

Tacit Knowing: A Field Study

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Those who study tacit knowledge have taken the position that tacit knowledge, by definition, cannot be measured directly. If knowledge is tacit, they say, its owner cannot articulate it. According to this line of thinking, tacit knowledge can only be inferred through its consequences. A person with much tacit knowledge in a knowledge domain will be an expert. An expert will perform better than a novice. Therefore, if a person performs better than others, the researcher infers tacit knowledge. This is an unfortunately circular way to test the hypothesis that tacit knowledge causes high performance. In our study, we argue that a better way to test and understand tacit knowledge is to understand the level of sophistication and integration of subsidiary elements in use while the expert is attending to a focal object. We found that in analyzing the language in use during a specific problem or decision-making episode, it may be possible to identify subsidiary elements in use, primarily by their absence.

INTRODUCTION

Tacit knowledge is an important construct in management, education, and psychology literature. Research includes theoretical work, some empirical work, and commonly, a kind of reference to, and “tacit” acceptance of, the idea in general. In this paper we make the argument that the general methodology used to determine the presence or absence of tacit knowledge needs to be reconsidered. According to the general propositions of the literature, tacit knowledge can only be inferred through its consequences. In fact, the possibility for articulation is ruled out by definition.

The standard methodological approach for determining the presence of tacit knowledge is to look for its consequences. The consequence of tacit knowledge in a knowledge domain effects performance. A person with much tacit knowledge in a particular knowledge domain will perform better than a person with little tacit knowledge in the same knowledge domain. The person with much tacit knowledge is defined as an expert. The person with little tacit knowledge is defined as a novice. How, then, do we seek to discover the presence of tacit knowledge? We

measure performance of experts and novices. Experts perform better than novices. We then conclude that the experts have tacit knowledge.

An expert will perform better than a novice. That is part of what it means to be an expert. We will always conclude that experts have tacit knowledge. This is an unfortunately circular and useless way to test the hypothesis that tacit knowledge causes high performance. In our study, we argue that a better way to test and understand tacit knowledge is to understand the level of sophistication and integration of subsidiary elements in use while the expert is attending to a focal object. We do this by deconstructing the language and situation described in our subject's written journal during a specific decision-making episode. The journal is a historical record of the subject's reasoning for making a particular decision. Our analysis is made from a subsequent time perspective that enables us to look at the consequences and efficacy of the decision and reasoning.

Tacit Knowledge

The study of tacit knowledge begins with a physical chemist and philosopher named Michael Polanyi. Polanyi formally introduced the term and the theory, in his book, *Personal Knowledge*, in 1958. He continued to develop the concept in a later book, *The Tacit Dimension* (Polanyi, 1966) and in essays in 1969, 1966, 1964, 1962 (Polanyi, 1969). Since then, tacit knowledge has become of interest to many disciplines including management, psychology, education, and theology. We will briefly describe each of these disciplines use of tacit knowledge, but first, we will look at the concept as created by Polanyi.

Focal and Subsidiary Awareness

To Polanyi, all work or activity is a blend of what he called "focal" and "subsidiary" awareness. When we are attending to one thing, we always do so through other things. We are "focally" aware of the thing that we are attending to. We are only able to give "subsidiary" awareness to the things that we use in the process of attending to our work or activity. Suppose I attempt to provide an example. As I do this, I am focally aware of the meaning that I want to communicate to you, the reader.

Again, my focal awareness, or what I am attending to, is my example and its meaning. The only way I can accomplish this communication is to use many other things that I can only give subsidiary awareness to. I use a keyboard, pixels on a screen, vocabulary, grammatical knowledge, and much more, without focusing directly on them. Polanyi argues that if I do focus directly on these subsidiary things, I will no longer be able to accomplish what I set out to. In other words, I simply cannot attend directly to those things that I am attending through.

