TANGIBLE AND INTANGIBLE PROJECT MANAGEMENT PRACTICES: THE POT OF GOLD AT THE END OF THE RAINBOW

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EXECUTIVE SUMMARY

Introduction

This Executive Summary presents a synopsis of a study we completed in 2005. The study was on project management as a source of competitive advantage and involved an online survey of Project Management Institute® members. This paper focuses on practical implications. Readers with questions or suggestions on either this paper or my research program are welcome to contact me at kamj@athabascau.ca.

Thank you to all the participants who supported academic research by participating in this study.

Readers interested in my academic profile can find further details at the following websites:

http://www.mba.athabascau.ca/Titan/aucimwebsite.nsf/AllDoc/D1D78E63D9AF46F487256B7B00700E35?OpenDocument.

http://klaatu-dev.pc.athabascau.ca:8080/dspace/handle/2149/163 This website provides links to some of my publications.

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Background to the Study

In business terms, *winning* is about making more money than the competition. The challenge is to maintain this elusive position. In this paper, we examine the pot of gold at the end of the rainbow, where the "gold" is project management "know-what" (explicit, concrete, and codified knowledge) and "know-how" (tacit knowledge).

From a strategy perspective, a company with an improved competitive position is more profitable than its rivals. Companies strive to compete by developing their assets (or resources); assets can be grouped as financial, human, technological, intellectual, physical, and social. An even simpler distinction is to think of assets as either tangible or intangible in nature.

These days, many companies are turning to project management to complete projects more efficiently and effectively. Some in project management claim that when companies improve codified and documented project management practices (tangible assets, or codified knowledge, such as know-what), project management can be a source of competitive advantage. Researchers in Strategy and Knowledge Management claim that sources of competitive advantage are rooted in knowledge-based assets (intangible assets, or tacit knowledge, such as know-how). The truth may lie somewhere in the middle.

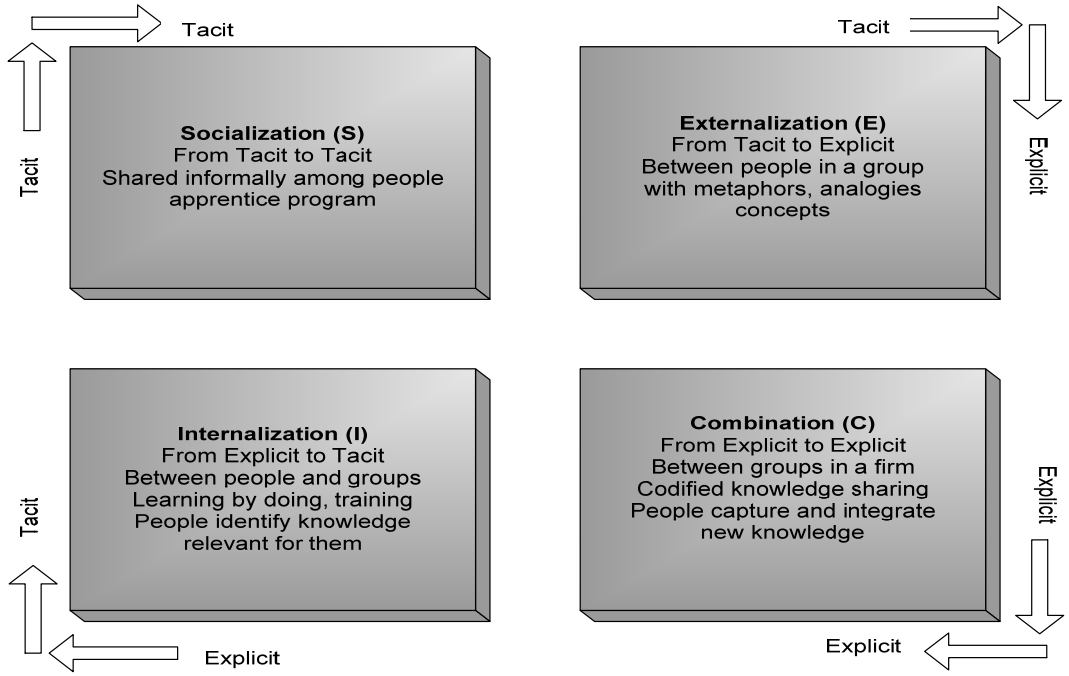
We used the Resource Based View, a theory from Strategy, for our study. Within the Resource Based View framework (Barney, 2002), a company's assets can be assessed to see how ***V****aluable*, ***R****are*, and ***I****nimitable*, they are, as well as the degree of ***O****rganizational Support* (VRIO) they receive within the company. Not all assets are a source of sustained competitive advantage: some assets lead to a competitive disadvantage, others lead to competitive parity, and still others lead to a temporary competitive advantage. To remain competitive, companies focus on and further invest in their strategic assets. Many strategic assets are knowledge-based.

