Practical Techniques for Complex Knowledge Transfer: A Case Study

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Abstract

Knowledge Management practice is heavily preoccupied by the problems, processes and technologies associated with explicit knowledge transfer. However, much of the most important knowledge to organizations resides in the heads and abilities of people, and is extremely difficult to transfer.

This article reports on a research project that was focused on using practical techniques for eliciting and representing a particular form of complex, tacit knowledge described as "knowing as sensing". It outlines the processes and methods used in the project to build realistic, complex and ambiguous case studies for businessmen who want to acquire greater sensitivity to the China business environment, using the input of experienced China hands. A technique for facilitating the final stage of knowledge transfer, internalisation, is also described.

In the summer of 2003, the Singapore Institute of Management (SIM) commissioned Straits Knowledge, a knowledge management consulting and research firm based in Singapore, to conduct a research project on the challenges faced by Singapore small and medium businesses attempting to do business in China. What was curious about this decision was the selection of research partner. Straits Knowledge would not be a usual suspect for such a study. It has no special portfolio in market intelligence research, nor does it have extensive expertise in understanding the China market. Why would SIM choose a knowledge management specialist for such a project?

In fact, the choice of research partner came from SIM's characterization of the learning problem faced by Singapore businessmen venturing into the China market, as a problem of *complex* knowledge transfer (requiring knowledge elicitation and representation techniques), rather than a problem of *information* transfer (such as that provided by analytical research methods).

Businessmen in China face primarily context-rich and context-specific knowledge problems of how to sense and respond to what's happening in the fast moving economic, social, and regulatory environment around them. Information and explicit analysis matter, of course, but there is no lack of such material, and there is a more basic problem that if you can't "read" your environment effectively, no amount of such knowledge will help you, because you won't know when or how to deploy it. What's lacking is a vehicle for gleaning and easily transferring the hard-earned insights and judgements of experienced foreign managers and entrepreneurs in China, to lower the learning cost and increase the learning speed of novices to this environment.

In this article, we examine the methodology used in conducting the research study, *Challenges of Doing Business in China* (Lambe and Tan, 2003) explicitly to pursue this goal, and the rationale for the techniques used. First we'll explore in a little more detail the knowledge management issues behind such knowledge transfer problems.

The Problem of Complex Knowledge Transfer

Much of knowledge management practice, processes and technology is spent looking at problems of explicit knowledge transfer. Issues of content management, taxonomy construction, metadata, search technologies and processes for what is infamously termed "knowledge capture" dominate the KM practitioner's awareness horizon.

Complex knowledge transfer is a much trickier, but actually far more important issue. What do we mean by complex knowledge? Theoretically speaking, this term could sit well with the now standard distinction between explicit (codified) knowledge and tacit knowledge (embedded in people's abilities, perceptions and experience). However, the term "tacit" has become a somewhat hackneyed term, and as happens with hackneyed terms, becomes so loose that it communicates little of use to the practitioner. The term "tacit knowledge", if truth be told, more often connotes "not explicit knowledge" than anything else.

So we need a slightly more specific term to help us. Practically speaking, let us define complex knowledge as the kind of knowledge that is accrued by human beings, and is important, but is difficult to codify or transfer.

Some complex knowledge is psycho-somatic – an example would be the expert machinist's manual and sensory skills accrued over years of practice. He "knows" things about the things he is making, simply by interacting with them, that a novice would require sophisticated measurement techniques and technologies even to approach.

Other kinds of complex knowledge might relate to the ability to improvise creatively and appropriately in changing and uncertain environments, or to be able to sense and respond to emerging or weak signals in a complex and "noisy" environment. Mark Twain thought he could learn how to be a Mississippi river pilot by studying charts and manuals. In fact, he discovered, it would take several years of apprenticeship to an experienced river pilot and countless journeys over the same terrain to be able to "read" the meaning of the eddies, currents and water-levels of the ever-changing river in always-different circumstances (Twain, 2001).