Polanyi describes a person using a hammer to accomplish a task as a simple example of these two kinds of awareness (Polanyi, 1958). He argues that while we are aware of both the hammer and the nail, we are aware of them in different ways. Polanyi writes, "When we bring down the hammer we do not feel that its handle has struck our palm but that its head has struck the nail. Yet in a sense we are certainly alert to the feelings in our palm and the fingers that hold the hammer. They guide us in handling it effectively, and the degree of attention that we give to the nail is given to the same extent but in a different way to these feelings. The difference may be stated by saying that the latter are not, like the nail, objects of our attention, but instruments of it. They are not watched in themselves; we watch something else while keeping intensely aware of them." (Polanyi, 1958, p.55)

Similarly, in management or strategy, the strategist is focally aware of an objective. Assume that a strategist is attempting to decide how to price a new product offering. The strategist's focal awareness is on pricing and markets. The strategist gives only subsidiary awareness to nearly endless minutia of past pricing, competitive offerings, economic measures and indicators, raw material cost histories, workforce detail, production functions, accuracy and source of market research, reaction of customer's buyers . . . Ad infinitum. This is not even considering the physical awareness; the focusing of eyes and use of reading ability, ears and listening, extracting information from language and sound, extending future meaning from the abstraction of defined numeric values, though all critical in accomplishing the objective, all can only be given subsidiary awareness. What will happen if the strategist focuses attention on these subsidiary elements rather than on the focal object of pricing? The strategist "looses focus" or has become distracted by "detail", or perhaps the vernacular partly captures an answer to this question, the strategist "looses the forest for the trees." The better and more sophisticated the strategist is at integrating these subsidiary elements with the focal object, the more tacit knowledge the strategist has.

Subsidiary Elements and Tacit Knowledge

The better our knowledge, or the more expert we are, the more sophisticated and comprehensive we are at integrating subsidiary elements. The better our skill, the more sophisticated and comprehensive we are at integrating things like distantly related detail, past experience patterns, individual movements, vision, etc, toward the purpose. The key here is that what makes the tacit component "tacit" is the idea that we can never be focally aware of all the subsidiary elements we use or draw upon to create meaning or to perform a skill, nor will we be able to articulate all the subsidiary elements we use. The collection of subsidiary elements that make a person an expert, or highly skilled, are largely learned through practice, emulating others, and experience. We can learn about strategy making by studying it, but we cannot learn to be a strategist unless we experience strategy making.

To advance in skills, or become expert, we must engage in "effortful study" (Starkes and Ericsson, 2003). Effortful study is a combination of thought and practice where we (a strategist in this case) continually place our self in situations just beyond our competence level. In doing so, we learn how to integrate more and more subsidiary elements into a meaningful combination that results in performance.

Polanyi includes a skill as a type of tacit knowing. This is of particular interest to us because the type of tacit knowledge that we are testing for in this paper is skill based. For a skill, the combination of many subsidiary elements results in meaningful performance. The way in which the subsidiary elements are related is in their coordination to achieve a purpose. Stated another way, meaning is a result of the particular way in which the subsidiary elements are integrated.

LITERATURE REVIEW

Psychology

In psychology, tacit knowledge is considered to be a special aspect of practical intelligence, which is itself a component of general intelligence. General intelligence, usually indicated by the lower case letter g, has been widely studied and debated. In fact, g is argued to be the construct that has received more attention and validation studies than any other (Brody, 2000). Many have debated the usefulness of "g" as predicting work performance. Partly in response to the failure of

“g” to explain performance, Robert J. Sternberg has argued for a triarchic theory of intelligence containing three fundamental aspects; intelligence-analytic, creative, and practical (Sternberg, 1985). Practical Intelligence is of interest to this paper because it “deals with the mental activity involved in attaining fit to context” (Sternberg, 1985, p.45). Practical intelligence is also of interest because it is dependent upon tacit knowledge. Sternberg presents strong evidence that tacit knowledge is a special aspect of practical knowledge that explains individual differences in performance – differences that can not be explained by other measures of g (Sternberg & Hedlund, 2002). A working definition of tacit knowledge in the literature in psychology would be the *informal, implicit knowledge used to achieve goals* (Sternberg, Wagner, Williams & Horvath, 1995).

Education

In education, researchers have adopted the definition and theoretical propositions developed by the psychology literature (see above) to develop scales for measuring tacit knowledge, and to study the impact of tacit knowledge on student learning (Leonard & Insch, 2005; Somech & Bogler, 1999). In this work, the use of tacit knowledge appears to be related to socio-economic status and student achievement. Further, it appears that tacit knowledge is gained through extensive experience and individual actions in a domain specific context (Leonard & Insch, 2005). Teacher education and teaching style are proposed to deeply involve intuition, which often takes the form of tacit knowledge (Torff, 1999).

