Transferring Specialized Knowledge: Accelerating the Expertise Development Cycle

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ABSTRACT

One of the biggest challenges facing organizations today is how to capture the knowledge of departing experts and transfer that knowledge effectively to their successors or other parts of the organization. Without effective knowledge transfer, these valuable lessons learned and best practices are lost. This is especially difficult in two situations—at senior levels in organizations and with positions that are in niche specialties. The knowledge in each of these areas is so specialized that only a few people have the knowledge, yet it's knowledge essential to the organization. The tacit knowledge of an expert is difficult to capture and transfer effectively because it involves deeply-embedded skills that the expert may not even be consciously aware of using. While many organizations have learned to capture tacit knowledge at lower levels of the organization successfully, they still struggle with transferring the senior-level and specialty knowledge into learning.

This paper looks at a case study of more than 50 top-level executives, organizational leaders, engineers, and scientists at Fortune 500 companies and military organizations. It outlines an effective process for enhancing knowledge transfer at the senior levels of organizations, including methods to capture tacit knowledge more effectively and efficiently and empower leaders to retrieve that knowledge in a way that promotes effective learning. This paper also discusses the impact of levels of expertise on knowledge transfer, challenges with transferring knowledge from experts to less experienced individuals, and why transferring knowledge from an expert directly to a novice usually results in failure. Best practices are identified for capturing key specialty knowledge, analyzing and documenting key knowledge, and multiple methods to transfer knowledge both one-on-one and as larger scale training to accelerate the expertise development cycle.

ABOUT THE AUTHOR

Holly C. Baxter, Ph.D., is co-founder and Chief Scientist of Strategic Knowledge Solutions, Inc. She has spent more than 15 years specializing in Instructional Design, Evaluation Metrics, Organizational Development, and Training in both military and commercial environments. Her experience includes developing assessment methodologies for improving communication flow and organizational learning across countries and cultures, designing training for enhancing situational awareness in high-stakes situations, designing embedded training solutions for Soldiers, and developing evaluation metrics for cognitively-based training. Holly is a certified Knowledge Management professional and Six Sigma Black Belt. She has worked as a senior advisor and consultant for the United Nations Development Programme, World Bank, U.S. Army, U.S. Marine Corps, Harvard Business School, and multiple Fortune 100 companies.

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INTRODUCTION

One of the biggest challenges facing organizations today is capturing the knowledge of departing experts and transferring that knowledge effectively to designated successors. Without effective knowledge transfer, valuable lessons learned and best practices are lost. This is especially difficult in two situations: at senior levels in organizations and with positions that are in niche specialties. The knowledge in each of these areas is so specialized that only a few people have the knowledge, yet it is essential to the organization. The tacit knowledge of an expert is difficult to capture and transfer effectively because it involves deeply-embedded skills that the expert may not even be consciously aware of using. While many organizations have learned to capture tacit knowledge successfully at lower levels of the organization, they still struggle with transferring the senior-level and specialty knowledge into learning.

There are about 76 million baby boomers, those born between the years 1946 and 1964. According to Census Bureau data, 3,463,670 baby boomers, or an average of 66,600 a week, turned 62 in 2010 and were eligible for Social Security (Knight, et al., 2010). With the escalating rate of retirement, companies are facing a widespread and comprehensive loss of knowledge. Add to that the hundreds of thousands of experienced workers whose positions were victims of the economy, and the result has been a brain drain that might set an organization back years (Durst, 2012).

The U.S. business community, government, and military are facing a war of intelligence attrition. Fortune 500 companies are seeing countless experienced knowledge workers walk out the door, and this will continue over the next two decades. The U.S. military is losing millions of officers and key personnel to retirement and down-sizing. Some 900,000 white collar workers from the executive branch of government, along with another 5,400 federal executives, will be up for retirement by 2016 (Schmitt, et al., 2010).

The brain drain is worst when it comes to top executives and high-level specialists with unique skill sets. In these areas, many organizations are only one or two people deep, making it even more of a hardship on the organization when someone leaves. During an interview, one CEO described the dilemma by saying, "The least experienced of the ten top executives that retired in 2012 had been with us for 32 years. Over 275 years of intellectual capital walked out the door with them, which hurt internal operations, customer service – everything, really."

Our challenge in this study was to find an effective way to both capture and transfer that critical tacit knowledge before it walks "out the door," and then to accelerate the development of expertise in those who remain.