This kind of complex knowledge is the sort of thing we expect to have in a seasoned and experienced senior executive or CEO (Weick and Sutcliffe, 2001; Sutcliffe and Weber, 2003). In our particular case, this is the kind of knowledge that it would be very useful to acquire quickly in a business environment like China.

There are other kinds of complex knowledge, of course, but for the time being let's focus on these two, and construct a working definition: complex knowledge for our purposes will mean the kind of knowledge that we accrue by long experience, that gives us ability to act (know-how) or ability to sense and make meaning (know-that), to a much higher degree than less experienced people can.

What this definition gives us (which tacit knowledge does not) is the ability to focus on types of hard-to-transfer knowledge, that give competitive advantage. There are clear business problems behind both types of complex knowledge: if you can find better ways of transferring this knowledge you can transfer internally the skills and the benefits of experience much faster than your competitors can, you can make sure that at least some of

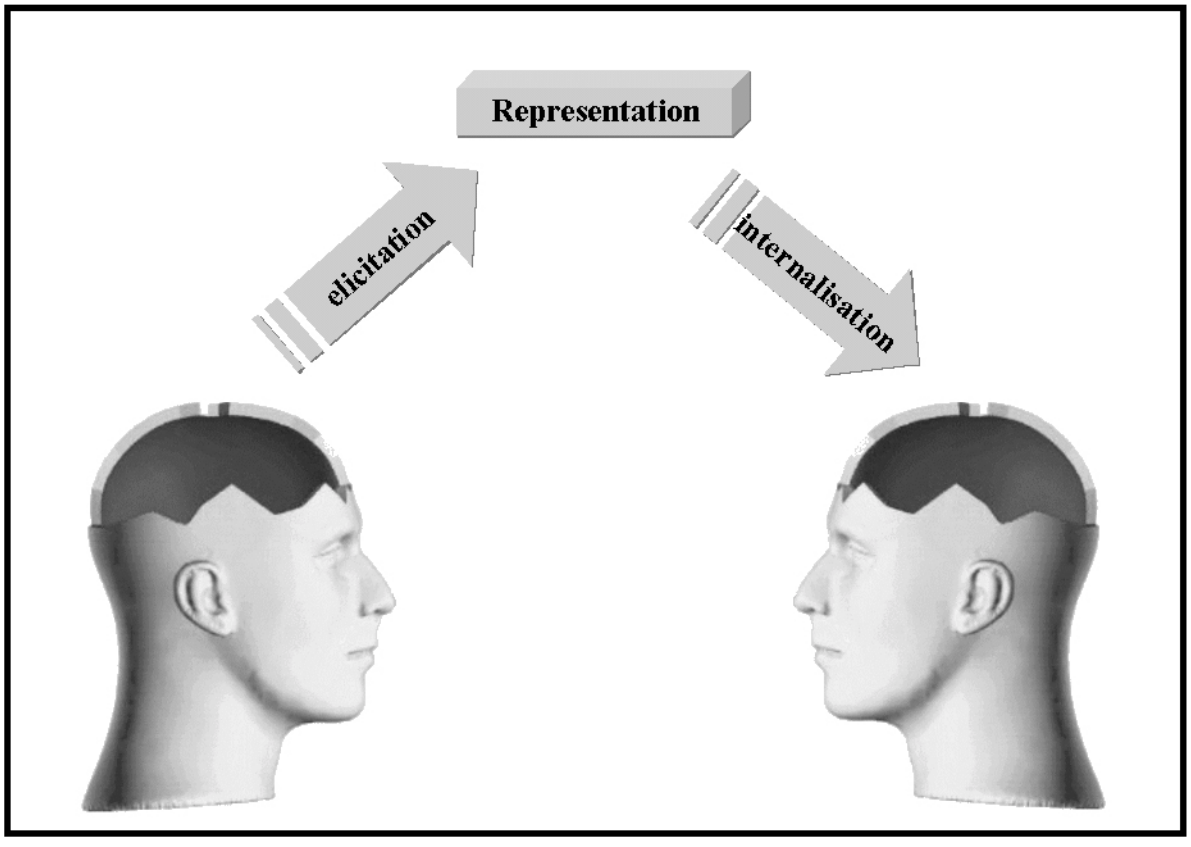
what your CEO "knows" remains in the organisation when she leaves, and you can minimise the cost of learning in new or changing environments (this cost includes the cost of failure).