Knowledge Sharing

A useful way of looking at knowledge is with the iceberg analogy. The tip of the iceberg represents the explicit or visible body of knowledge, such as the knowledge developed and shared through tangible project management practices (e.g., project management methodologies, bodies of knowledge, and offices, as assessed with project management maturity models). Explicit knowledge is formal, codified, documented, and concrete in nature. Explicit knowledge is the *know-what* that a company has. However, the larger component of the knowledge iceberg is below the surface. Tacit knowledge, or *know-how*, is personal and experiential. Tacit knowledge is shared informally with others, generally in a face-to-face way.

Knowledge can be changed in four ways within the knowledge-sharing spiral (Nonaka, 1994).

Figure 1: Knowledge Sharing Spiral (adapted from Nonaka)



Socialization (tacit to tacit) involves knowledge sharing through shared experiences in the same physical space. ***Combination*** (explicit to explicit) involves information-processing, databases, and codified knowledge. ***Internalization*** (explicit to tacit) is a form of knowledge conversion that involves learning by doing. ***Externalization*** (tacit to explicit) involves people expressing ideas and images through visual or through figurative language (metaphors, analogies, or narratives).

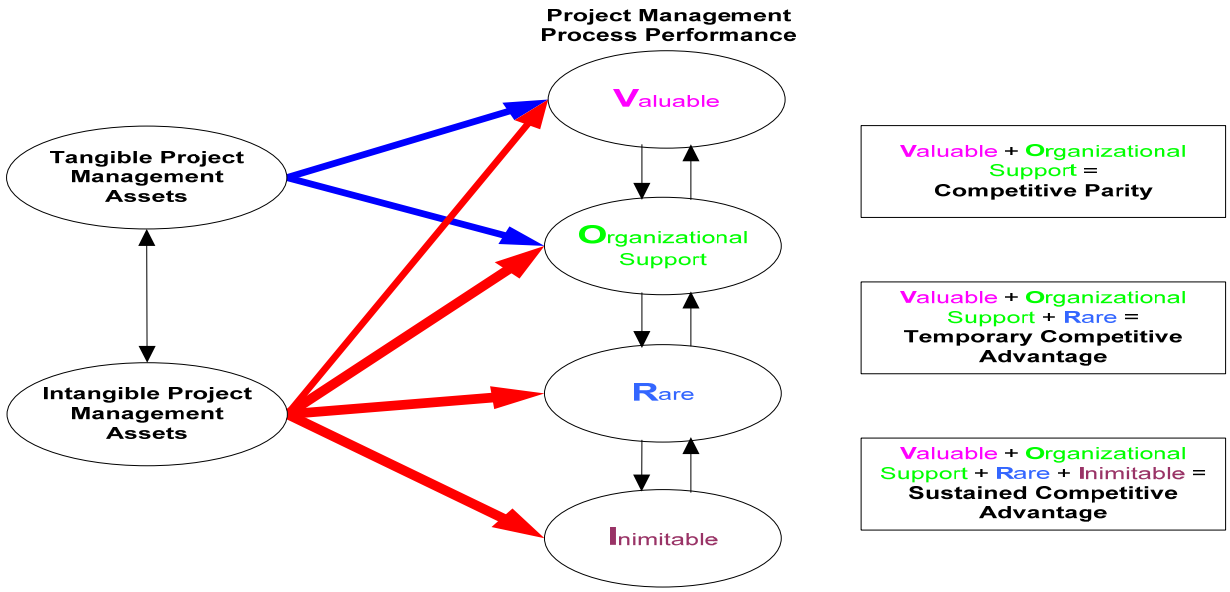
Study Design

How does project management measure up when assessed with the Resource Based View? Many companies have invested in tangible project management practices. Some claim that an investment in improving project management maturity leads to a competitive advantage. Many of these practices emphasize codified knowledge assets. What is the pot of gold in project management? In the ever-competitive marketplace, can the pot of gold be found in codified project management practices? We do not think so. We believe that the key to the pot of gold can be found in the intangible assets of project management.

The research question for our study was "*What is the relationship between the tangible and intangible assets in project management, and how do they influence project management's VRIO profile?*" Our *dependent variable* (the effect we think is influenced by the independent variables) is the performance of the project management process according to the VRIO criteria; and the

two *independent variables* (causes that we think influence the dependent variable) are tangible and intangible assets.

Figure 2: Conceptual Model: Tangible and Intangible Assets and the Project Management Process



