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Advancing project and portfolio management research: Applying strategic management theories ☆

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Abstract

This paper focuses on the application of strategic management theories to Project Management and Project Portfolio Management research, specifically the Resource-Based View, Dynamic Capabilities, and Absorptive Capacity. A literature review and four research experiences illustrate the advances achieved through the use of these three theoretical perspectives, and contribute to the development of this field by providing examples and guidance for theory development and future research. Commonalities between the research examples include a strong strategic focus, recognition of the importance of knowledge and learning, and research questions seeking understanding and explanation. These research experiences outline the successful application of strategic management theories to a wide range of contexts, using diverse methodologies at a variety of levels of analysis. The findings indicate a broad potential for further fruitful research stemming from the relatively recent application of strategic management theories to Project Management and Project Portfolio Management research.

Keywords: Project portfolio management; Project success and strategy; Project management research; Strategic management theory; Resource-based view; Dynamic capabilities; Absorptive capacity

1. Introduction

Project Management (PM) research and Project Portfolio Management (PPM) research advance through the use of theories from the strategic management domain and, in turn, the research contributes to the development and strengthening of these theories by providing empirical examples for testing and validation. This paper focuses on a set of theoretical strategic perspectives — the Resource-Based View (RBV), the Dynamic Capability (DC) concept, and the Absorptive Capacity (AC) concept — and their application to PM and PPM research. Through an overview of these strategic management perspectives and their application to PM and PPM research, this paper aims to contribute to the development of this research field by highlighting the challenges and lessons learned, and by providing examples and guidance for future research.

One of the goals of strategy research is to determine why some organizations are more successful than others, and to understand the mechanisms that help some organizations achieve and sustain a competitive advantage (Grant, 2010; Rumelt et al., 1994). Competitive advantage is the ability of an organization to create more value than its rivals, and therefore achieve superior return on investment (Barney and Hesterley, 2006). Sustained competitive advantage requires capabilities that provide enduring benefits and are not easily copied by competitors or rendered obsolete (Barney and Clark, 2007; Kwak and Anbari, 2009). In fast-

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changing environments, capabilities that enable organizations to adapt rapidly and repeatedly can lead to strategic advantages (Eisenhardt, 1989; Teece et al., 1997). Established PM and PPM capabilities that have been developed over time and customized to an organization's environment are not easy to copy. These established capabilities are repeatedly associated with better outcomes (see for example Alvarez and Busenitz, 2001; Cooper et al., 2001; Jugdev et al., 2007; Killen et al., 2008), prompting PM and PPM to be viewed as strategic organizational capabilities that have the ability to provide competitive advantage.

The linkages between strategy, PM, and PPM are well established and have been explored in the literature for more than two decades (see for example Artto and Dietrich, 2004; Artto et al., 2008; Cooper et al., 1999; Meskendahl, 2010; Morris, 1994; Morris and Hough, 1987; Prencipe and Tell, 2001; Shenhar et al., 2001; Söderlund, 2004). This literature is represented in publications from a wide range of disciplines, including strategic management, innovation management, and project management. Although this paper does not intend to provide a comprehensive review of the literature linking projects and strategy, a few examples are offered to illustrate some themes. A bi-directional relationship between strategy, projects, and PPM is proposed in the literature on the enactment of strategy through projects and the ability of project and portfolio activities to inform strategy development (for example Artto et al., 2004; Morris and Jamieson, 2005; Poskela et al., 2005). The particular strategic management challenges associated with the evolving role of PM in organizations are generating rich avenues of investigation, such as studies on the emergence of project-based organizations and the types of capabilities required in these 'P-form' organizations (DeFillippi and Arthur, 1998; Keegan and Turner, 2002; Söderlund and Tell, 2009; Whitley, 2006), and related studies into the management of complex product systems (Davies and Brady, 2000; Hobday, 2000). This paper contributes to this rich and active field of literature linking strategy and projects by focusing on an under-explored theme: the application of established strategic management theories to PM and PPM research.

While much has been written about the linkages between strategy and projects, the application of theories from the strategic management domain to PM and PPM research is a relatively new endeavor. Historically, PM has been viewed as an operational rather than a strategic asset (Jugdev and Thomas, 2002) and success has been measured in operational terms such as budget and time metrics. More recently, researchers and practitioners have begun to promote the measurement of the strategic impact of project outcomes (Dinsmore and Cooke-Davies, 2006; Jugdev and Thomas, 2002). As the PM community has strengthened its focus on the strategic aspects of PM, it has also placed a higher level of importance on PPM and its relationship with strategy. A review of PM-related publications in management journals over the past 50 years reveals that PPM and strategy topics represent the highest proportion, and shows a steady upward trend that is expected to continue (Kwak and Anbari, 2009). Pinto (2007, p. 101) summarizes the links between PM, PPM, and strategy by noting that "profitability often runs through the area of strategic PM. One of the most effective methods for aligning profit objectives and strategic plans is the development of a proactive project portfolio".

PM and PPM are relatively young disciplines, and the research approaches and standards are in transition. Advances in PM and PPM research have resulted in studies with increased methodological rigor, such as those that develop and test conceptual models through sophisticated statistical analysis and others that employ qualitative multiple-case studies involving in-depth interviewing, observation, and analysis (Turner, 2010). However, most PM and PPM research remain largely atheoretical and this highlights an opportunity to further advance PM and PPM research by drawing upon established theories. As PM and PPM maturities have evolved, so has their relevance to the realization of organizational strategy. Therefore, some PM and PPM researchers have turned to theories and frameworks from the strategic management domain, finding the application of these theories both rewarding and challenging. Since the application of strategic management perspectives to PM and PPM is relatively new, the lessons learned from these initial studies are especially illustrative. By consolidating and analyzing some of this research, this paper aims to provide guidance for future research and to contribute to the continued advance of PM and PPM research.

Section 2 overviews the literature on three theories from the domain of strategic management: the RBV, DC, and AC. Four research experiences are then outlined in Section 3 to illustrate the application of these three theoretical perspectives to PM or PPM research. Section 4 discusses and analyses the research experiences and Section 5 offers conclusions and suggestions for future research.

2. Literature review

2.1. Resource-based view

Stemming from Penrose's classic work on how firms grow (Penrose, 1959), the RBV examines how an organization's resources drive competitive advantage. The RBV assumes that resources and capabilities are not uniform across competing organizations, and uses this heterogeneity to explain differences in organizational success rates.

According to the RBV, resources that are valuable, rare, inimitable, and non-substitutable (VRIN) or valuable, rare, inimitable, and involve organizational focus and support (VRIO), form the best basis for sustainable competitive advantage by being difficult for other organizations to copy or acquire (Barney, 1991, 2001; Priem and Butler, 2001; Wernerfelt, 1984). However, only a handful of a company's assets are strategic assets that contribute to its competitive advantage (Amit and Schoemaker, 1993; Kraaijenbrink et al., 2010). Examples of strategic resources include intellectual property rights, reputation, brand, and culture (Eisenhardt and Santos, 2002; Kaplan et al., 2001; Kogut, 2000; Nonaka, 1994). Such strategic assets involve explicit and tacit knowledge that is embedded in a company's unique skills, knowledge, resources, and ways of working (Rumelt et al., 1994). These intangible resources are more likely to serve as sources for competitive advantage than

tangible resources (Brush et al., 2001; Eisenhardt and Martin, 2000; Ray et al., 2004), as knowledge-based resources are embedded in a company's unique skills, knowledge, and ways of working (Foss, 1997; Molloy et al., 2011).

The RBV has gathered momentum over the past three decades and continues to hold merit as an influential, popular, and fruitful area of strategy research (Kraaijenbrink et al., 2010; Verona, 1999). The related VRIN and VRIO frameworks are widely used in empirical studies on strategic assets (Barney et al., 2011; Kraaijenbrink et al., 2010; Newbert, 2007; Ray et al., 2004). As the RBV has matured and become a well-established theory, some authors prefer the label RBT (Resource-based Theory) and a special issue of the Journal of Management was recently devoted to its future (Barney et al., 2011).