Participants and Methods

Because tacit knowledge capture and transfer is most difficult in specialty and top-level positions, we focused our study on these areas. The goal was to discover if non-procedural knowledge, such as strategic thinking, situation awareness, prioritization, and decision making, could be captured and transferred effectively. We conducted interviews lasting from two to 16 hours with more than 50 top executives, scientists, engineers, military members, government leaders, and specialists. Our participants had between 22 and 41 years of experience in their fields, and many had been with a single organization their entire career.

Positions of the participants included CEOs, Vice-Presidents, top scientists and engineers in their respective fields, and military and government leaders and specialists. In each case, the participant was identified by key people in the organization as having a skill set that was both unique and critical to the company.

Based on the trial and error during these interviews, we developed a process that was workable for all positions and can be used in any organization to capture tacit knowledge and transfer that knowledge effectively.

The Process for Transferring Tacit Knowledge—24 Hours to Capture 40 Years of Strategic Knowledge

Most organizations attempt to capture the critical knowledge of their employees, and then share that knowledge through formal or informal learning methods. Where knowledge capture is often overlooked is with the highest level employees and those in specialized positions. For example, one company had an expert in developing new products, and while even the people who worked alongside him for years knew he was the best, they couldn't explain what he did differently that made him so good at his job. This difference in how he thought was what took the company from being merely successful to being a world leader in the field. His colleagues noted that if this knowledge left with that individual, the entire company would feel the effects.

This process was designed to identify those experts, capture the tacit knowledge that makes a difference to the organization, and transfer that knowledge to key individuals. The process, shown in Figure 1, highlights key areas that prevent organizations from successfully capturing and transferring tacit knowledge, including clearly defining the goal of knowledge capture, how knowledge will be used, and who would use it; a format and method for capturing, analyzing, and documenting knowledge; formal and informal methods for sharing knowledge; and deliberate practice mechanisms to accelerate the development of expertise.

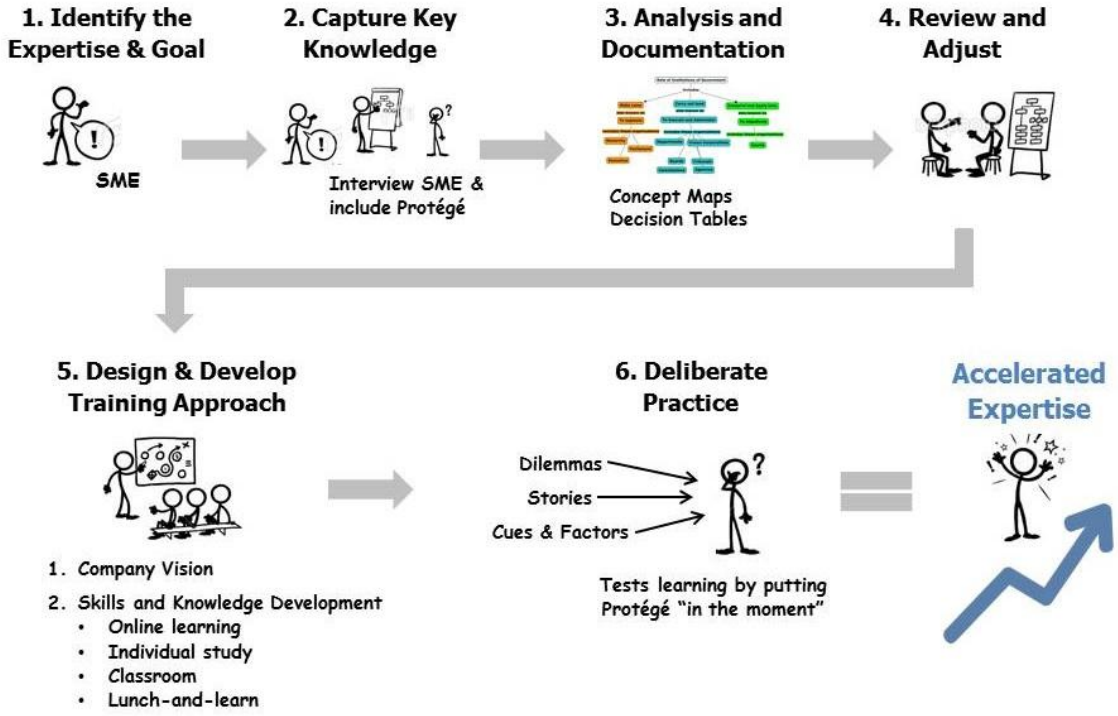

Figure 1. Accelerated Expertise Development Cycle

1. Identify the Expertise & Goal

The first step is to define the expertise you are seeking to capture and set a goal for the session. Often, organizations want to capture what an expert with 30 years of experience knows, but they fail to define what specifically about the expertise is of interest and what will be done with the knowledge after it is captured. To be effective, an organization needs to look at both the expertise level of the Subject Matter Expert (SME) and the expertise level of the person to which the knowledge needs to be transferred.

