

# Competitive Intelligence and the Specificity of Information

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Much has been said and written about the need for organizations to become more flexible and responsive to an increasingly fast-paced environment. Developing such flexibility and responsiveness, however, requires as a first step that the organization have in place an effective competitive intelligence (CI) structure that allows it to capture relevant information from the environment in a timely manner. In designing a CI structure, the organization must make at least two critical decisions:

- *What information to collect.* This is essentially a decision on the allocation of limited CI gathering resources. Given the almost infinite sources of potentially relevant information in a firm's environment, how do organizations and managers decide which sources to monitor on an ongoing basis and which ones to access only on an as needed basis?
- *Who should collect the information.* Many firms, recognizing the importance of collecting good CI, have

*established a centralized function with individuals who have this as their primary objective. It is also recognized that each individual within the organization is also an intelligence antenna (Prescott & Gibbons, 1992). If CI is a parallel process, how do organizations and managers decide what information individual decision makers must collect themselves and what information the central CI unit will collect?*

In each case the decision must be based on the nature of the information itself. Organizations have not had a good way of conceptualizing information to assist with these decisions. In this article, we develop such a notion—information specificity—and propose it as a useful basis on which to make each of the above decisions.

Information specificity has two components. *Knowledge specificity*, or human specificity, is the extent that a piece of information requires specific knowledge to inter-

pret and is meaningful only to the few individuals who possess that knowledge. *Time specificity* is the extent to which information must be acquired and/or used soon after it becomes available or it decreases in value.

The organization of the article is as follows: (1) define four generic CI strategies that a firm can follow; (2) discuss the notion of information specificity; (3) describe the different elements of the costs of acquiring information that the organization must trade off in deciding among the strategies; (4) discuss how the specificity of information affects these cost elements and, therefore, the choice among the four strategies; (5) propose a series of action steps for establishing a CI structure; (6) conclude with a suggestion for an expanded role for the CI professional.

### Intelligence Gathering Strategies

For each potential source of information in the environment, a firm must make two decisions:

- *Regular monitoring versus focused search:* Should the firm monitor the source on a continuing basis (regular monitoring) or access it only on an as needed basis, in response to a need for specific information (focused search)?
- *Centralization versus decentralization:* Should the information be collected by the ultimate user himself/herself (the decentralized strategy) or should the task of gathering the information be assigned to a specialized CI unit (the centralized approach)?

These two dimensions imply four different CI strategies:

- *Centralized, regular-monitoring:* the centralized CI unit is assigned the task of monitoring a potential source on an ongoing basis and conveying relevant information to the appropriate person(s) in the organization.

- *Centralized, focused-search:* the central CI unit may access the source in response to a specific request for information from a user.
- *Decentralized, regular-monitoring:* the user himself/herself chooses to monitor a potential source of information on an ongoing basis.
- *Decentralized, focused-search:* the user may personally access the source in response to a specific need for information.

While the above categories represent a useful basis for decision making, they are not always mutually exclusive. In many cases a manager, and an organization, may be pursuing multiple strategies simultaneously. For example, while a central CI unit may be asked to monitor a particular information source on an ongoing basis, an individual manager may also occasionally choose to access the source directly for specific information. As noted earlier, gathering CI is a truly parallel process. At the same time, some general guidelines on the optimum division of labor and allocation of resources are worthwhile. That is our intent in this article.

### Information Specificity

The concept of information specificity is derived from the notion of asset specificity, or transaction specific investments in transaction cost theory (Williamson, 1975, 1985). A transaction specific investment loses most of its value if not used in the context of the particular transaction for which it was originally made. There are many different forms of asset specificity, but in the context of information, we define two forms of specificity—human specificity (or knowledge specificity) and time specificity. Within each category, we can further distinguish between specificity in use and in acquisition (Table 1).

Table 1. The Specificity of Information

	Time Specificity	Human Specificity
Specificity in acquisition	Information that must be captured at a specific point in time	Information that can only be captured by someone with specific knowledge
Specificity in use	Information that decreases in value unless used soon after it becomes available	Information that can only be profitably used by someone with the required specific knowledge

### Human Specificity

Information has high human specificity if it is meaningful to only a small number of individuals. Human specificity usually arises when the information can only be interpreted by the specific knowledge possessed by an individual(s). Thus, human information specificity can also be termed knowledge specificity.