The research on strategy and competitive advantage from the perspective of the RBV has evolved to advance the understanding of how organizations develop and sustain competitive advantage, and how a combination of resources and knowledge processes are arranged and adjusted. However, some authors criticize the theory and question its practical applicability to organizational research, identifying definitional challenges and pointing out that the path-dependent and evolutionary nature of the RBV is suited to relatively stable environments and may require both internal organizational stability and external environmental stability to be applied in practice (Lengnick-Hall and Wolff, 1999; Priem and Butler, 2001). A major extension to the RBV takes steps to address these weaknesses; 'dynamic capabilities' (DC) are identified as a class of organizational capabilities that enable organizations to effectively respond to changes in the dynamic environments in which they compete (Eisenhardt and Martin, 2000; Teece, 2007; Teece et al., 1997).

2.2. Dynamic capabilities

Teece et al. (1997, p. 516) initially defined a DC as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". As the concept has evolved, other authors have used terms such as 'patterned elements' (Winter, 2003), 'routinized activities' (Zollo and Winter, 2002), 'core micro-strategies', or the relatively stable sets of routines that are involved with shaping strategy (Salvato, 2003). Some definitions focus on the relationship between DCs and lower-order capabilities such as operating routines (Winter, 2003). One such definition defines a DC as a "learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of competitive advantage" (Zollo and Winter, 2002, p. 340). Emphasizing the relationship between DC and the resource base, Helfat (2007, p. 4), defines DC as "the capacity of an organization to purposefully create, extend, or modify its resource base".

An alternative view of DC focuses on the "behavioral orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage" (Wang and Ahmed, 2007, p. 35). Similarly, a DC can be viewed of as a particular type of organizational capability that focuses on learning processes and provides organizations with the ability to reconfigure resources and routines to adapt to changing environments (Jarzabkowski and Wilson, 2006). Organizational learning aspects are highlighted in a growing segment of the literature on DC (Antonacopoulou et al., 2005; Cepeda and Vera, 2007; Easterby-Smith and Prieto, 2007; Prieto and Easterby-Smith, 2006).

Although DCs are considered a type of resource-based capability, they are different from the traditional resources described by the RBV. For example, while the VRIN and VRIO frameworks proposed that resource-based competencies must be difficult to copy or imitate to provide lasting competitive advantage, DCs are often easy to copy and acquire (Eisenhardt and Martin, 2000). DCs often show strong commonalities across organizations and industries, and thus allow the identification of 'best practices' that may be transferred or acquired more easily than some resource-based capabilities. DCs cannot add value alone; they do this by reconfiguring the existing resource-base (Eisenhardt and Martin, 2000) and therefore can be considered enabling resources (Smith et al., 1996). In addition, the relative ease by which DCs may be copied or acquired limits their ability to independently provide lasting value. DCs also require the prior establishment of supporting capabilities through a sequential order of implementation (Eisenhardt and Martin, 2000) and play an important role in allocating resources, as well as in identifying the desired development and direction of resources and capabilities in line with strategy (Wang and Ahmed, 2007). Therefore, the presence of both DC, as well as underlying resource advantages that are VRIN or VRIO, is required for long-term competitive advantage in dynamic environments (Teece et al., 1997).

Teece, Pisano, and Shuen's 'processes, positions, and paths' (PPP) framework (Teece et al., 1997) provides a model of the mechanisms at play in the relationship between resources, DCs, learning, and performance. Through the PPP framework, DCs are shown to be organizational routines or processes that are path dependent and rely strongly on the resource position of the organization (the underlying resource base) to generate sustainable competitive advantage. Another DC framework proposed by Teece (2007, 2009) identifies classes of relevant micro-foundations (i.e., distinct skills, processes, procedures, organizational structures, decision rules, and disciplines) and their interrelationships. The framework comprises three main capabilities that are proposed to be required for effective DC:

- To *sense* and shape opportunities and threats;
- To *seize* opportunities; and
- To maintain competitiveness through enhancing, combining, protecting, and when necessary, *reconfiguring* the business enterprise's intangible and tangible assets.

The growing body of research and literature on DC includes criticism that points out the need for more empirical research. This identification of specific organizational processes as DCs is promoted in order to generate empirical research for the continued development and validation of theoretical frameworks

(Eisenhardt and Martin, 2000; Helfat, 2007). The body of empirical research on DC is enhanced by the recent identification of the longer-established 'absorptive capacity' (AC) concept as a crucial DC in knowledge-based competition (Fosfuri and Tribó, 2008; Zahra and George, 2002). Other literature also debates the validity of the DC concept due to definitional problems and tautologies (Priem and Butler, 2001), prompting suggestions of better ways of defining capabilities and resources that allow empirical testing of the theories (Barney, 2001; Eisenhardt and Martin, 2000; Helfat, 2007; Peteraf and Barney, 2003; Zollo and Winter, 2002).

2.3. Absorptive capacity

The increasing importance of external knowledge resources has influenced the rise of AC to become one of the most significant concepts on learning and strategic advantage (Camisón and Forés, 2010). Cohen and Levinthal (1989, 1990) identified AC as a type of capability that enables organizations to innovate and, thus, to be dynamic (Todorova and Durisin, 2007). The need to appreciate and acquire knowledge from the *external* environment is central to the AC concept, often enhanced by internal processes of learning from past experience and current actions (Easterby-Smith et al., 2008). The three main component capabilities of AC are the capabilities to recognize the value of new external knowledge, to assimilate that knowledge internally, and apply it to commercial ends (Cohen and Levinthal, 1989). According to Easterby-Smith et al. (2008), AC is located between the fields of DC (Teece et al., 1997; Zollo and Winter, 2002), organizational learning (Akgun et al., 2003), and knowledge management (Chiva and Alegre, 2005; Oshri et al., 2006). Sun and Anderson, (2010, p. 134) recognized that a "holistic view of [AC] has thus evolved by conceptualizing it as a *dynamic capability* which cannot be disentangled from the systems, processes and structures of the organization". The concept of AC shows enough flexibility to be applied in a variety of research fields such as industrial organization, organizational learning, strategic management, innovation management (Zahra and George, 2002), and PM (Bakker et al., 2011). Some authors assert that the definition of AC and its antecedents can be ambiguous, and point to a number of studies that do not validate the construct (Lane et al., 2006; Van den Bosch et al., 2003). Camisón and Forés (2010, p. 707) acknowledge that "the intangible nature of the construct represents a hurdle to its conceptualization" and highlight the importance of accurate definitions, clear scope, and reliable and valid measurements when applying the AC concept.

2.4. Overview of literature applying the three strategic management theories to project management or project portfolio management research

A growing body of literature views an organization's PM or PPM capability as an asset or resource through the RBV, DC, and AC perspectives. Following the RBV logic, intangible PM resources are more likely to be rare and inimitable, and thus more likely to be sources of competitive advantage than tangible resources. Some examples of intangible PM resources include the application and sharing of tacit knowledge, and processes and relationships for facilitating this sharing. The RBV was initially applied to PM research as outlined in the first research experience presented below (see for example Jugdev, 2004b; Jugdev et al., 2007). An emerging stream of literature follows this lead (see for example Barratt and Oke, 2007; DeFillippi and Arthur, 1998; Ethiraj et al., 2005; Jugdev and Mathur, 2006; Mathur et al., 2007; Paiva et al., 2008; Peng et al., 2007). These authors used a mix of qualitative and quantitative empirical approaches to study PM through the VRIO lens and often designated the PM process outcomes as the dependent variable using survey questions focused on, for example, time, cost, scope, quality, and customer satisfaction. The findings emphasize the merits of intangible resources congruent with the strategic management literature on the VRIO framework. The application of DC to PM research appears limited to a study by Verona and Ravasi (2003), where DC theory highlighted the importance of knowledge-based resources in a project-based innovation context. PPM research has only just begun to apply strategic management theory via the DC concept; early examples are provided in the second and third research experiences below (see for example Killen et al., 2007b, 2008; Petit and Hobbs, 2010, 2011). Other studies following this theme include Bresnen (2009), Newey and Zahra (2009), and Zahra et al. (2006).