As we've already pointed out, explicit knowledge is fairly easy to transfer, and well-designed technology solutions can support this transfer reasonably effectively. Because explicit knowledge is reasonably unambiguous if delivered to appropriate user groups, "knowledge transfer" effectively means "knowledge delivery", and there is little attention paid to the internalization process on the part of the recipient. To read is to understand.

Complex knowledge however, of its nature raises additional questions when it comes to considering transfer. First, the complex knowledge has to be coaxed into a visible form (however depleted of richness that form may be) that can be manipulated by other people. Then it has to be codified or represented in a way that carries as much as possible of its originating context with it. Even after "delivery", we need to worry about the processes that facilitate its internalisation. The knowledge representation needs to be shaped in a way that makes it "sticky" and digestible, so that it can be internalised and layered into the recipient's directly acquired knowledge and experience.

We can represent these key stages (and problems) as elicitation, representation and internalisation. Each of these has their theoretical issues, not least of which being the relative success of the representation in "carrying" knowledge, or even the measurability of that capacity. However, as a practice-oriented research report, we present here only sufficient theoretical orientation to explain the methodology used in our case study.

Figure 1. The Stages of Complex Knowledge Transfer



While there is much theoretical debate on tacit or complex knowledge transfer, the provision of practical techniques for eliciting, representing and internalising complex knowledge is fairly thin (Nonaka and Takeuchi, 1995). For reasons that become obvious fairly quickly, the military have been among those most interested in this problem. If they can artificially transfer complex combat knowledge without having to put everybody through real, repeated, combat experiences, they'll reduce the cost of learning, which in their terms corresponds to body count (Klein, 1999).

In the *Challenges of Doing Business in China* project, Straits Knowledge used a sequence of techniques to address the key stages of the complex knowledge transfer process. We'll now take each stage, and discuss the approach used.

Knowledge Representation

Our first issue was to decide the form in which we would represent the knowledge of people experienced in the China market. Even though this is the middle stage in the process, as will become apparent, this decision would allow us to determine the most appropriate elicitation and internalisation techniques.

We decided fairly quickly that a narrative-based format would be the most likely candidate for knowledge representation. There is already a large and growing literature on the uses of narrative to represent and transfer complex knowledge. One of the reasons for this interest is the ability of narrative to economically but effectively represent the context within which complex knowledge can be understood (Denning, 2001).

As the anthropologist Edward Hall pointed out a generation ago, one of the main reasons why rich or complex knowledge is difficult to transfer, is that it has too many embedded and implicit connections to the originating context of that knowledge (Hall, 1971). Narratives are very good context packagers: they typically manage to convey situational context, social context and teleological context (where the plot comes from and where it's heading) in a relatively communicable form.

Narratives, in the form of case studies and simulations, also have a very respectable history in management education with the explicit goal of achieving the transfer of experience by proxy (Gragg, 1940; Corey, 1996; Harvard Business School, 1997). Ostensibly, this was very much in line with our project goals.

However, both case studies and simulations had different drawbacks for our particular representation needs. One of the characteristics of the business context in China for novice businessmen there, is the uncertain and ever changing environment. They are multi-factoral contexts, where what matters is your ability figure out on a rolling basis what factors you should be paying attention to at the present moment, and what factors you can safely ignore.

Case studies in their traditional form tend to be mono-factoral – they represent a context around a key issue or set of pre-identified issues, and this context is made the basis for systematic and explicit analysis. They therefore do not support the "knowing as sensing" requirements for the transfer or internalisation challenge we had identified.

Simulations are slightly better vehicles in terms of the number of variables that can present themselves to the recipient, and they have the added advantage of simulating the unfurling of events through time and of allowing the players to experience the consequences of their actions through time. However, simulations, however sophisticated they might be, are ultimately closed, defined systems, where all of the options have been pre-analysed and judgements have been made on what (invariant) results are produced by player decisions. Simulations, because of their complexity, are also expensive to build.