Theology

In theology, there exists an ongoing debate about the use of Polanyi’s concept of tacit knowledge in supporting the concept of “spiritual literacy” (Taggart, 2002). Spiritual literacy is about the ability of a person to critically investigate (and learn) religious truth-claims. A challenge presented in this literature is how to avoid the dogmatism that can follow a strictly realist ontology yet also avoiding the relativism which similarly follows an experiential or phenomenological method. The basic tenets of Polanyi’s theory are debated as a possible solution to this challenge.

Management

Tacit knowledge is a key concept in the management literature. Argyris (1999) stated that, “. . . tacit knowledge is the primary basis for effective management, and the basis for its deterioration” (p. 123). In the strategic management literature, tacit knowledge is described as a necessary key to sustained competitive advantage (Lubit, 2001). Tacit knowledge is also considered to play a critical role in the creation of an organization’s knowledge (Nonaka & Nishiguchi, 2001). Of special interest to our study, tacit knowledge is considered to be a fundamental basis for skill-based actions, be they by management or labor.

HYPOTHESES AND METHODOLOGY

As discussed earlier, we argue that a better way to test and understand tacit knowledge is to understand the level of sophistication and integration of subsidiary elements in use while an expert is attending to a focal object. In our study we do this using a journal. The journal that we used is a historical record of the subject’s reasoning for making a particular decision. By deconstructing the language and situation described in our subject’s written journal during a

specific decision-making episode we can identify the subject's focal object as it should be explicitly present in the narrative. Since the journal we use in this study was the subject's way to record key decision-making episodes, the journal should describe what the subject was focusing on.

Hypothesis 1:

There will be a specific focal object that is explicit in the subject's narrative. As described earlier, a basic proposition of tacit knowledge is that the expert cannot attend to subsidiary elements while attending to a focal object. As the subject in our study was attending to a focal object, s/he would have been doing so through subsidiary objects. To put it in the language of an earlier example, the subject will be using a "hammer" (subsidiary) on a "nail" (focal). The subject will not refer to the "hammer" directly.

Hypothesis 2:

There will be key subsidiary objects in use which will not be explicitly present in the narrative. We first narrowed the decision-making episodes in the journal to those where the subject was obviously describing or making a decision of some consequence. From these, we randomly chose one entry for analysis.

RESULTS AND DISCUSSION

The decision-making episode we chose was an entry from 2006. The subject was discussing a new product that his firm had recently commercialized. We will use [new product] rather than the product's brand name, change the name of the participants, and change the company name to ACME for confidentiality reasons. The decision-making episode was the subject's decision to force the sales force to present the [new product] to ACME, even though ACME hadn't asked to see the [new product] and the sales force didn't want to. The [new product] had not been adopted by any consumer goods firms at the time of the journal entry. Here is the entry which describes the situation (decision-making episode).

"Strangely, sales has been the last to see even the obvious potential. James was very upset that I forced him to drop off (with me) the [new product] at ACME . . . "

"One, he didn't think the [new product] looked good enough for retail, two, he didn't think we were capable of making it, three, he wanted to wait for ACME to ask for the [new product] and to ask for us to come see them again."

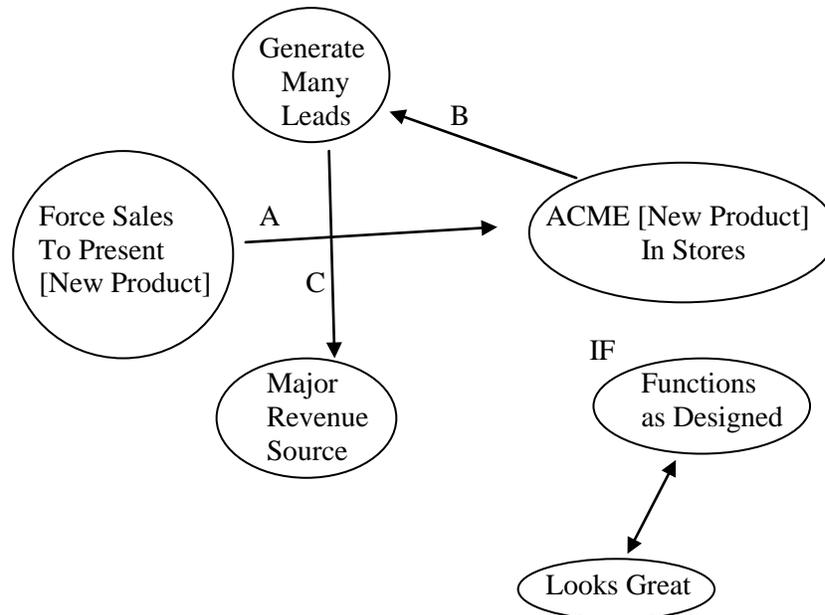
The remainder of the narrative which we will discuss follows.