Interestingly, although the AC concept has been in existence for 20 years, relatively limited research has been done on the notion of AC in a project context. Other than the fourth research example outlined below, only two studies were identified that applied AC to PM. One study compared 12 cases of knowledge transfer between temporary inter-organizational projects and permanent parent organizations (Bakker et al., 2011). A high level of AC of the project owner was found to be a necessary condition for successful project knowledge transfer, and successful project knowledge transfer was shown to be a complex process involving configurations of multiple factors in which successful project managers needed to cope with complexity by paying attention to both relational and organizational processes. The other study investigated how organizations manage the early phases of R&D projects in the pharmaceutical industry and found that optimizing combinative capabilities (i.e., adaptive, absorptive, innovative, project, and multi-project capabilities) can provide powerful leverage and boost frequent innovation (Biedenbach, 2011).

In summary, this literature review overviews the RBV, DC, and AC theories from the strategic management domain that focus on competitive advantage. These theories are developing and evolving with accrued experience and an accumulating body of empirical research. Initial research has been cited that indicates that the RBV and the DC and AC theories can provide valuable insights to strengthen research studies in PM and PPM, and that they add to the strategic management literature by providing examples of specific organizational capabilities from the RBV, DC, and AC perspectives.

3. Research experiences

Four research experiences are presented in this section to provide examples of the application of strategic management theories to PM and PPM research. Each of the examples presents a study at the PM or PPM level of analysis, applying one of the three theoretical perspectives that are the focus of this paper: the RBV, DC, or AC.

3.1. Project management as a strategic asset through the resource-based view

This example outlines a program of research studies that focus on the characteristics of PM as a strategic resource, the process of developing and sustaining PM as a source of competitive advantage, the differences between tangible and intangible PM resources, and the application of a RBV framework to classify PM resources in terms of complexity and leverage. This research program was anchored in the RBV to address the challenges presented by the research questions. The RBV offered a well-developed conceptual and empirical base from which to draw; such a theoretical base was not evident in the project management literature. The studies involved questions that moved beyond the "what" and asked "how" and "why", and were best investigated through exploratory interviews and case studies, followed by surveys (Yin, 2009).

The first mixed-methods study (2000–2003) asked whether PM is a strategic asset, and included four case studies from different industries (67 interviews) and 28 responses to a PM maturity survey (Jugdev, 2003, 2004a). At best, these organizations developed PM as a strategic enabler but not as a source of competitive advantage (Jugdev, 2004b, 2005a,b,c, 2008). The research found that it takes more than a superior reputation or a high PM maturity level for a competitive advantage through PM. Tangible PM resources (PM methodologies) and intangible resources (such as culture-embracing PM, social networking, and knowledge sharing) were identified. Organizational support practices, such as leadership, continuous improvement, and relating PM to strategic goals, were found to contribute to strategic advantage. Elements of inimitability through the use of periods of stable PM practices contributed to PM as a source of competitive advantage, as did the organization's history (path dependence) in terms of its PM practices.

In the second study (2004–2007), an enhanced survey instrument using the VRIO framework was completed by 202 Project Management Institute® (PMI®) members (Jugdev, 2007; Jugdev and Mathur, 2006). The exploratory factor analysis yielded three key tangible resource factors (PM maturity, training and development, and sharing know-what), and one intangible resource factor (sharing know-how) that influenced the three factors identified as PM process variables (Valuable, Rare, and Organizational Support characteristics — but not 'Inimitable' — from the VRIO framework). The structural equation model examined the relationships between these independent and dependent variables. Whereas tangible resources (PM maturity and sharing know-what) predicted PM as valuable and organizational (competitive parity), intangible PM resources (sharing know-how) resulted in the PM process being both valuable and rare (that is, a temporary advantage). Tangible resources, while valuable, did not directly result in the PM process being rare and were therefore not a source of competitive advantage. However, when mediated by intangible PM resources, tangible PM resources resulted in the process being both valuable and rare, albeit a temporary advantage. Challenges were encountered in identifying unobservable constructs through item responses. In particular, this study was not able to identify a factor for 'Inimitable', indicating a need to refine the items.

The third and most recent study (2008–2012), employed a refined set of items for the 'Inimitable' construct, addressing one of the challenges in the earlier study. One hundred and ninety-eight North American PM Institute® members responded to the refined survey. The exploratory factor analyses identified resource groupings that were labeled as: valuable PM/IT resources (structured knowledge, unstructured knowledge, IT resources); rare knowledge-sharing PM resources (processes, tools); and inimitable PM resources (codified knowledge practices, uncodified knowledge practices) (Jugdev and Mathur, 2011). This study followed the approach that Ray et al. (2004) used in explaining why they used an intermediate dependent variable to test the RBV empirically.

In doing so, this study further elucidated the PM process (as the primary and intermediate dependent variable) and organization level performance (as the aggregate dependent variable). Lessons learned from these research studies highlight the fact that research is messy and never perfect. These insights gained from the RBV literature and its application to PM may assist other researchers:

- Qualitative approaches are useful when applying the RBV to new areas of study, such as PM, as well as for instrument refinement purposes, because interviews help elucidate concepts by enabling researchers to gather "rich data" and insights on how participants interpret concepts. Qualitative approaches are also helpful in exploring problematic RBV concepts, such as intangible resources (Kraaijenbrink et al., 2010; Molloy et al., 2011).
- A sustainable competitive advantage through PM is better assessed by asking participants to compare their own company to others in the field than by asking them to rank or rate their own company's competitive advantage. It is helpful to augment this with other related questions, such as PM maturity indicators.
- It is important to address conceptual and measurement aspects, especially as they pertain to intangible resources (Molloy et al., 2011). It is more appropriate to use an intermediate dependent variable (such as the PM process) than it is to use an aggregate variable (such as organization performance), because too many confounding factors influence organizational performance (Ray et al., 2004).

The PM research using the RBV lens reported here contributes to the growing body of empirical work on strategic resources and to the literature on PM. The findings contribute

to understandings on PM as a source of competitive advantage and identify the breadth of intangible PM resources and their importance. This stream of research contributes to theory development by explicating the challenges of operationalizing the 'Inimitable' component of the VRIO framework. The study further contributes to RBV research methods by refining the instruments. In doing so the researchers modified some survey items and developed new ones. Throughout, they based the items on RBV and PM terms as conceptualized in the literature.

As the PM researcher community using the RBV continues to evolve, existing empirical studies can be drawn upon to extend the work into other areas of PM that involve intangible resources. For example, PM communities of practice enable teams to share individual and group PM knowledge and learning (intangible knowledge-based resources) in a number of ways, such as explicit, structured, or documented lessons learned. Future research is planned to employ situated learning theory, an approach that is anchored in workplace learning to explore these questions (Fenwick, 2008; Wenger, 1998). Whereas the scope of this research program focused on PM as a source of competitive advantage, the concepts and some of the constructs developed could be adapted and modified for consideration in a PPM context. Future research could also use the instruments developed in this research program in other industry contexts. In addition, future studies could relate intangible knowledge-based assets in the context of agile product development teams, to understand how such collaborative, self-directed teams employ knowledge-based resources to gain competitive advantage.