There are five basic levels of expertise: Novice, Advanced Beginner, Competent, Proficient, and Expert (Ross & Phillips, & Cohn, 2008). We found that knowledge transfer occurs best at one to two levels below the expertise level of the interviewee. In other words, transferring knowledge from an Expert to a Competent professional is more effective than transferring from an Expert to a Novice. A Novice, on the other hand, would learn best from an Advanced Beginner or a Competent professional. This difference is explained by how knowledge shifts from operational explicit knowledge at the Novice and Advanced Beginner levels to more strategic level tacit knowledge at the Proficient and Expert levels. A good example is capturing the expertise from Sully Sullenberger, the heroic pilot of US Airways flight 1549, who in 2009 landed his disabled plane in the middle of the Hudson River saving all 155 passengers and crew aboard. The pattern base of experience Captain Sullenberger had to pull from was huge—built from over 30 years of flying experience. A novice pilot wouldn't have built a foundation of patterns to know what to do with the information. For the same reason, people learn to cook scrambled eggs before learning to make a soufflé.

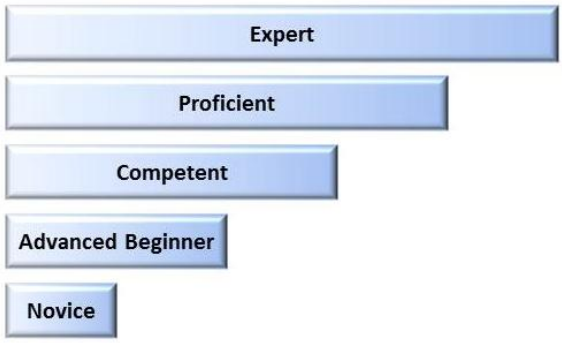

Figure 2. Five Levels of Expertise

To determine your goal for the knowledge capture and transfer session, ask:

1. What is it about this individual that makes him unique? What piece of the job does he do better than anyone else? What knowledge do you need to capture?
2. Who does this knowledge need to be transferred to?

If the receiver of the knowledge is a novice or advanced beginner, focus on operational and behavioral types of knowledge in the interview. If the person is competent or proficient, focus on cognitive or strategic-level thinking. The conditions surrounding the knowledge transfer session must also be considered. See Table 1 for some conditions where knowledge transfer works best and some conditions that prove challenging for successful knowledge transfer.

Table 1. Considerations for Knowledge Transfer

Conditions Where the Knowledge Transfer Process Works Best	Conditions Where the Knowledge Transfer Process is Challenging
One SME and 1-2 protégés with clearly defined goals allows for targeted knowledge transfer.	More than two protégés with differing goals diverts the focus of the interview from depth to breadth.
Multiple protégés with a specific and clearly defined shared goal allows for a focused, in-depth interview.	When the mentor and protégé work side-by-side on many projects for multiple years, the rate of return is lower.
When there is a clear goal of the knowledge to be transferred and how it will be used once captured.	When there is not a clear goal for the knowledge transfer, the session can wander and lack depth.
When the SME is 1-2 levels above the protégé, it allows for shared patterns and optimal knowledge transfer.	When a SME is more than two levels above the protégé, the gap is often too wide to fill in a short time span.
When SMEs are informed about the goals and benefits and are motivated to try a new process to share their wisdom.	When the SME does not understand the value of participating in a knowledge transfer session or is not motivated to participate.
When a protégé wants to understand how a person thinks, analyzes, or makes decisions. When there is not a clear way to do a task or when there is a need to understand how a process is applied when anomalies exist.	When a protégé wants to understand technical knowledge or when there is a clear way to do a task. This can be shared through less labor intensive means.

2. Capture Key Knowledge

While some key information is typically addressed in succession plans or job handover processes, a large portion of the tacit knowledge in organizations is often missed (see Table 2).