Because they are fundamentally closed and defined, simulations therefore find it difficult to mirror the uncertainty and ambiguity of fast changing and difficult environments, where there are probably no clear answers or definitive decisions, but only more or less dysfunctional ones. They also tend to be action-oriented (you have to decide what to do) and there is nothing that more easily distracts a pragmatic entrepreneur from the difficult task of "knowing as sensing" than providing him with the ability to take action.

The narrative form we eventually took as our model, the decision game, actually falls somewhere between a case study and a simulation. Like case studies, they present you with a well-defined initial context, events which you cannot yourself modify, and a central dilemma to reflect on. Like simulations, they unfold sequentially and invite response and interpretations as you proceed through them.

But there are key differences. Unlike case studies, they more closely mirror the complex, uncertain and ambiguous unfolding of events in the real world. Unlike simulations, you don't get the chance to systematically explore different, well-defined option routes, and you are compelled to focus on the "knowing as sensing" requirement of our internalisation challenge.

Originally developed as "Tactical Decision Games" by the US Marine Corps for training purposes, the decision game form has been most actively researched and developed for knowledge and experience exchange purposes by decision research company, Klein Associates. Gary Klein describes them thus:

"Decision games are a centrepiece of a mental conditioning program, simple thought exercises… that capture the essence of a typical, difficult decision. A decision game presents some details leading up to a dilemma, typically charged with lots of uncertainty, and challenges those taking the exercise to come up with a plan of action." (Klein, 2003:35)

In our case, we have taken the decision game to represent not a single decision, but a complex scenario full of uncertainties and ambiguities and competing forces, together with the requirement to chart a clear course of action – characteristics very typical of doing business in general.

The six decision games that make up the final research report represent six cases, covering different types of enterprise and different locations in China. The scenarios are presented in the form of numbered, sequential events. The player or players are put into the position of the Singapore businessman (or woman) in the case, and as they read the events, they are required to evaluate the significance (positive or negative) of the event for their business interest. When we look at the internalisation stage, we'll see how that addresses our "knowing as sensing" requirement.

Knowledge Elicitation

Once we had determined the form of representation we wanted to use to package the complex knowledge we wanted to transfer, we needed to elicit the appropriate forms of that knowledge. As novices ourselves, we needed first to get a general sense of the knowledge landscape of doing business in China, and orient ourselves to the main features of that landscape. We therefore took a four stage approach: (1) Orientation (2) Elicitation (3) Composition (4) Validation.

Orientation: To identify the key issues in the Chinese business environment, we conducted two focus groups involving nineteen Singapore entrepreneurs and managers who had had experience working in China. In these focus groups we asked participants to give accounts of their own experience and of other Singaporeans they knew of. Staying true to the reliance on narrative to communicate implicit context, we were explicitly seeking anecdotes or stories in these focus groups, often against the disposition of participants to give us distilled, analytical summaries of key lessons and principles, devoid of context.

The participants were then asked to group their examples and stories into broad themes, using an affinity clustering technique, and to mitigate observer bias, they gave their own terminology to the themes. We consolidated the themes that emerged from the two focus groups into six broad themes – Strategy, Environment, People, Culture, Law, Fraud – based on the focus group conclusions.

What this gave us was an organising framework for exploring the China business context in greater depth, as well as a large body of anecdotes and examples as raw material. Our next step would be to elicit some much more context-rich experience and knowledge.

Elicitation: With the six themes that emerged we went on to conduct confidential interviews with 16 managers or entrepreneurs who had also had substantial experience working in China, each one exploring one or two of the themes in greater depth. These interview materials form the second, more detailed source for the case studies.

The interviewees were assured of confidentiality in order to reduce their inhibitions about disclosing information about challenges encountered by themselves or their organizations whilst working in China.

The structure of the interviews typically started with a focus on one or two of the key themes identified by the focus groups. We then asked the interviewee to describe a situation where a Singapore manager or entrepreneur had found themselves in a challenging situation.