3.2. Project portfolio management as a dynamic capability using the 'processes, positions and paths' framework

PPM was identified as a DC in a mixed-method two-phase PhD study (Killen, 2008) on the relationship between an organization's PPM capability and its ability to establish sustained competitive advantage through new product and service offerings. At the time, the atheoretical nature of the PPM literature did not provide a theoretical base for exploring the relationship between PPM capabilities and competitive advantage. The lack of accepted theories to draw upon for the research presented a challenge for the PhD study, and therefore one of the research questions explored whether strategic management theory could be applied to assist in this understanding. Theories from the strategic management domain were selected, due to the strong strategic importance of PPM highlighted in the literature and as revealed during the first phase of the study. The RBV and DC perspectives were identified as potentially valuable for the investigation. Extant PPM research did not draw upon these theories; however, some early work by Jugdev (2004b, 2007) justified the use of the RBV for PM research and was used to help justify the application of the DC to explore PPM capability.

The findings of the study supported the use of the DC perspective. The PPP framework developed by Teece et al. (1997) helped to illuminate the relationships between the processes used for PPM, the resource position of the organization, and the historical paths and future options available and the development of competitive advantage in a dynamic environment. The findings supported the proposition that DCs co-evolve through a combination of tacit and explicit learning mechanisms, and proposed an enhanced model to show how investments in organizational learning activities are regularly used to enhance these learning mechanisms in a PPM environment (Killen et al., 2008; Zollo and Winter, 2002). Furthermore, the application of the PPP framework helped to justify and explain the ongoing evolution of PPM capabilities as part of the functioning of a DC, as the capability must change and evolve in response to environmental dynamism in order to remain effective (Eisenhardt and Martin, 2000; Teece et al., 1997).

The research employed a quantitative questionnaire-based survey and a qualitative multiple-case study. The study adopted a wide view of PPM capabilities, including both PPM processes and organizational factors. Phase 1 survey findings highlighted the strategic importance of PPM capabilities and produced a benchmark of PPM practices and outcomes in Australia based on 60 Australian organizations (representing a 36% survey response rate). Phase 2 comprised a multiple-case study focusing on six successful innovators and used the PPP framework (Teece et al., 1997) to investigate the relationship between PPM capabilities and competitive advantage. In addition to detailed investigations into the actions and processes that contributed to the organizational PPM capability, the case study sought information to identify valuable organizational resources (such as tangible assets, skills, organizational routines and knowledge, and customer base) and the deployment and development of these resources. Furthermore, due to the strong evolutionary component of a DC, the study targeted research participants familiar with the historical developments of PPM within their companies, and some of the semi-structured interview questions were designed to gain information on the past evolutionary paths and future plans for the organizational PPM capability. All data were transcribed and analyzed using the NVivo qualitative data analysis software. The data were coded and interpreted using within-case, cross-case, and embedded-case analyses (Killen et al., 2008).

This study was the first to identify the DC framework as a useful perspective for PPM research (Killen et al., 2007a, 2008). The identification of PPM as a DC is significant for several reasons. Most importantly:

- The application of the DC framework moved the research beyond simple 'best practice' correlation-based relationships and provides an understanding of the mechanisms that enable a PPM capability to lead to competitive advantage.
- The DC theory provides a framework that helps to analyze the existing literature as well as future research on PPM capabilities.
- The study of PPM capabilities is enhanced by a growing body of literature investigating DCs, their establishment and evolution through organizational learning, and their relationship to sustainable competitive advantage. The literature is also strengthened by the addition of PPM capability as an example of a specific organizational capability that acts as a DC.

The DC framework provides an appropriate perspective for developing a deeper understanding of the relationship between PPM capabilities and competitive advantage. Using the DC framework, a PPM capability was viewed as a source of competitive advantage through its ability to build, reconfigure, and allocate resources and to modify operational capabilities to respond to the dynamic environment. A PPM capability was shown to have a two-way relationship with resources, by deploying and developing resources and capabilities, and by exhibiting path dependencies as they develop over time and are modified through experiences and through choices about future options and opportunities. The DC perspective was also useful in understanding how PPM capabilities are established and evolve and contributed to the development of conceptual models.

Several methodological lessons were learned during the application of DC theory to this research. The importance of capability evolution to the study of DC meant that as much longitudinal data as possible needed to be collected. As a longitudinal study was not possible, other approaches needed to be developed. In this study, the ability to collect temporal data was enhanced by the length of experience of the interviewees (average employment at the case organization of 16 years), through extensive questioning about past events and future plans, and through triangulation of the responses from multiple interviewees. Lessons were also learned with respect to defining and categorizing the findings in order to determine the level of alignment with DC theory. There is a tension between being too prescriptive and too flexible in defining and categorizing elements of DC in an organizational environment. Prescriptive and pre-determined definitions and research approaches that look for specific activities have the potential for missing important elements of DC that were not pre-identified. However, definitions that are too loose and explorations that are too flexible will fail to produce data that is rigorous enough to support analysis. The lesson learned is to be mindful of this tension and to tailor the approach to the situation. The approach used in this research, as it was exploratory in nature, leaned toward flexibility to ensure that emergent themes could be captured, while taking steps to ensure that definitional rigor was maintained in order to support analysis and conclusions. To this end, an iterative approach to analysis and identification of themes and activities was employed in the multiple-case study research. Follow up questioning was used with some of the early organizations, and all data were re-analyzed in full with the benefit of learning and identification of emergent themes at the end of the data collection period.

This research demonstrated that the DC framework can enhance understanding of the relationship between PPM capabilities and outcomes; however, it was based on a limited amount of qualitative data and the proposed models have not been tested. There will be challenges to overcome in order to test and validate or refine the models, as a larger-scale study will require the identification of items and scales to measure the variables.

This research experience was exploratory and initiated the use of the DC frameworks for the study of PPM capabilities, opening up a wide range of future research opportunities. Several conceptual models were proposed, drawing upon the DC framework. Future research studies require careful attention to definitions and methodology in order to operationalize these models for testing and validation or adjustment, and must acknowledge and address the criticisms and weaknesses of the theories. Future research could also involve longitudinal studies to capture the dynamism of DC and to develop a detailed understanding of the development of PPM capabilities and the role of investments in learning activities, their influence on the effectiveness of learning mechanisms, and the resulting changes to the PPM capabilities and outcomes.

3.3. Using dynamic capabilities to study project portfolio management in dynamic environments

Building on the previous research example, this research employed the DC framework to answer the research question: *How is uncertainty affecting project portfolios managed in dynamic environments?* The study objectives were:

- To identify the organizing mechanisms used to manage uncertainty affecting project portfolios in dynamic environments;
- To evaluate the use of the DC framework to study project portfolios;
- To study PPM at the operational level using concepts from sense-making (traditionally used to study the interpretative mechanism at the individual level) and from DC (traditionally used to study strategic processes at the corporate level);
- To provide feedback to academics, practitioners, and standard bodies on potentially useful practices in the field of project portfolio management.

This research started from the observation that the PPM literature has focused primarily on project selection, prioritization, and balancing. Although PMI® has introduced the notions of risk management in the recent version of the standard, there is little additional guidance or empirical evidence on how portfolio managers should handle uncertainty and changes affecting their project portfolio. The PMI® Standard for Portfolio Management (PMI, 2008, p. 6) mentions that, in projects, the project manager tries to keep change to a minimum while the "portfolio manager continually monitors changes in the broad environment". This research proposed to study how these changes to the environment and uncertainties are managed at the portfolio level by using concepts from the DC and sense-making literatures (Eisenhardt and Martin, 2000; Teece, 2009; Teece et al., 1997; Weick, 1979, 1995, 2009).

A conceptual framework based on Teece (2007, 2009) was adapted for this research and provided the basis for data collection. The organizing mechanisms that are used to deal with uncertainty were identified and structured according to Teece's sensing, seizing, and reconfiguring framework:

- *Sensing* referred to structures, tools, and processes to sense, filter, and interpret changes and uncertainties.
- *Seizing* included the structures, the tools, and procedures for identifying that changes are required once a change or uncertainly has been sensed.

- *Reconfiguring* was defined as the actions taken to ensure alignment of projects and resources with the changes identified by the sensing mechanisms and decided upon in seizing.