Table 2. What Knowledge is Transferred

Typically Addressed by Succession Plans	Typically Addressed by Job Handover Processes	Typically Not Addressed
• Technical Knowledge • Skills • Role Knowledge (processes, procedures, and standards)	• Role Knowledge (processes, procedures, and standards) • Work Plans • Key Interfaces	• Critical Thinking, Judgment, and Insight • Decision-Making and Cues • Strategic Thinking, Influencing, and Rationale • Underlying Principles • Prior Experience

Experts have a difficult time unpacking what they know and will often just say it is intuitive or so easy that anyone could do it. One method that has been proven to overcome this hurdle is Cognitive Task Analysis—a family of methods designed to capture how an individual thinks and processes knowledge by mapping real-lived experiences (Klein, 1998). Cognitive Task Analysis identifies how experts effectively approach difficult or challenging situations, evaluate and select the best among multiple possible courses of action, think strategically, recognize in advance and avoid potential problems in execution, gain alignment and/or resolve potential conflicts, effectively influence key stakeholders and up-line decision makers, and make split-second decisions in times of urgency.

In the interviews we conducted, we had an expert, the people the knowledge needed to be transferred to, and a knowledge transfer coach in the room. The knowledge coach can be a consultant or simply someone from a different part of the organization, as long as they don't have a deep knowledge of the area or the people involved. In our sessions, we used both with success. The reason for this is to provide a fresh view to people who have been working side-by-side for years, but still haven't pinpointed exactly what makes the one person excel. When someone is fresh to a situation, they will often ask questions the protégé thinks they know the answers to; however, they will often be surprised that the SME's answers are different than they were expecting. In one interview where the expert had 40 years of experience and the protégé had 30 years of experience, he noted, "I have worked side-by-side with this guy for six years, and I learned things I never knew about why he did things the way he did. They were just not questions I thought to ask."

For the interviews we conducted, we used a streamlined version of the Critical Decision Method (Crandall, Klein, & Hoffman, 2006) and elicited stories based on our defined goal by asking the following questions:

Base question:
Can you think of a time when you were (type of incident) and your skills were really challenged?

Detailed questions:
- What made this decision/assessment/situation difficult?
- Why did you choose the path you did?
- What one piece of missing information do you wish you would have had?
- What other options did you consider? Why did you not choose those options?
- What would you do differently if you were in this same situation again?

For the stories, the SME focused on a situation where a dilemma was involved, specifically an incident that had many shades of gray and no clear cut right or wrong answer. In each of the stories, we adapted the questions to ensure we captured key decisions, cues, factors, strategies, challenges, and novice errors. As the SME spoke, the protégé listened, and the knowledge coach mapped the answers on a flip chart that all participants could see. The visual cue allowed for the SME to make clarifications or corrections as needed.

3. Analysis and Documentation

While documentation is important, participants found that the real value came from the conversation itself and being able to hear and ask questions about why experts made the decisions they did. Most of our protégés said they always asked about what happened, and about how the expert did something, but they often missed understanding why the experts chose the path they did. Thus, while transcripts or videos of the interviews seem like they would be the best path to transfer knowledge, none of the protégés used them because the transcripts could run into hundreds of pages and the videos into hours. To combat this overwhelming amount of information, a short summary cognitive checklist format was developed. For each scenario discussed, the knowledge coach wrote a short summary of the incident in the format of a story, and then filled in the table below with bullet points that illustrated specific examples. The documentation became a map or cue card to remind the protégé of the most critical parts of the conversation.

Table 3. Summary Table of Knowledge Transfer Session

Goals	• What was the expert trying to accomplish in this situation.
Challenges	• The reasons the decision is challenging (including barriers).
Cues & Factors	• Cues – Pieces of information from the environment that are used to make the decision (for example, what a person is seeing, hearing, smelling, or feeling). • Factors – Pieces of information known prior to the event that are used to make the decision (for example, history of a situation or cultural differences).
Novice Errors	• The errors inexperienced people tend to make when addressing the decision.
Strategies	• How skilled individuals make the decision (for example, weigh certain cues and factors more heavily than others).

These key lessons learned were then developed into a concept map (a sample of the format is shown in Figure 3) that focused on understanding *how to think* instead of *what to do*. A concept map is simply a graphic representation of key pieces of knowledge visually mapped to show linkages among components. A separate concept map was created for the key people in the SME's network to understand linkages with other individuals and specific roles in the organization. This gave the protégé a reference document for future, similar challenges.