According to the Resource Based View, a company achieves *competitive parity* when its resources (assets) are *Valuable*. For a company to achieve a *temporary competitive advantage*, it needs to have resources that are both *Valuable* and *Rare.* Beyond this, a company needs to have certain resources that are *Valuable*, *Rare*, and *Inimitable* in order to have a *sustained competitive advantage.* A company can achieve degrees of competitive advantage. A company has a *competitive disadvantage* when its resources are not *Valuable*, *Rare*, *Inimitable*, and they do not have *Organizational Support.* In the VRIO model, as a company moves from competitive parity, to a temporary competitive advantage, to a sustained competitive advantage, the model shows more and more evidence of *Organizational Support* for these resources. We proposed in our study that a) an investment in tangible project management assets leads to competitive parity (as per the combination of blue arrows), and that b) an investment in intangible project management assets leads to a sustained competitive advantage as per the combination of red arrows.

Project management has not been widely examined using the Resource Based View. Phase one of this research program (2003) involved interviewing 67 project managers to assess project management as a source of competitive advantage at four international companies. We used those findings to help develop questions for this study. Following a pilot study, we conducted an online survey in 2005 by inviting 2,000 randomly selected North American Project Management Institute® members to participate. We achieved a 10.1% response rate as 202 participants completed the survey.

This is an important study for several reasons. First, many people are interested in understanding how project management can be a source of competitive advantage. Second, we have yet to

understand the relationships between the tangible and intangible assets of project management. Third, the Project Management Institute® is interested in understanding the "value" of project management, and our study contributes to this topic. Finally, this study helps heighten awareness of the importance of intangible assets in project management.

Demographics

Brief demographics on the 202 participants follow:

- About 60% of the participants were from the United States and about 40% from Canada.
- The male-to-female participant ratio was nearly 2:1
- Two-thirds of the participants were 30-49 years of age.
- Nearly three-quarters of the participants had their PMP® designation.
- Participants were well educated: over 90% have at least an undergraduate degree.
- Most participants were in middle management positions or technical roles.
- About one-third of the participants had between 6-9 years of experience, and about another third had 10-19 years of experience. About two-thirds of the participants had been with their current company for less than 9 years.
- 61% of the participants were in the top four industries: information industry (23.0%); scientific and technical services industry (16.4%); finance and insurance industry (12.0%); manufacturing industry (9.8%).

Factor Analysis Findings and Practical Recommendations

Factor analysis is a statistical technique that groups variables into a smaller number of components that are easier to analyze. The technique helped us reduce the 80+ questions in the survey into a meaningful number of *factors* (grouped variables).