Four portfolios were studied: two in an organization in the software development industry and two in the financial industry. The organizations each had well-established PPM capabilities in existence for more than two years — long enough to have encountered different types of changes and uncertainties. The portfolios were complex and included a large number of dependencies between projects. This provided sufficient material to:

- Understand the management of project portfolios, more specifically the operational activities involved once portfolios are authorized and launched;
- Understand the relationships between the sources of uncertainty in dynamic environments and the organizational mechanisms used to minimize their impact and to capitalize on opportunities;
- Develop ways in which to operationalize the concepts in the DC framework, and suggest improvements to the DC framework.

The experiences from this research showed that the DC framework was well suited to the study of PPM processes in uncertain environments. The study allowed for the observation of the processes according to a different lens than the usual PM processes.

The initial conceptual framework used to collect data was composed of three main concepts: *sensing, seizing, and reconfiguring/transforming* (Teece, 2009). This initial framework was useful to collect data and to structure the interviews but had to be enhanced during data analysis.

In all four portfolios, one of the main challenges was to translate uncertain product requirements into project scopes that could be launched, planned, and monitored. Knowing that the requirements were uncertain and bound to change, organizations put mechanisms in place to increase flexibility, agility, and their ability to react quickly and efficiently by reallocating resources to the right projects and to work on the right project scope.

During the data analysis, it was found that the terms *reconfiguring* and *transforming* had to be clarified and were best used to refer to two different concepts. It became clear that there were at least two orders of changes occurring in the organizations, and that it would be useful to distinguish and treat these two concepts separately. In the context of PPM, the term *reconfiguring* was used to refer to the following first-order activities:

- Changes in the project portfolio structure. This included any changes in the project configuration: new projects, new sub-portfolios, and termination of projects;
- Changes in the allocation of financial and human resource to the project portfolios;
- Operational changes related to a better alignment of the portfolio to the changes in the environment.

Transforming can be conceived as a second-order capability defined as the competence to improve or to build new first-order competences. In the PPM context, the term *transforming* was used to refer to the following second-order activities:

- Modifying the *sensing–seizing–reconfiguring* mechanisms used in the first-order level of PPM described above (for example, changing the governance structure, modifying the rules used for reconfiguring, adding a new sensing mechanism);
- Introducing new structures, processes, or tools to support the PPM activities which might not directly result in changes in the first-order sensing–seizing–reconfiguring mechanisms (for example, modifications to the software development process, and new architecture to support a more flexible product structure).

The study was limited to the first two orders of DC and did not include consideration of how portfolios were selected, prioritized, and authorized. In the PPM context, a third level of DC is related to the portfolio selection. Budgets and human resources were allocated to project portfolios at the highest levels in organizations based on vision, mission, and strategies. The choice to invest in one portfolio or another was a strategic decision and dependent on the changes identified in the environment. This is often the level at which DC is discussed. The third order also includes the evaluation of the performance and improvements to the second-order capability. This research studied a number of well-established portfolios for which a budget, a vision, and a mission had been approved. The process leading to the establishment of these portfolios was not formally investigated in detail and future research including such third-order mechanisms might offer additional insights.

To conclude Section 3, the fourth and final research experiences involved an examination of PM research using the AC lens.

3.4. Applying absorptive capacity to project management research

AC emphasizes acquiring external knowledge, assimilating it, and applying it. The final research experience presented in this paper shows how concepts from AC helped to illustrate the mechanisms at play in a major government organizational change project in Quebec aimed at improving student health. The research explored eight schools' capabilities to absorb new knowledge from the government project to innovate health behaviors in schools — hence the term *Healthy Schools Project.* The study investigated the ability of schools to respond to strategic change by constructing capabilities to acquire external knowledge, assimilate it, transform the shared knowledge at a group level to the schools' organizational level, and exploit the newly acquired knowledge into the schools' operations.

Schools are organizational settings that have a significant impact on the health and emotional well-being of children and adolescents. Schools influence students at important stages in their lives. Global, social, cultural, and economic changes are translated by many governments into a continuous stream of reforms aimed at restructuring schools. These external pressures

create numerous challenges for schools as they strive to adapt to meet government requirements and change and improve students' performance. As with any organization, a school's capacity to adapt, change, improve, and respond to new needs depends on its capacity to learn and absorb new knowledge.

The study employed a two-step approach consisting of a conceptual framework and multiple case studies. Inspired by Zahra and George (2002), a conceptual framework was proposed to understand schools' capabilities to absorb an innovation (Deschesnes et al., forthcoming). The conceptual framework was a multidimensional model adapted to a school context based on:

- The four dimensions Zahra and George (2002) used to describe AC (acquisition, assimilation, transformation, and exploitation);
- The two subsets of AC identified by Zahra and George (2002) — potential AC and realized AC;
- Components and mechanisms that induced or intensified organizational efforts to seek external knowledge, such as the AC of its members, the prior organizational knowledge base, and the School Director's leadership (Deschesnes et al., 2010).

Eight schools were selected from regions of Quebec, Canada (three public primary schools, four public secondary schools, and one school with both primary and secondary levels). Qualitative data were analyzed according to the core dimensions of the proposed conceptual framework (Drouin and Deschesnes, 2010). The findings showed that the first part of the equation (potential AC) was more easily achieved than the second part (realized AC). The schools demonstrated capabilities to acquire and assimilate external knowledge from the *Healthy Schools Project.* However, there were very few instances of transformation and exploitation.

Pablo et al. (2007, p. 687) recognized that "Public sector managers are increasingly expected to use managerial strategies to improve organizational performance and implement innovative activities-even in times of decreasing financial resources". The study shed light on the various forms AC can take in the public sector through a study on schools.

The proposed AC conceptual framework helped to qualify and compare each school's level of potential and realized ACs. Schools cannot reach a high level of AC without having both parts of the equation (potential AC and realized AC). In other words, it was necessary for schools to develop not only the ability to acquire new knowledge and to assimilate it, but also to apply it to add benefits or value to school community (Cohen and Levinthal, 1990).

The proposed AC conceptual framework was also helpful to appreciate the mechanisms and processes that seemed to have the greatest influence on the level of absorption of knowledge from the project. These mechanisms played important roles in schools' capacity to absorb new knowledge. In other words, successful project knowledge transfer and its management were complex processes that implied the management of multiple factors. Bakker et al. (2011, p. 502) raised the important issue that "project practitioners (like the school directors) are likely to be successful if they succeed in coping with complexity by simultaneously paying attention to relational and organizational processes".

AC provided an appropriate perspective as the Healthy Schools project implied substantial changes in the way schools approach the topic of health. Schools needed to recognize the value of new knowledge from these changes; they need to identify new knowledge to improve pupils' behavior regarding health. Thus, the AC conceptual framework provided a multidimensional approach that enabled school management to evaluate the concrete integration of the innovation in the whole school setting. It served as a conceptual basis to manage the AC from an innovative project and to design empirical research with the aim of better understanding the process of building school capabilities to become healthy settings for children (Deschesnes et al., forthcoming). The AC conceptual framework also served as a very useful instrument to analyze data and perform cross-case comparisons.

Based on case studies, this research demonstrated the application of AC concepts to projects. Future studies could further validate the AC conceptual framework with additional case studies in diverse school contexts (i.e., other provinces in Canada or other countries) and in contexts others than school environments. Methodological challenges related to the evolving nature of AC could be addressed by using longitudinal methods or by designing processes tailored to capture past experiences. Future research could also concentrate on understanding the mechanisms that facilitate or hinder the transfer of knowledge in innovative projects, examining more deeply the conditions and processes that influence appropriation in innovative projects, or on developing valid and reliable measures to determine the value of AC in innovative projects.

In summary, Section 3 has presented four research experiences based on the RBV, DC, and AC theories from strategic management as applied to PM and PPM. The research experiences highlighted some of the theoretical and methodological challenges and outlined the approaches used to address these challenges. Table 1 provides an overview of the four experiences summarizing the unit of analysis, the theory applied, the research challenges, main findings, lessons learned, and the suggested areas for future research stemming from each research experience.