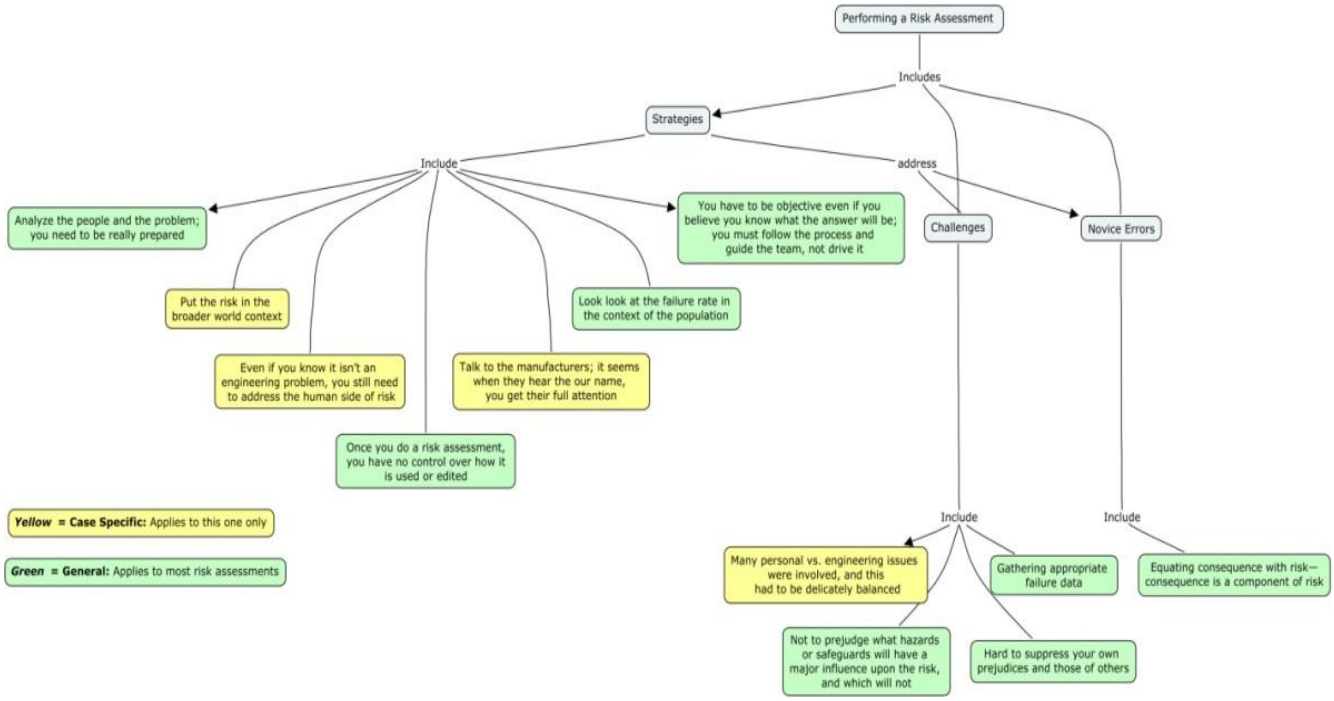

Figure 3. Sample Concept Map

4. Review and Adjust

The knowledge coach's textual write-ups were always done the same day as the interview and then sent to the SME and protégé for review, so the information was still fresh in both minds. At that point, the SME and protégé made necessary corrections and added any new information that came to mind as he or she reviewed the summary. Feedback was also gathered from the protégés, which was crafted into a final edited version. After consensus, the knowledge coach developed the concept map, which was also reviewed and finalized.

5. Design and Develop Training Approach

While steps 1 through 4 help capture the knowledge, a method for effectively transferring the knowledge is also needed. Depending on the SME's level of expertise and who the knowledge was being transferred to, the knowledge captured was transferred using a variety of methods. For mid-level interviews, the knowledge was more procedural or task based, and it was incorporated into on-boarding programs or skills-based formal training. For the more advanced protégés, where the skills being transferred involved strategic thinking or decision-making, methods used included individual study, group meetings, case studies, vignettes, informal learning through online communities of practice (CoP), and social media. The summaries and videos were posted on company intranets and in social learning communities, allowing protégés to access them at any time to further their understanding. Additionally, the tables were transitioned into thinking checklists and job aids in many areas and used both for formal training and informal self-study. The scenarios that emerged were used to trigger conversations both in groups and online on these unique topics.