Factor analysis helped us identify, in order of priority, four tangible project management factors and two intangible project management factors relating to our independent variables (tangible and intangible assets):

1. ***Project Management Maturity*** (tangible factor) reflected the use of project management practices such as a project management office, tools and techniques, methodology, standards, and processes. This factor also addressed the use of program and portfolio management practices, and the efficiency and effectiveness of practices.
2. ***Sharing Know-How*** (intangible factor) included the different ways in which tacit knowledge was shared (e.g., sharing knowledge informally, mentoring, stories, brainstorming, and shadowing).
3. ***Training and Development*** (tangible factor) involved developing project manager competences, support for PMP® certification, and a career path for project managers. This factor included managerial support for training and development.

4. ***Sharing Know-What*** (tangible factor) reflected the use of databases, systems, intranets, best practices databases, and processes for sharing knowledge. This factor included codified knowledge-sharing practices.
5. ***Resistance to Sharing Knowledge*** (tangible factor) corresponded to the lack of knowledge sharing in general within the company. Knowledge sharing took place only within the team or department, and knowledge was not shared due to time constraints.
6. ***Resistance to Sharing Know-How*** (intangible factor) referred to an undervaluing of the practices. Know-how was not shared or supported widely by the firms. Know-how was not shared because this type of knowledge was perceived as a source of power. In addition, participants stated that their companies did not value learning.

The project management maturity factor emerged as the primary factor; it addresses codified practices. The second most important factor was sharing know-how. We view this to be an important factor because we believe intangible assets contribute to a source of project management's competitive advantage.

Using the Resource-Based View, we identified three factors comprising the dependent variable, the performance of project management (as measured by VRIO). These factors are *Valuable, Rare,* and *Organizational Support*. We did not find support for the fourth factor *Inimitable* in this study (primarily because of our smaller sample size).

1. The ***Valuable*** factor involved survey questions (items) on project management providing economic value (e.g., improving business performance, increasing profitability, and responding to environmental threats and opportunities).
2. The ***Rare*** factor involved survey items that showed project management to be unique, controlled by a few firms, and difficult to copy.
3. The ***Organizational Support*** factor involved survey questions on management support, adequate resourcing for the discipline, and project management as an organization-wide undertaking.

Our factor analysis findings indicate that, over and above the codified practices that some claim to be sources of competitive advantage, companies should examine project management from a broader perspective and consider intangible assets as well. Knowledge sharing also emerged as a strong factor in terms of both codified practices and tacit knowledge. We note that training and development was another factor that is important to improved project management practices. We also discovered that there was resistance to sharing project management knowledge (since knowledge is power) and, in particular, that there was a resistance to sharing tacit knowledge. The results of the factor analysis allowed us to conduct structural equation modeling.

Structural Equation Modeling and Practical Recommendations

Structural equation modeling is called multivariate analysis because it involves multiple independent and dependent variables. This technique helped us assess five propositions by

evaluating the strength of the relationships between the six independent variable factors and three dependent variable factors.

> **Proposition 1**: Tangible project management assets are positively correlated to the project management process and provide a firm with competitive parity as assessed by the practices (assets) being *Valuable (V)* with *Organizational Support (O).*

Our study findings did not fully support **Proposition 1**. We did not find evidence to show that tangible project management assets (*Project Management Maturity* and *Sharing Know-What*) positively correlated to the project management process and provided a firm with competitive parity as assessed by the practices being *Valuable* and having evidence of *Organizational Support.* Although we did not find positive relationships between *Sharing Know-What* and *Valuable*, nor between *Sharing Know-What* and *Organizational Support*, we did find that as companies demonstrate a higher level of project management maturity, there was increasing organizational support (policies, procedures, adequate project resources) for the discipline. This supports our premise that it takes more than tangible project management assets to enable the project management process to reflect improved performance. This also supports our position that project management know-what is useful knowledge, but it is not sufficient to help companies have a competitive advantage in the discipline.