"When ACME sees the [new product], and when it functions as designed, and when it looks as good to ACME as I know it will, they will adopt it."

"If we can get the [new product] in one retail situation, look out. The timing is good, just prior to the ___ expo which we will be showing at Rosemont in Chicago. We are planning on screening carefully at the show for retail brand managers. The [new product] in just one retail setting will generate a tremendous number of leads, more than the show I'm certain. This will also position the [new product] as a major revenue source. No one understands how pivotal this really is."

To assist in deconstructing the narrative, we have diagrammed the concepts included in the narrative in Figure 1.

FIGURE 1
NARRATIVE OBJECTS



The focal object in the narrative seems to be to force sales to present the [new product] to ACME. There is a kind of sequence that is implied which can be seen in Figure 1. Forcing sales to present the [new product] will lead to the [new product] being in stores (retail), which in turn will cause the generation of many leads, and finally, the [new product] becoming a major revenue source. The subject believes that the sequence will occur as long as the [new product] functions as designed and looks great. To continue the hammer and nail analogy, forcing sales to present the [new product] is a bit like the nail, the focal object. The nail's purpose, to fasten lumber, building a wall, then the frame of a house, then finally the house, is much like the subject's sequence of events that the [new product] presentation is a necessary part of. There does seem to be support for hypothesis one. The subject is attending to a focal object. Interestingly, the focal object is situated within a context of object linkages, all of which are necessary for the focal object to have meaning.

A way to think about the presence of subsidiary objects, whether mentioned in the narrative or not, is to think about the lines in Figure 1. The only consideration given to lines A, B, and C, is "functions as designed", and "looks great". Are there necessary objects missing in order to explain line A? What must be true in order for ACME to adopt the [new product] and place it in stores? That the [new product] functions as designed and that it looks great? Are there additional objects that would be required? Yes, there almost certainly are. The [new product] must necessarily have some efficacy or value for ACME. It must have some kind of fit within ACME's strategy and product line. It seems that a fairly deep understanding of ACME's product line and strategy would be necessary for our subject to "use" line A without focusing on it directly.

We can ask precisely the same question for lines B and C. What must be necessary for the presence of [new product] in stores to cause “generate many leads?” What must be necessary for “generate many leads” to result in a “major revenue source?” The knowledge that is involved at this level, was not being actively attended to by the subject. Yet, this knowledge is absolutely a required part of the subject’s performance. The knowledge necessary for the lines or links between the explicit objects is knowledge that was being used without being focally attended to. This knowledge was subsidiary. This knowledge was tacit. Clearly, the subject was attending to focal objects through subsidiary objects which were not present in the narrative, providing support for hypothesis two.

LIMITATIONS AND FUTURE RESEARCH

There are significant limitations involved with using archival evidence such as a journal in a study like this. One is that we are assuming that the subject recorded all the focal objects he was considering. This may or may not be true. We do believe that since the subject was specifically using the journal to record his thoughts about key decisions, it is likely that he did record at least the most salient thoughts and focal objects “in mind”.

Another limitation is that we are dealing with a sample of one that, strictly speaking, was not randomly selected. We cannot assume that our sample of one is a representative expert. The problem that this creates is somewhat limited as we did not set out to generalize, but rather look to see if one can usefully look to a narrative for evidence of subsidiary objects. It is particularly useful to understand that looking for the consequences of tacit knowledge may not be the only way to find it. For one thing, our method does not contain the circular logic problem inherent in the traditional (consequences) method. For another, the presence of tacit knowledge should never be considered to guarantee high performance. Tacit knowledge may or may not lead to higher performance. It may be better or worse, more accurate or less accurate, more relevant to the use it is put to or less relevant.

The value of this study is that it suggests a more useful way to study tacit knowledge. The method that we propose should be considered worthy of additional consideration and testing. Can archives of email communications be used to study tacit knowledge? Can verbal communications be used as well? Can a discussion of the subsidiary objects in use help the expert understand or sharpen her or his knowledge? Questions like these remain for future research.

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