Here we are distinguishing between knowledge and information. This can be confusing since knowledge is, in some senses, just information. The distinction is that knowledge refers to the stock of information possessed by an individual, based on previous experience and training. Information is the regular, ongoing flow of data and symbols to which an individual is exposed. Note that what is information at one point can become part of the individual's or organization's knowledge base in the future.

There are two primary forms of specific knowledge: scientific or technical knowledge, and knowledge of context, or knowledge of particular circumstances of time and place (Hayek, 1945; O'Reilly & Pondy, 1979). The technical knowledge required to operate a complex piece of machinery falls in the former category. The specific knowledge of the machine's peculiarities that an engineer may have accumulated over years of operating it falls into the latter category. Similarly, the professional medical knowledge possessed by a doctor falls in the former category, while the detailed knowledge that a doctor possesses about the idiosyncrasies of a particular patient that he has treated over the years falls into the latter category.

Knowledge is specific not only because few individuals possess it, but also because it is expensive to transfer—"the more costly knowledge is to transfer, the more specific it is, and the less costly the knowledge is to transfer, the more general it is" (Jensen and Meckling, 1990). Specific knowledge is expensive to transfer because it cannot easily be codified (Winters, 1987; Kogut and Zander, 1992) and/or aggregated meaningfully (Hayek, 1945; Christie, 1993). Individuals often know more than they can easily state—they often possess significant amounts of tacit knowledge (Polanyi, 1966).

For instance, one of the primary challenges facing developers of expert systems is to extract from the experts the knowledge of how they perform a particular task. Most experts find it hard to state exactly how they do what they do, to codify their tacit knowledge. Knowledge is codifiable and easy to transfer (or nonspecific in our terminology) if it can be structured into "a set of

identifiable rules and relationships. . . . Coded knowledge is alienable from the individual who wrote the code" (Kogut and Zander, 1992).

The knowledge of how to compute the net present value of an investment is relatively easy to codify into a precise set of instructions. These instructions can then be easily and inexpensively shared with anyone who needs the knowledge. This is not specific knowledge even if it is possessed by few people in the organization.

Not all kinds of knowledge, however, are amenable to codification, such as experiential knowledge that is acquired by an individual as a byproduct of doing his or her job. Thus, "drafting a recipe for the manufacturing of a musical instrument is unlikely to capture the requisite skills of a craftsman" (Kogut and Zander, 1992). Similarly, a heart transplant surgeon cannot easily codify his or her knowledge into a precise set of instructions. How many of us would be willing to choose a surgeon who had learned only by reading a set of rules?

We can distinguish between specificity in use versus specificity in acquisition. Information that is human specific in use can only be profitably used by the person with the necessary specific knowledge; however, the information may initially be acquired by someone other than this person. On the other hand, information that is human specific in its acquisition as well, can only be acquired by a person with the necessary specific knowledge. A person without this specific knowledge would not be able to recognize what information was relevant and useful. This is particularly significant to a CI professional whose primary task and contribution is the ability to recognize (and transfer to appropriate personnel) potentially relevant information.

Consider the example of a product development team in an organization that decides what new products to try and bring to market. One of the inputs this team needs is information on announced and planned new product offerings by competitors. This includes market information such as positioning and pricing, and technical information about the materials and processes used in making the product. A central CI unit can track and collect the market-based information since it takes very little specific knowledge to gather this information (this information has low knowledge specificity in acquisition).

On the other hand, technical information about the conductivity properties of the metal alloy or the type of metal bonding process used by a competitor must be gathered personally by the R&D scientists in the devel-

opment team through an examination and analysis of the competitors' products. Here, the technical information is highly knowledge specific in acquisition. To know what aspects are key to examine, what analyses to perform and what the results mean, requires the specific knowledge possessed by the R&D scientist.

**Time Specificity**

Information can also be time specific in its acquisition or use. Acquisition time specific information must be captured at a specific time, otherwise it becomes less useful or perhaps even unavailable. For example, scientists at the National Seismological Laboratory (NSL) must capture the magnitude of an earthquake when the earthquake strikes or it will never be available (assuming they are the only ones that monitor earthquake magnitudes). This information is acquisition time specific for the NSL. The same is not true for a scientist researching earthquake trends over time. They can obtain the information from the NSL at any time.