> **Proposition 2**: Tangible project management assets are positively correlated to the project management process in providing a firm with a temporary competitive advantage as assessed by the practices (assets) being *Valuable (V)* and *Rare (R)* with *Organizational Support (O).*

Since neither *Project Management Maturity* nor *Sharing Know-What* consistently exhibited positive predictions to *Valuable*, *Rare*, and having *Organizational Support*, we did not find evidence to support **Proposition 2**. We conclude that tangible project management assets do not provide a firm with a temporary competitive advantage through the project management process. This finding was expected because we did not find support for Proposition 1.

Based on propositions 1 and 2, we recommend that companies be cautious if they think that they can achieve a competitive advantage through an investment in just tangible project management practices as per the claims from those promoting project management maturity models. We recommend that companies continue to invest in their tangible project management assets yet also appreciate the importance of the intangible assets.

> **Proposition 3**: Intangible project management assets are positively correlated to the project management process and provide a firm with competitive parity as assessed by the practices (assets) being *Valuable (V)* with *Organizational Support (O).*

Since our results showed positive coefficients between *Sharing Know-How* and *Valuable,* and between *Sharing Know-How* and *Organizational Support*, we conclude that intangible project management assets do provide a firm with a competitive parity and Proposition 3 was supported.

> **Proposition 4**: Intangible project management assets are positively correlated to the project management process in providing a firm with a temporary competitive advantage as assessed by the practices (assets) being *Valuable (V)* and *Rare (R)* with *Organizational Support (O).*

Proposition 4 was supported by our analysis. The coefficients between *Sharing Know-How* and *Valuable*, *Sharing Know-How* and *Organizational Support*, and *Sharing Know-How* and *Rare* were positive. We conclude that intangible project management assets do provide a firm with a temporary competitive advantage through the project management process.

Based on propositions 3 and 4, we recommend that companies focus on intangible project management practices in conjunction with their emphasis on tangible assets. Companies should heighten their awareness of the importance of intangible project management assets, determine how they can foster the use of tacit knowledge sharing throughout the organization, and support such practices. We provide some examples of how to do so in the next section on the knowledge-sharing spiral.

> **Proposition 5**: Intangible project management assets are positively correlated to the project management process in providing a firm with a sustained competitive advantage as assessed by the practices (assets) being *Valuable (V), Rare (R),* and *Inimitable (I),* with *Organizational Support (O).*

In this study, we were not able to assess **Proposition 5** because the concept of *Inimitable* did not emerge in our path model. We know that few companies would have a sustained competitive advantage through project management, and we had a relatively small sample size. Furthermore, we were not able to assess the relationships between *Valuable*, *Rare*, *Inimitable*, and *Organizational Support* due to the sample size.

Knowledge Sharing Spiral Findings and Practical Recommendations

Although the structural equation modeling findings showed that sharing know-how in project management contributed to a temporary competitive advantage in project management, the correlations between the four modes of knowledge sharing did not consistently show strong relationships for us to support the view that project management as a whole was a source of temporary or sustained competitive advantage. As readers will note from Figure 1, efforts on Socialization in particular, help develop sharing know-how. We recommend that companies focus on all four modes of knowledge exchange in project management. Some examples of how to do so follow:

- Key examples of ***Socialization*** (tacit to tacit) knowledge conversion include informal discussions over coffee or lunch, or those discussions at the water cooler. Job shadowing could also be an example of socialization, as well as a project management orientation for a group of new employees.

- Key examples of ***Combination*** (explicit to explicit) knowledge conversion include documents, methodologies, tools, and templates. This category also includes the project management bodies of knowledge as well as assessment tools such as maturity models.
- Examples of ***Internalization*** (explicit to tacit) knowledge conversion include ways in which people reflect on what they are doing and learning, for example through lessons learned whereby they can internalize specific knowledge for personal development.
- Examples of ***Externalization*** (tacit to explicit) knowledge conversion are harder to think of and may be more prevalent in project management environments that heavily emphasize idea generation, concept designs, and new product development.

Based on the study findings, we suggest that companies first assess their practices in terms of the knowledge-sharing spiral. We suggest that companies use the following reflective questions to determine their knowledge-sharing practices in terms of the four categories — socialization, externalization, combination, and internalization.