4. Discussion

This paper summarizes the literature and outlines four research experiences on the application of the RBV, DC, and AC strategic management theories and their related frameworks to research on PM and PPM. In the search for existing theories to support the investigations, each of these studies was guided by research questions that led the researchers to the field of strategic management. Each of the theories outlined in this paper, the RBV, DC, and AC, provides a unique perspective and set of frameworks and models to support research investigations. The four research experiences provide examples of the application of these frameworks and models in PM and PPM settings.

Table 1
Summary of the four research experiences.

Research experience	Unit of analysis	Challenges	Main findings	Lessons learned	Future research
1. PM as a strategic asset through the RBV	PM	Previous research did not consider PM resources as a source of competitive advantage. The application of the RBV provided this perspective.	The RBV is appropriate to identify and categorize PM resources. Intangible PM resources directly contribute to competitive advantage through PM. Tangible resources do not.	Developed approaches for wording unobservable constructs such as *Inimitable*. Mixed methods studies can be applied to research on PM and competitive advantage with rewarding results.	Examine intangible PM resources and categorizations. Apply situated learning theory (communities of practice) to intangible PM resources. Relate intangible assets in the context of agile development.
2. PPM as a DC using the PPP framework	PPM	Lack of extant literature and research methods that use a theoretical base for PPM research limit depth of understanding.	DC theory aligns with the learning and change observed and outlines mechanisms through which PPM can contribute to competitive advantage.	Tracking capability initiation and evolution, learning and change are beneficial for the study of PPM as a DC. Elements of the capability must be defined in terms of DC frameworks to facilitate analysis.	Proposed conceptual models on learning and PPM drawing upon DC theory should be tested. Longitudinal studies could be used to study PPM evolution in further detail.
3. Using DC to study PPM in dynamic environments	PPM	To translate the theoretical concepts of dynamic capabilities into a framework used to collect and analyze data.	Terminology such as *reconfiguring* and *transforming* were ill-defined in the literature DC could be decomposed into multiple orders.	DC framework is well suited to study PPM processes in uncertain environments. Challenges in classifying organizing mechanisms into sensing, seizing, reconfiguring/ transforming and in expressing/ translating DC for interviewees.	Investigate the multiple orders of DC in PPM: resource re-allocation, process improvements, and portfolio selection.
4. Applying AC to PM research	PM	To show how concepts from AC helped to illustrate the mechanisms at play in organizational change.	*Potential AC* (the ability to acquire and assimilate new knowledge) was more easily achieved than *realized AC* (the ability to transform and exploit this new knowledge).	AC conceptual framework helped to qualify and compare the level of potential and realized ACs and to appreciate the mechanisms and processes with the greatest influence on the level of absorption.	Validate the AC conceptual framework in other contexts and in using longitudinal methods to capture the evolving nature of ACs. Develop measures to value AC in innovative projects.

The research experiences, although diverse, reveal several common themes such as a strong strategic perspective and a desire for explanation and deep understanding of organizational phenomena related to PM and PPM. In particular, the research experiences reported in this paper view PM and PPM as strategic capabilities which have a role to play in the competitive advantage of the organization. Through application of the RBV, DC, and AC, the research experiences identify specific examples of concepts, constructs, and related measures specific to these theories, and highlight the importance of the organizational context to the investigations. In addition to the strong strategic emphasis, the research experiences that draw upon the DC and AC theories emphasize the importance of knowledge, learning, environmental dynamism, the ability to leverage resources or capabilities, and the path dependent nature of PM and PPM.

While there are common themes, the four research experiences illustrate a diverse range of applications of strategic management theories to PM and PPM research. The examples span small and large organizations in the private and public sectors. The levels of analysis range from PM and project implementation, to PPM at both strategic and operative levels. The application of the RBV, DC, and AC to these studies has provided benefits such as methodological rigor and increased explanatory power. This successful application of these strategic management theories to such a diverse set of circumstances indicates that these theories may have wide potential to support further research in PM and PPM.

In addition to making conceptual and empirical connections between specific strategy theories, PM, and PPM, the research experiences suggest implications for future research. From a methodology perspective, the four research experiences exhibit a breadth of research methods ranging from qualitative interviews and case studies to quantitative approaches involving survey instruments from the strategic management, PM, and PPM domains. In the process of the research, existing strategic frameworks and methodologies were modified, extended, or adapted to suit the research in each of the PM and PPM environments. For example, the first research experience sought to understand whether PM is a strategic capability or asset, and if so to identify why and how PM acts as a strategic asset through a study of the factors that form and that influence the PM capability. The study drew upon earlier item scales and studies involving the RBV and VRIO frameworks and then refined the scales and frameworks, thus contributing to the advance of research in this area. This first research experience illustrated a valuable application of the RBV to PM research, addressing concerns about the practical applicability of the RBV raised by Priem and Butler (2001).

The second research experience looked to strategic management theory to explain the relationship between PPM and

competitive advantage and applied the PPP framework from the DC perspective (Teece et al., 1997) to structure the analysis. The components of the PPP framework were interpreted in terms of a PPM capability, providing a practical example of the application of this framework.

The third research experience built upon this theme and applied Teece's (2007, 2009) sensing, seizing, and reconfiguring/transforming framework to portfolios in dynamic environments. This research proposed clarifications to facilitate the application of the framework. Two orders of DC were recognized, and the terms 'reconfiguring' and 'transforming' were clarified and defined as applying to first- and second-order DCs, respectively. This experience highlighted the importance of definitional analysis and clarification for such research.

Finally, the fourth research experience drew upon Zahra and George's (2002) model of AC as a foundation to identify and structure the key factors that influence the capacity of a school to absorb or incorporate new knowledge and practices. It considered categories of components aligned with those proposed by Zahra and George, along with additional dimensions identified as relevant to the project and school context through the literature and initial investigations. These four research experiences provide a valuable resource to guide future research by illustrating the practical application of theoretical perspectives to research in PM and PPM contexts, highlighting challenges and outlining methodological approaches and adjustments.

These are early days for PM and PPM research and the community of researchers in this area continues to evolve (Turner, 2010). The research experiences presented here reflect common theoretical and methodological challenges. The key to dealing with such challenges rests in 'standing on the shoulders of giants' by capitalizing on the insights from publications that analyze, apply, and critique the theoretical, conceptual, and methodological aspects of the RBV, DC, and AC.

The research experiences cited in this paper provide some insight into whether and how the different levels of emphasis on strategy affect the application of strategic management theories to research. While PM and PPM are increasingly seen as strategic capabilities that have the potential to lead to competitive advantage, PPM is generally viewed as a more strategic-level capability than PM, and part of its strategic role is to enable the organization to respond and adapt to changing environmental conditions by monitoring and altering the project portfolio. PM, in contrast, is seen as a strategic asset from a more static perspective — as a capability to perform projects effectively. The RBV, as a more static theory, is shown to be effective when applied to PM research in the first research example cited in this paper. The three research examples that apply the DC and AC theories have a stronger focus on learning and change. In particular, the research examples suggest that the DC perspective is well aligned with PPM research in environments of dynamism and change. The initial application of the AC perspective to PM research shows promise for helping researchers understand internal organizational capabilities that affect project success.

Taken as a whole, the research experiences in this paper may serve to stimulate further examination of the ways in which strategic theories contribute to PM and PPM research. Future studies could evaluate whether there is alignment between the organizational level of analysis (PM, PPM, or other) and the most appropriate strategic management theory (RBV, DC, AC, or other). Studies that aim to clarify the limitations of each theory with respect to PM and PPM research would provide valuable guidance to advance this field. As this stream of research evolves, future research could track whether and how the findings from the application of strategic management theory to PM and PMM research contribute to the broader development of the RBV, DC, AC, or other strategic management theories.