One of our main challenges here, was to be able to have as much as possible of the context of these situations to be divulged. To help us understand the various aspects, causes and dimensions underlying these (often complex) situations, we used a knowledge disclosure technique known as “the play of life” – a technique originally developed to help counsellors understand complex personal problems and situations (Raimundo, 2002).

In visualising the situation that expressed the focal theme our interviewees wanted to talk about, we asked them to display the scenario on a table in front of us using small figures and props that represented the different roles and relationships in the scenario (situational context). The interviewee was asked to describe each of the roles being played in the situation, and to explain the relationships as displayed before us (social context). We also played the scenarios forwards and backwards, asking questions such as "Let's imagine it turns out well/badly – what would the situation look like then?" (teleological context).

Using this technique we were able to explore the situation from a number of different perspectives, including alternate ways in which the situation might be addressed. More importantly, the visual, imaginative and kinesthetic modes of representation in this technique enabled us to release and record more of the contextual understanding that came from the interviewee's experience in China, than would have been possible using linear, structured interview techniques. We documented the interviews by taping them and by photographing the different scenarios.

Composition: We were now ready to start the composition process. We had previously established a framework for our case study coverage. We wanted the research report to give examples of representative types of business going into China to do business (trading companies, manufacturing companies, service companies, etc), to cover the main themes unearthed as common challenges in our focus groups (Strategy, Environment, People, Culture, Law, Fraud), and to ensure a reasonable geographic spread looking at conditions in different parts of China. We therefore defined six "shell scenarios" setting the parameters for each case: company type, main challenges faced, location.

We had assured our interviewees of confidentiality, so the contextual and situational knowledge we had elicited needed to be abstracted from the original scenarios they had described, and painted into new, artificially constructed ones. This was to be a particularly strong test of the strength and richness of the contextual knowledge we had elicited, which was largely subjective. To be realistic, our context reconstruction for the decision games required further research work in gathering objective and factual information (explicit contextual knowledge) about how particular regions and industries currently operate in China, using publicly available news reports, analyst reports, and other published materials.

Our aim in constructing these fictional organizations was to create contexts that would be realistic and recognisably Chinese, within which the themes we had identified might be expected to play out in the way that we describe them.

The decision game construction also had an underlying framework and set of operating principles. Some of these relate to the "knowing as sensing" internalisation requirement, and some of them relate to narrative techniques in general. We selected decision games as a genre because they form a useful way of testing one's judgement, knowledge and experience while engaging with business challenges in a complex and ambiguous environment. We needed to represent complexity and ambiguity in realistic ways to satisfy this.

In addressing complexity, narrative experts note that in such environments, there are typically many different "sub-plots" all playing out in parallel: whether they be personal relationships, issues internal to the organization, external factors inhibiting or encouraging us, forces of nature as well as of society or individuals, motivations and rivalries, alliances and other

relationship-oriented play-offs (McKee, 2003). This approach meant that for a decision game of 25-30 steps, we would typically weave three to five such sub-plots into the games, aspects of each emerging at different stages. This complexity requirement incidentally means that it is difficult to evolve satisfyingly complex narrative-based decision games in fewer than 20 steps.

To address ambiguity we relied very heavily on the contextualisation questions we asked our interviewees about how they read significance into the different scenarios they described. We needed to identify issues that novices would not recognise, but that an experienced person would. At the composition stage, we needed then to present events in relatively ambiguous ways, such that it would require a degree of sensitivity to that context to detect that it might be an early or weak signal of a potentially significant event. The ability to represent ambiguity is a key requirement for a successful decision game that is focused on the "knowing as sensing" challenge (Klein, 2002).

Validation: Our final step was to validate our decision games with known China experts and commentators, whom we interviewed individually on each decision game. We asked them to check for inconsistencies or inaccuracies, as well as verisimilitude. We then asked them to comment on four questions:

- What has the Singaporean businessman done right in this case?
- What mistakes has the Singaporean businessman made?
- What could they have done differently?
- Given their present situation, what should they do next?