Information is time specific in use if it decreases in value unless used very soon after it becomes available. An example is a stock quote to a speculative investor—there is a very short time window when this information is really valuable to the investor. This same information is not time specific in use to a researcher studying historical trends in the valuation of certain stocks. By extension, information that is time specific in use is time specific in acquisition as well—to use information right after it becomes available, one must capture it first.

Information that is acquisition time specific, on the other hand, is not necessarily use time specific. In the earthquake example, the magnitude may have to be captured at the time of the earthquake but the information may be analyzed just as effectively at a later date (depending on the purpose of the analysis).

**Information Acquisition Costs**

There are four primary cost elements in acquiring information:

- *Monitoring/search costs: the time, effort, and money expended by an individual user, or the central CI unit, in either monitoring a source of information on a regular basis or conducting a focused search for required information. These costs are clearly higher when an information source is routinely monitored—and therefore requires an ongoing commitment of resources—versus when information is acquired via a focused search on an as-needed basis.*
- *Information transmission costs: transmitting information from the central CI unit to the user, assuming the former is responsible for initially collecting the information.*
- *Knowledge transfer costs: knowledge that must be transferred from the user to the acquirer so the latter can interpret and acquire the correct information.*
- *Opportunity costs: missed opportunities or losses suffered because the relevant information was not available to the right person at the right time.*

**Information Specificity and CI Strategies**

The specific relationships between information specificity and CI strategies are summarized in Table 2. As the table shows, the time specificity of information determines whether or not an information source should be routinely monitored. The rationale behind this is relatively simple. By definition, when information is time specific, it must be captured as soon as it becomes available. The only way to be sure is to routinely monitor the information source. For information that is not time specific, it is more efficient to search for it on an as needed basis. Thus, for time specific information, the higher monitoring costs of regular surveillance will be more than offset by the reduced opportunity costs of not having the right information at the right time.

The human specificity dimension—in particular, human specificity in acquisition—determines whether the information should be acquired by the final user or delegated to the central CI unit. Information that is

**Table 2.** *Information Specificity and CI Strategies*

Human Specificity in Acquisition	Time Specificity in Acquisition	
	High	Low
High	Decentralized, regular monitoring	Decentralized, focused search
Low	Centralized, regular monitoring	Centralized focused search

human specific in acquisition should be acquired by the ultimate users themselves. While this increases the monitoring or search costs to the ultimate user, it reduces the:

- **Information transmission costs.**
- **Knowledge transfer costs:** *For a central CI unit to acquire specific information, the user must first transfer specific knowledge to someone in the CI unit which, by definition, is expensive to do. Having the user acquire the information himself/herself will eliminate these knowledge transfer costs.*
- **Opportunity costs:** *If the transfer of knowledge to the CI unit is imperfect, the user may miss out on vital information. By monitoring the information directly, the user reduces the chances of this happening.*

When the information is not acquisition knowledge specific, deciding to centralize or decentralize the acquisition process becomes more complex. Several additional factors come into play. Is the information knowledge specific in use? If so, and only a single user needs the information, then the decision of who should acquire the information depends on the relative cost of the user's time versus the time of the CI professional.

The more senior the user, the more likely it is that his or her time will be more profitably used elsewhere. Then the CI unit should be delegated the task of acquiring the information even if this entails additional information transmission costs. Unlike information that is acquisition knowledge specific, this delegation will not entail any significant knowledge transfer costs. Since no specific knowledge is necessary to acquire this information, the user does not need to transfer knowledge to the CI unit. Any knowledge that does need to be transferred will be general knowledge that is inexpensive to transfer. There will also be little or no opportunity costs. Since the CI unit possesses the required knowledge, the probability of missing out on vital information should not be much higher than if the user were to acquire the information directly.

On the other hand, if information is not knowledge specific in use, the information may ultimately be of value to more than one person in the organization. In that case, it would be more efficient to delegate the information acquisition process to the central CI unit just to take advantage of scale economies. This would also reduce the probability that the same information is independently collected by multiple people in the organization.

As the above discussion suggests, the primary factor affecting the decision of who should acquire certain information, and when, is the knowledge and time specificity in information acquisition. The specificity in use dimension, on the other hand, is very useful in determining how, and to whom, the information should be disseminated once it has been collected. We discuss this briefly in the next section.