5. Conclusion

The literature review and research experiences reported in this paper highlight the advantages as well as the challenges of adopting theories from strategic management for PM and PPM research. This paper makes four primary contributions to the PM, PPM, and strategic management fields.

First, the literature review and the research experiences illustrate how PM and PPM research is strengthened by the explanatory power and solid theoretical foundations provided by the use of three theories from the strategic management domain — the RBV, DC, and AC. The research is strengthened by drawing upon the extensive conceptual and empirical studies and the large volume of literature associated with these well-established theories. In addition to enriching PM and PPM research, the use of these theories integrates the research with research in other disciplines that draw upon these theories. Second, this paper shows how strategic management theories provide well-studied and debated frameworks and methodologies that can be adopted or adapted for use in a PM or PPM context. As outlined in the research experiences and the literature review, these frameworks and methodologies provide an established base that can be built upon and adjusted to suit the particular environment. Third, examples of the practical application of the RBV, DC, and AC to PM and PPM research are provided to return benefits to the field of strategic management. This empirical research helps to develop, validate, or extend the RBV, DC, and AC theories. The compilation of research experiences in this paper also provides a valuable resource to guide future research by highlighting challenges and outlining methodological approaches and adjustments. Finally, wide-ranging future research opportunities are suggested by this paper. Each of the research experiences outlines related future research avenues. In addition, this paper's illustration of a diverse set of PM and PPM research experiences supported by the RBV, DC, and AC theories suggests that a wide range of PM and PPM investigations may benefit from the application of strategic management theory. As these avenues for research evolve, future research is likely to illustrate rich and rewarding developments in this area.

In conclusion, these contributions highlight the benefits that can be obtained by the application of strategic management theories such as the RBV, DC, and AC to PM and PPM research. By adopting, adapting, building upon, and contributing to established theories from the strategic management domain, PM and

PPM research domains demonstrate their positions as focused subsets among management and strategic management research rather than as separate domains. This positioning stands to further advance PM research and PPM research by integrating these domains with the more theoretically advanced fields within strategic management and providing a broader range of options for research collaboration and dissemination. Monitoring and learning from this research avenue as it unfolds has the potential to continue to advance PM and PPM research through further refinement and sophistication in the application of strategic management theories.

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References

Akgun, A.E., Lynn, G.S., Byrne, J.C., 2003. Organizational learning: a socio-cognitive framework. Human Relations 56, 839–868.

Alvarez, S.A., Busenitz, L.W., 2001. The entrepreneurship of resource-based theory. Journal of Management 27, 755–775.

Amit, R., Schoemaker, P.J.H., 1993. Strategic assets and organizational rent. Strategic Management Journal 14, 33–46.

Antonacopoulou, E., Ferdinand, J., Graca, M., Easterby-Smith, M., 2005. Dynamic capabilities and organizational learning: socio-political tensions in organizational renewal. Advanced Institute of Management Research AIM Working Paper Series: 014-January-2005.

Artto, K.A., Dietrich, P.H., 2004. Strategic business management through multiple projects. In: Morris, P.W.G., Pinto, J.K. (Eds.), Wiley Guide to Managing Projects. John Wiley and Sons, Hoboken (NJ), pp. 144–176.

Artto, K.A., Dietrich, P.H., Nurminen, M.I., 2004. Strategy implementation by projects. In: Slevin, D.P., Cleland, D.I., Pinto, J.K. (Eds.), Innovations: Project Management Research. Project Management Institute, Newtown Square (PA), pp. 103–122.

Artto, K.A., Martinsuo, M., Dietrich, P., Kujala, J., 2008. Project strategy: strategy types and their contents in innovation projects. International Journal of Managing Projects in Business 1, 49–70.

Bakker, R.M., Cambré, B., Korlaar, L., Raab, J., 2011. Managing the project learning paradox: a set-theoretic approach toward project knowledge transfer. International Journal of Project Management 29, 494–503.

Barney, J.B., 1991. Firm resources and sustained competitive advantage. Journal of Management 17, 99–120.

Barney, J.B., 2001. Is the resource-based "view" a useful perspective for strategic management research? Yes. Academy of Management Review 26, 41–56.

Barney, J.B., Clark, D.N., 2007. Resource-Based Theory: Creating and Sustaining Competitive Advantage. Oxford University Press, Oxford, New York.

Barney, J.B., Hesterley, W., 2006. Organizational economics: understanding the relations between organizations and economics analysis. In: Clegg, S., Hardy, C., Nord, W.R. (Eds.), Handbook of Organization Studies. Sage, London, pp. 111–148.

Barney, J., Ketchen, D.J., Wright, M., 2011. The future of resource-based theory: revitalization or decline? Journal of Management 37, 1299–1315.

Barratt, M., Oke, A., 2007. Antecedents of supply chain visibility in retail supply chains: a resource-based theory perspective. Journal of Operations Management 25, 1217–1233.

Biedenbach, T., 2011. The power of combinative capabilities: facilitating the outcome of frequent innovation in pharmaceutical R&D projects. Project Management Journal 42, 63–80.

Bresnen, M., 2009. Project Organisation, Dynamic Capabilities and Learning Mechanisms in Construction EURAM, Liverpool, UK.

Brush, C.G., Greene, P.G., Hart, M.M., Haller, H.S., 2001. From initial idea to unique advantage: the entrepreneurial challenge of constructing a resource base. The Academy of Management Executive 15, 64–78.

Camisón, C., Forés, B., 2010. Knowledge absorptive capacity: new insights for its conceptualization and measurement. Journal of Business Research 63, 707–715.

Cepeda, G., Vera, D., 2007. Dynamic capabilities and operational capabilities: a knowledge management perspective. Journal of Business Research 60, 426–437.

Chiva, R., Alegre, J., 2005. Organizational learning and organizational knowledge: towards the integration of two approaches. Management Learning 36, 49–68.

Cohen, W.M., Levinthal, D.A., 1989. Innovation and learning: the two faces of R&D. The Economic Journal 99, 569–596.

Cohen, W.M., Levinthal, D.A., 1990. Absorptive capacity: a new perspective on learning and innovation. Administrative Science Quarterly 35, 128–152.

Cooper, R.G., Edgett, S.J., Kleinschmidt, E.J., 1999. New product portfolio management: practices and performance. Journal of Product Innovation Management 16, 333–351.

Cooper, R.G., Edgett, S.J., Kleinschmidt, E.J., 2001. Portfolio Management for New Products, Second Edition. Perseus, Cambridge (MA).

Davies, A., Brady, T., 2000. Organisational capabilities and learning in complex product systems: towards repeatable solutions. Research Policy 29, 931–953.

DeFillippi, R.J., Arthur, M.B., 1998. Paradox in project-based enterprise: the case of film making. California Management Review 40, 125–139.

Deschesnes. M., Drouin, N., Couturier, Y., forthcoming. Schools' absorptive capacity to innovate in health promotion. Journal of Health Organization and Management.

Deschesnes, M., Trudeau, F., Kebe, M., 2010. Factors influencing the adoption of a health promoting school approach in the Province of Quebec, Canada. Health Education Research 25, 438–450.

Dinsmore, P.C., Cooke-Davies, T.J., 2006. Right Projects Done Right! From Business Strategy to Successful Project Implementation. Jossey-Bass, San Francisco.

Drouin, N., Deschesnes, M., 2010. Schools' capabilities to absorb innovation in health promotion, strategic management society. 30th International Annual Conference, Rome, Italy.

Easterby-Smith, M., Graça, M., Antonacopoulou, E., Ferdinand, J., 2008. Absorptive capacity: a process perspective. Management Learning 39, 483–501.

Easterby-Smith, M., Prieto, I.M., 2007. Dynamic capabilities and knowledge management: an integrative role for learning? British Journal of Management 19, 235–249.

Eisenhardt, K.M., 1989. Making fast strategic decisions in high-velocity environment. Academy of Management Journal 32, 543–576.