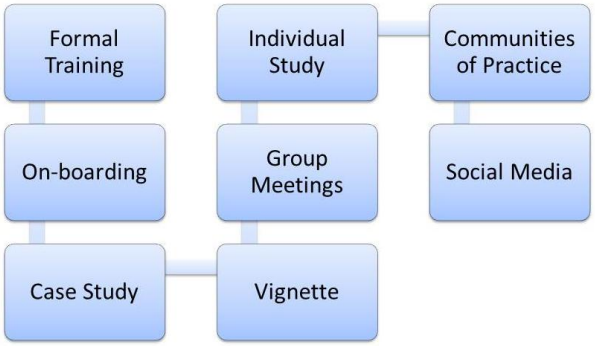

Figure 4. Knowledge Transfer Methods

6. Deliberate Practice to Enhance Knowledge Transfer

The biggest lesson organizations learned was the need for continuous practice. A single, one-time session was helpful but even more effective if continued afterward in quick, recurrent sessions. In the original knowledge transfer session, the protégés felt they engaged in surface learning where they gained a basic understanding of the area and approaches. Additional sessions resulted in a higher level of conceptualization and in adaptive learning where the protégés felt able to apply the knowledge learned to novel situations (Figure 5).

One sample technique used to advance this adaptive learning is called "5-Minute Fridays." On Friday morning, a supervisor would share a scenario gathered from the SME, including the background and current situation, but they stopped short of telling the participants what the SME did. They ended the meeting and let people ponder the situation in the morning. At lunch, everyone was brought back together and some people started to share what they would have done, while others shared the pros or cons of the approach they took. At the end of lunch, everyone found out what the SME actually did and why. This method is a simple technique that puts students in the moment and gives surrogate experience, which enhances knowledge transfer. Another technique was taking the story and creating vignettes with dilemmas that less experienced employees had to decide how to solve, including determining what was required, who would they speak with, and potential second- and third-order consequences.

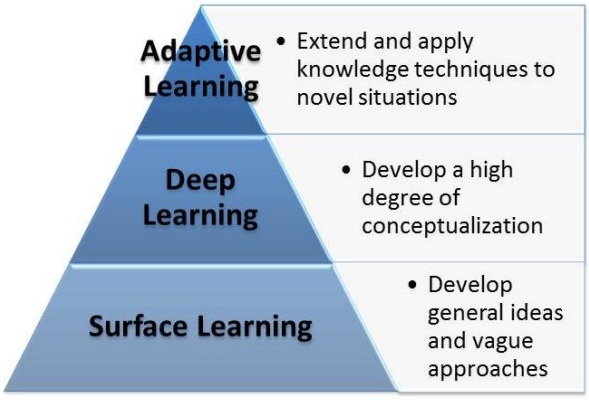

Figure 5. Levels of Learning

RESULTS

Based on this study, we found nine areas where advanced experts set themselves apart from other personnel with the same number of years of experience. While the first thought would be that they have a higher level of technical skill, this was not usually the case. What set these key experts apart was the ability to use and integrate their skills throughout their organization. The areas that made them stand out were in leadership and management skills—prioritization of tasks and customers, project planning (knowing what has been done before and applying lessons learned, understanding and managing risk, and defining a vision and strategy), project management (setting the right tone and keeping the project moving), fostering communication (with team, management, vendors, customers), building and maintaining credibility, understanding cultural differences, marketing what they do and being persuasive, judging opportunities, delegating, and mentoring. How these are applied will vary from organization to organization, yet targeting these areas in structured interviews will give you the ability to better understand tacit knowledge at the top levels of the organization.

Table 4. Nine Areas Where Experts Excel

Nine Areas Where Experts Excel
• Planning • Project Management • Fostering Communication • Building & Maintaining Credibility • Understanding Cultural Differences • Persuasion • Judging Opportunities • Delegating • Mentoring

CONCLUSION

Taking the time to capture expertise is important, but learning the right way to transfer it is even more critical. In this study, the average knowledge capture of a key individual took 24 man-hours from interview to summary document. The knowledge captured the skills that made them experts, but also helped protégés understand how the SMEs thought through challenging situations, why they made the decisions they did, and how they applied different strategies.

Asking the questions described in this paper and applying this process to any organization can create a competitive advantage by enhancing the transfer from key senior professionals and managers to successors and others in the organization, increasing competencies and critical thinking skills broadly across the organization, expediting the development in short service employees, and improving job transitions.

The payoff of taking the time to capture and transfer this high-level specialized knowledge is also reflected in the self-report of the mentors and protégés. SMEs have reported learning more about themselves by thinking and talking about their experiences in different ways. It is rare at the levels they work to ever have the time to reflect on why they made the decisions they did. The protégés have had stronger responses noting that while they usually have taken the time to understand what was done, the organizations rarely document how or why decisions were made. According to the protégés, taking the time to better understand how experts think and attack challenges has saved them time, money, and accelerated their expertise development cycle.

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