear valuable because they may help safeguard the conceptual connections between the links in sequential intervention cycles.

REFERENCES

Agarwal, R. & Prasad, J. (*1998*). The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems, 22*(1), 15-29.

Ajzen, I. & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Upper Saddle River, NJ: Prentice-Hall.

Bergeron, P. (2000). Regional business intelligence: The view from Canada. *Journal of Information Science, 26*(3), 153-160.

Cheung, W. M., Chang, M. K., & Lai, V. S. (2000). Prediction of Internet and World Wide Web usage at work: A test of an extended Triandis model. *Decision Support Systems, 30*(1), 83-100.

Christensen, E. W. & Bailey, J. R. (1998). Task performance using the library and Internet to acquire business intelligence. *Internet Research-Electronic Networking Applications and Policy, 8*(4), 290-302.

Coleman, D. D. (1997). *Groupware: Collaborative strategies for corporate LANs and intranets*. Upper Saddle River, NJ: Prentice Hall.

Davenport, E. (2000). Social intelligence in the age of networks. *Journal of Information Science, 26*(3), 145-152.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer-technology—A comparison of 2 theoretical-models. *Management Science, 35*(8), 982-1003.

Dillon, A. (2000). Group dynamics meet cognition: Combining socio-technical concepts and usability engineering in the design of information systems. In E. Coakes, D. Willis, & R. Lloyd-Jones (Eds.), *The New SocioTech: Graffitti on the Long Wall* (pp. 119-126). London: Springer.

Dishaw, M. T. & Strong, D. M. (1999). Extending the technology acceptance model with task-technology fit constructs. *Information & Management, 36*(1), 9-21.

Doll, W. J., Hendrickson, A., & Deng, X. (1998). Using Davis's perceived usefulness and ease-of-use instruments for decision making: A confirmatory and multigroup invariance analysis. *Decision Sciences, 29*(4), 839-869.

Fishbein, M. & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Gefen, D. & Straub, D. W. (1997). Gender differences in the perception and use of e-mail: An extension to the technology acceptance model. *MIS Quarterly, 21*(4), 389-400.

Gilad, B. & Gilad, T. (1988). *The Business Intelligence System, A New Tool for Competitive Advantage*. New York: Amacom.

Gill, T. G. (1995). High-tech hidebound: Case studies of information technologies that inhibited organizational learning. *Accounting, Management and Information Technologies, 5*(1), 41-60.

Goodhue, D. L. (1995). Understanding user evaluations of information systems. *Management Science, 41*(12), 1827-1844.

Goodhue, D. L. (1998). Development and measurement validity of a task-technology fit instrument for user evaluations of information systems. *Decision Sciences, 29*(1), 105-138.

Goodhue, D. L., Klein, B. D., & March, S. T. (2000). User evaluations of IS as surrogates for objective performance. *Information & Management, 38*(2), 87-101.

Groupware White Paper. (1995). Unpublished manuscript. Cambridge, MA.

Grudin, J. (1992). Utility and usability: Research issues and development contexts. *Interacting With Computers, 4*(2), 209-217.

Guimaraes, T. & Armstrong, C. (1998). Exploring the relations between competitive intelligence, IS support, and business change. *Competitive Intelligence Review, 9*(3), 45-54.

Hall, H. (2000). Online information sources: Tools of business intelligence. *Journal of Information Science, 26*(3), 139-143.

Hartwick, J. & Barki, H. (1994). Explaining the role of user participation in information-system use. *Management Science, 40*(4), 440-465.

Karahanna, E. & Straub, D. W. (1999). The psychological origins of perceived usefulness and ease-of- use. *Information & Management, 35*(4), 237-250.

Kassler, H. S. (1997). Mining the Internet for competitive intelligence: How to track and sift for golden nuggets. *Online: The Magazine of Online Information Systems, 21*(5), 34-45.

Keil, M., Beranek, P. M., & Konsynski, B. R. (1995). Usefulness and ease of use—Field-study evidence regarding task considerations. *Decision Support Systems, 13*(1), 75-91.

Kekre, S., Krishnan, M. S., & Srinivasan, K. (1995). Drivers of customer satisfaction for software products - Implications for design and service support. *Management Science, 41*(9), 1456-1470.

Lederer, A. L., Maupin, D. J., Sena, M. P., & Zhuang, Y. L. (2000). The technology acceptance model and the World Wide Web. *Decision Support Systems, 29*(3), 269-282.

Lim, K. H. & Benbasat, I. (2000). The effect of multimedia on perceived equivocality and perceived usefulness of information systems. *MIS Quarterly, 24*(3), 449-471.

Mathieson, K. & Keil, M. (1998). Beyond the interface: Ease of use and task/technology fit. *Information & Management, 34*(4), 221-230.

McCrohan, K. F. (1998). Competitive intelligence: Preparing for the information war. *Long Range Planning, 31*(4), 586-593.

Nielsen, J. (1993). *Usability Engineering*. Boston, MA: Academic Press.

Nielsen, J. (1999). *Designing Web Usability*. Indianapolis, IN: New Riders.

Pirttila, A. (1998). Organising competitive intelligence activities in a corporate organisation. *Aslib Proceedings, 50*(4), 79-84.

Riemenschneider, C. K. & Hardgrave, B. C. (2001). Explaining software development tool use with the technology acceptance model. *Journal of Computer Information Systems, 41*(4), 1-8.

Schultze, U. (2000). A confessional account of an ethnography about knowledge work. *MIS Quarterly, 24*(1), 3-41.

Schultze, U. & Boland, R. J. (2000). Knowledge management technology and the reproduction of knowledge work practices. *Journal of Strategic Information Systems, 9*(2-3), 193-212.

Sugumaran, V. & Bose, R. (1999). Data analysis and mining environment: A distributed intelligent agent technology application. *Industrial Management & Data Systems, 99*(1-2), 71-80.

Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Management Science, 42*(1), 85-92.

Tan, B., Foo, S., & Hui, S. C. (2002). Web information monitoring for competitive intelligence. *Cybernetics and Systems, 33*(3), 225-251.

Tan, P. N. & Kumar, V. (2002). Discovery of Web robot sessions based on their navigational patterns. *Data Mining and Knowledge Discovery, 6*(1), 9-35.

Teo, T. S. H. & Choo, W. Y. (2001). Assessing the impact of using the Internet for competitive intelligence. *Information & Management, 39*(1), 67-83.

Townsend, A. M., Demarie, S. M., & Hendrickson, A. R. (2001). Desktop video conferencing in virtual workgroups: Anticipation, system evaluation and performance. *Information Systems Journal, 11*(3), 213-227.

Veiga, O. F., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology, 16*(3), 145-158.

Venkatesh, V. (1999). Creation of favorable user perceptions: Exploring the role of intrinsic motivation. *MIS Quarterly, 23*(2), 239-260.

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.

Venkatesh, V. & Speier, C. (1999). Computer technology training in the workplace: a longitudinal investigation of the effect of mood. *Organizational Behavior and Human Decision Processes, 79*(1), 1-28.

Vriens, D. J. & Hendriks, P. H. J. (2000). Viability through web-enabled technologies. In M. Khosrowpour (Ed.), *Managing Web-Enabled Technologies in Organizations: A Global Perspective* (pp. 122-145). Hershey, PA: Idea Group Publishing.