### Guidelines for the CI Professional

The discussion above suggests a useful sequence of action steps for establishing an organization's CI structure:

#### 1. *Identify the information needs of the organization.*

Before any CI structure can be established, the organization must determine exactly what its information needs are. Interview individual managers in different functional areas and departments and ask them about external factors that can affect their activities and their decisions. This will create a list of relevant environmental variables, and, by extension, a list of all the environmental sources that the organization can potentially monitor.

#### 2. *Assess the information and time specificity of each piece of information.*

For each potential source of information in the environment, the organization must then determine the levels of knowledge specificity in acquisition and time specificity. The level of knowledge specificity in acquisition is the specific knowledge required to decode the information's relevance. The level of time specificity is determined by the need to capture or use the information as soon as it becomes available.

#### 3. *Allocate CI tasks between the final users and the Central CI unit.*

Based on the analysis proposed in step 2 above, assign the task of gathering highly knowledge specific information to the final users themselves while delegating less knowledge specific information to the central CI unit.

#### 4. *Determine which potential sources of information to monitor on an ongoing basis.*

The analysis in step 1 will probably generate a list of many more potentially relevant information sources than the organization can possibly routinely monitor. Thus, based again on the analysis in step 2, the CI function should ensure that someone, either the user or the central

CI unit, is regularly monitoring those information sources likely to yield highly time specific information.

##### 5. *Develop a strategy for disseminating information.*

For information collected by the central CI unit, it is also necessary to have an appropriate distribution strategy so the information is made available to the right person at the right time. This can be done by examining the time and knowledge specificity in use of each piece of information. Information with high knowledge specificity in use will have limited distribution—only to the person(s) with the specific knowledge. Information that is low in knowledge specificity in use should be made available to a much wider audience. Similarly, highly time specific information must be communicated to the intended recipients in a form that immediately attracts their attention (for instance, with a directly communicated message).

For less time specific information, the potential users need not be informed immediately. It may be sufficient to make this information part of an organizational data base whose general contents are known to users. The information can then be accessed by the users as and when they choose.

A potential conflict may arise for information that is knowledge specific in use if the person with the specific knowledge is not the person with the decision authority to act on the information. This is an undesirable situation from the organization's point of view. Either the person making the decisions will do so without the benefit of the required information and specific knowledge, or the specific knowledge must be frequently transferred from the knowledge holder to the decision maker—an expensive proposition. Organizations must make every attempt to co-locate decision rights with those who have the specific knowledge required to interpret the information necessary to make the decision.

##### 6. *Continually reevaluate and restructure the CI function.*

The level of information specificity in an organization will change over time. For instance, when there is rapid innovation and shifts in production paradigms (in the early stages of an industry or in a period of change for an organization), information may be comparatively of higher human specificity than in mature industries, or at more stable times in the organization's history. Thus, the amount and nature of information collected by the CI

unit may change across the industry life cycle. The CI unit should periodically monitor this, and adjust its information collection strategy accordingly.

### **An Expanded Role for the CI Unit?**

Traditionally, the CI unit has focused exclusively on external competitive information. We suggest that a useful additional role for the CI unit may be as a *coordinator of key internal information and knowledge*. From an individual decision maker's point of view, relevant CI need not exist external to the organization, but may be contained in other parts of the organization which the individual, acting alone, may not be aware of.

In steps 1 and 2, the CI unit would have already collected information about the intelligence needs of the organization as well as the specific knowledge possessed by different individuals in the organization. By judiciously combining these two pieces of information, the CI unit may be able to provide a valuable additional service to the organization.

For instance, multiple individuals in the organization with the same specific knowledge each routinely monitor the same source of information. The central CI unit may not be able to take over the role of monitoring the information because of the specific knowledge required. However, it may be able to help eliminate redundancy by coordinating the sharing of the information among them.

Similarly, if an individual in one part of the organization possesses specific knowledge that is relevant to a decision in another part of the organization, the CI unit may be able to facilitate the sharing of that knowledge through its internal knowledge database. With these activities the CI unit will, over time, promote organizational learning by reducing the specificity of information and creating a shared view or understanding of organizational activities to a greater degree than if it viewed itself only as an external gatekeeper.

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