This task fulfilled two functions. First, it provided analytical commentary on the cases in the traditional format for individuals who needed validation of their own perceptions as they read the case. Secondly, it acted as a test of authenticity, in that the close assessment of the protagonist's actions and decisions by experts would quickly expose uncharacteristic behaviours or a poorly communicated contextual understanding.

Knowledge Internalisation

Thus far, we had addressed the knowledge elicitation and representation issues. We had not yet fully addressed the internalisation issues. As the report was to be issued in print format and sold as a booklet, it needed to be able to stand alone, independent of any other process. Our introduction to the report therefore described the use and purpose of decision games, and suggested how readers should progress reflectively through the cases assessing each step in turn, before proceeding to the next, and then checking their perceptions with the analytical commentary at the end of each game.

However, we also produced a game pack to be used in group sessions, for greater sensitisation and internalisation of rich contextual knowledge. In this format, the initial set-up scenario is presented to a group of 6-10 people of varying degrees of experience, sitting around a table. Each step of the decision game is printed on separate situation cards, which are placed in a stack face down on the table. The group reads each step in turn, and must negotiate an agreed perception of the significance of that step ("Is this good, bad or neutral for your business?"), and then record their collective decision on a chart, before proceeding to the next step.

At one level, the requirement that there be an agreed perception is an artificial device, which leads some participants to believe that their task is to find a "correct" perception. But at another level, this is a powerful engagement and elicitation device. If the decision game is sufficiently complex, realistic and ambiguous, different participants will read very different perceptions into the scenes as they unfold.

Compelling them to negotiate an agreed perception means that they are required to explain their divergences, thus eliciting from the members of the group itself very high levels of complex, highly contextualised knowledge. One of the interesting outcomes of this internalisation technique is that it facilitates complex knowledge transfer not merely from originators of the case material to the readers of the case material, but also *between* participants in a socially-mediated internalisation activity such as we have described. This is why it is useful to have different levels of experience in the target group for such activities.

Essentially, then, the internalisation problem is of how the represented knowledge can be recontexualised so that it makes sense within the recipients' own world view. While individual readings can go some way to this, the socially mediated methodology and the "must agree" instruction gives much greater scope for eliciting the recipient's context into consciousness, and for knitting the new knowledge into the recipient's context in a more durable and integrated way.

If engagement levels were evidence of effectiveness, this is a very effective technique. Based on our experience in this and similar projects in different areas of knowledge transfer, a thirty step decision game will take a moderately experienced group up to three hours, more or less without break, including additional group reflection, feedback and learning activities. Each decision game will generate very different perspectives and viewpoints, and active knowledge exchange even between individuals of quite disparate experience.

Conclusions and Future Directions

We initially described the *Challenges of Doing Business in China* research project as a case in facilitating complex knowledge transfer, specifically focused on the transfer of "knowledge as sensing". After describing the three key processes in complex knowledge transfer (elicitation, representation and internalisation) we described three practical and relatively under-exploited techniques for facilitating those processes: in elicitation, the play of life; in representation the decision game format; in internalisation the group negotiation activity.

As a research report with theoretical underpinnings in knowledge management, this project leaves much more to explore and consolidate. One of the difficulties of this technique, a difficulty that suggests scope for further practical research, is the difficulty of measuring the effectiveness of knowledge transfer using these techniques. Theoretically, this is straightforward enough. Since we are focused here on the transfer of "knowledge as sensing" in order to become more able in a new environment, we could look to performance improvements between experimental and control groups as evidence of effectiveness.

However, in practice, it is unlikely to be straightforward. The complex knowledge being transferred is itself subtle and intangible, and performance in new and uncertain

environments relies on numerous causal factors, not merely more confident “sensing” abilities. Moreover, the mechanisms we have described are very open and generative, but therefore generate very divergent results, responses and perceptions from different individuals. Pragmatically oriented individuals are particularly prone to want to turn the decision game into a simulation and make and explore alternative decisions, resisting the “knowing as sensing” focus. Much more experimentation and observation needs to be done in this area. We hope that this project makes a useful start.

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