- What project management practices can be identified to fit each of the four categories?
    - Responses to this question will help participants identify what practices fit into each category and enable participants to clarify their understanding of the framework.
- How extensively are the four knowledge-sharing processes used in the project management context?
    - Answers to this question will help organizations determine the breadth of use of the knowledge-sharing processes.
- Which of the four knowledge-sharing processes are weak at the company? Which of the four knowledge-sharing processes reflect strengths at the company?
    - Responses to these questions will help organizations determine how good the firm's knowledge-sharing processes are.
- Which knowledge-sharing practices do members of the organization deem to be most important to develop and why?

- Answers to this question will help the organization determine which category or categories they want to focus on as areas for improvement. Answers should also relate to the gaps that were identified in terms of knowledge-sharing processes.

Next, as organizations reflect on their knowledge-sharing processes, they could reflect on and assess their current investments in project management training and development as well as their receptiveness to sharing various forms of knowledge. They will be in a better position to assess their receptiveness to sharing various forms of knowledge after completing the knowledge-spiral assessment. Companies should examine organization-specific (unique) ways in which they can develop knowledge-sharing practices and support their use, especially regarding tacit knowledge (know-how).

Companies interested in improving their VRIO profile in project management should:

- Assess their resistance to sharing knowledge and know-how, as this will have implications on their sharing know-what capabilities, as well as on their receptiveness to training and development and their project management maturity levels.
- Invest in training and development specific to project management so that they are better positioned to have consistent and standard codified and documented project management practices and processes (project management maturity).
- Assess their project management maturity (where project management maturity encompasses the breadth of codified knowledge) and ensure that they are investing in the discipline accordingly since our study found that companies with well-developed project management maturity practices value project management in the economic sense, so that the discipline receives more organizational support.
- Assess how well they share both their know-what and know-how in project management. We found that companies with well-developed project management maturity practices and processes were better at sharing know-what (their explicit knowledge of project management among staff). We also found that companies that shared know-what were more likely to share know-how (tacit knowledge). This was important because it had implications for project management being VRIO.

Based on the findings supporting our propositions, we recommend that companies not be misled that an investment in tangible project management assets will provide them with competitive parity. It takes more than tangible project management assets to enable the project management process to improve performance. We recommend that companies constantly assess their investment in both tangible and intangible assets in project management.

We are convinced that tacit knowledge in project management continues to be underappreciated, yet it has the potential to be a source of competitive advantage as evident from the positive relationships between the VRIO elements. We recommend that companies make a concerted effort to develop their intangible assets in project management and invest in them because these are what may contribute to project management as a source of temporary competitive advantage: knowledge-based assets are more likely to be rare than tangible ones.

Study Conclusions and Contributions

This study contributes to the growing bodies of research on the Resource Based View and project management. Specifically, this study bridges the two fields. A strength of the study is that we anchored it using an existing theory (the Resource Based View and from this, the VRIO framework), which we then applied to project management.

We are now well positioned to conduct another empirical study that will help us better understand how tangible and intangible project management assets contribute to the performance of the project management process. We incorporated a summary of the study findings in an application to the Social Sciences and Humanities Research Council (SSHRC) for an academic grant. That funding will allow us to do a large-scale study (2006-2008) on this topic. We are working on a peer reviewed journal paper and conference paper. We are also working on a Natural Sciences and Engineering Research Council (NSERC) proposal to research lessons learned in the petroleum industry. Towards that study, we plan to capitalize on findings from this study.

To summarize, in this study, we conducted an online survey with North American Project Management Institute® members. We examined the inter-relationships between our independent variables (tangible and intangible assets in project management) and our dependent variable (the project management process as assessed with the VRIO criteria). We used both exploratory factor analysis and structural equation modeling to analyze the data. This is an important topic because we have yet to understand the dimensions of project management as a source of competitive advantage. Increasingly, successful projects contribute to improved business results. Our findings support the view that the more valuable pot of gold at the end of the rainbow contains intangible project management practices.

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