Eisenhardt, K.M., Martin, J.A., 2000. Dynamic capabilities: what are they? Strategic Management Journal 21, 1105–1121.

Eisenhardt, K.M., Santos, F.M., 2002. Knowledge-based view: a new theory of strategy? In: Pettigrew, A.M., Thomas, H., Whittington, R. (Eds.), Handbook of Strategy and Management. Sage Publications, London, pp. 139–164.

Ethiraj, S.K., Kale, P., Krishnan, M.S., Singh, J.V., 2005. Where do capabilities come from and how do they matter? A study in the software services industry. Strategic Management Journal 26, 25–45.

Fenwick, T., 2008. Understanding relations of individual-collective learning in work: a review of research. Management Learning 39, 227–243.
Fosfuri, A., Tribó, J.A., 2008. Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. Omega 36, 173–187.
Foss, N.J., 1997. Resources, Firms, and Strategies: A Reader in the Resource-Based Perspective, 1st ed. Oxford University Press, Oxford (UK).
Grant, R.M., 2010. Contemporary Strategy Analysis: Concepts, Techniques, Applications, 7th ed. Wiley, Chichester, West Sussex, UK.
Helfat, C.E., 2007. Dynamic Capabilities: Understanding Strategic Change in Organizations. Blackwell Publishing, Malden (MA).
Hobday, M., 2000. The project-based organisation: an ideal form for managing complex products and systems? Research Policy 29, 871–893.
Jarzabkowski, P., Wilson, D.C., 2006. Actionable strategy knowledge: a practice perspective. European Management Journal 24, 348–367.
Jugdev, K., 2003. Developing and Sustaining Project Management as a Strategic Asset: A Multiple Case Study Using the Resource-Based View. University of Calgary, Canada, p. 498.
Jugdev, K., 2004b. Project management as a strategic asset: what does it look like and how do companies get there? PMI Research Conference 2004, London, UK.
Jugdev, K., 2004a. Through the looking glass: examining theory development in project management with the resource-based view lens. Project Management Journal 35, 15–26.
Jugdev, K., 2005a. Project management as a strategic asset: what does it look like and how do companies get there?, In: Slevin, D.P., Cleland, D.I., Pinto, J.K. (Eds.), Innovations: Project Management Research 2004, 1 ed. Project Management Institute, Newtown Square, PA, pp. 161–174.
Jugdev, K., 2005b. Project management as a strategic asset: an empirical investigation of the relationships between tangible and intangible assets. Project Management and the Project Management Process as a Source of Competitive Advantage, Western Academy of Management. Western Academy of Management, Las Vegas (NV).
Jugdev, K., 2005c. The VRIO framework of competitive advantage: preliminary research implications for innovation management. Portland International Centre for Management of Engineering and Technology Conference: A Unifying Discipline for Melting the Boundaries. PICMET, Portland (OR).
Jugdev, K., 2007. Closing the circle: the knowledge management spiral of project management. International Journal of Knowledge Management Studies 1, 423–441.
Jugdev, K., 2008. Good theory: developing a foundation for project management. International Journal of Product Development 6, 177–189.
Jugdev, K., Mathur, G., 2006. Project management elements as strategic assets: preliminary findings. Management Research News 29, 604–617.
Jugdev, K., Mathur, G., 2011. Project management assets and project management performance: preliminary findings. Portland International Centre for Management of Engineering and Technology Conference: Technology Management in the Energy-Smart World. PICMET, Portland (OR).
Jugdev, K., Thomas, J., 2002. Project management maturity models: the silver bullets of competitive advantage? Project Management Journal 33, 4–14.
Jugdev, K., Mathur, G., Fung, T.S., 2007. Project management assets and their relationship with the project management capability of the firm. International Journal of Project Management 25, 560–568.
Kaplan, S., Schenkel, A., von Krogh, G., Weber, C., 2001. Knowledge-based theories of the firm in strategic management: a review and extension. MIT Sloan Working Paper 4216-01.
Keegan, A.E., Turner, J.R., 2002. The management of innovation in project-based firms. Long Range Planning 35, 367–388.
Killen, C.P., 2008. Project Portfolio Management for Product Innovation in Service and Manufacturing Industries. Macquarie University, Sydney (Australia), p. 464.
Killen, C.P., Hunt, R.A., Kleinschmidt, E.J., 2007a. Dynamic Capabilities: Innovation Project Portfolio Management. Australia and New Zealand Academy of Management (ANZAM), Sydney (Australia).
Killen, C.P., Hunt, R.A., Kleinschmidt, E.J., 2007b. Managing the New Product Development Project Portfolio: A Review of the Literature and Empirical Evidence. Portland International Center for Management of Engineering and Technology (PICMET), Portland (OR), pp. 1864–1874.
Killen, C.P., Hunt, R.A., Kleinschmidt, E.J., 2008. Learning investments and organizational capabilities: case studies on the development of project portfolio management capabilities. International Journal of Managing Projects in Business 1, 334–351.
Kogut, B., 2000. The network as knowledge: generative rules and the emergence of structure. Strategic Management Journal 21, 405–425.
Kraaijenbrink, J., Spender, J.-C., Groen, A.J., 2010. The resource-based view: a review and assessment of its critiques. Journal of Management 36, 349–372.
Kwak, Y.H., Anbari, F.T., 2009. Analyzing project management research: perspectives from top management journals. International Journal of Project Management 27, 435–446.
Lane, P.J., Koka, B.R., Pathak, S., 2006. The reification of absorptive capacity: a critical review and rejuvenation of the construct. Academy of Management Review 31, 833–863.
Lengnick-Hall, C.A., Wolff, J.A., 1999. Similarities and contradictions in the core logic of three strategy research streams. Strategic Management Journal 20, 1109–1132.
Mathur, G., Jugdev, K., Fung, T., 2007. Intangible project management assets as determinants of competitive advantage. Management Research News 30, 460–475.
Meskendahl, S., 2010. The influence of business strategy on project portfolio management and its success — a conceptual framework. International Journal of Project Management 28, 805–817.
Molloy, J.C., Chadwick, C., Ployhart, R.E., Golden, S.J., 2011. Making intangibles "tangible" in tests of resource-based theory: a multidisciplinary construct validation approach. Journal of Management 37, 1496–1518.
Morris, P.W.G., 1994. The Management of Projects. Thomas Telford Services Ltd., London.
Morris, P.W.G., Hough, G.H., 1987. The Anatomy of Major Projects: A Study of the Reality of Project Management. John Wiley & Sons, Chichester (UK).
Morris, P.W.G., Jamieson, A., 2005. Moving from corporate strategy to project strategy. Project Management Journal 36, 5–18.
Newbert, S.L., 2007. Empirical research on the resource-based view of the firm: an assessment and suggestions for future research. Strategic Management Journal 28, 121–146.
Newey, L.R., Zahra, S.A., 2009. The evolving rirm: how dynamic and operating capabilities interact to enable entrepreneurship. British Journal of Management 20, S81–S100.
Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. Organization Science 5, 14–37.
Oshri, I., Pan, S.L., Newell, S., 2006. Managing trade-offs and tensions between knowledge management initiatives and expertise development practices. Management Learning 37, 63–82.
Pablo, A.L., Reay, T., Dewald, J.R., Casebeer, A.L., 2007. Identifying, enabling and managing dynamic capabilities in the public sector. Journal of Management Studies 44, 687–708.
Paiva, E., Laureano, Roth, A., Fensterseifer, V., Evaldo, J., 2008. Organizational knowledge and the manufacturing strategy process: a resource-based view analysis. Journal of Operations Management 26, 115–132.
Peng, D.X., Schroeder, R.G., Shah, R., 2007. Linking routines to operations capabilities: a new perspective. Journal of Operations Management 26, 730–748.
Penrose, E.T., 1959. The theory of the growth of the firm, In: Foss, N. (Ed.), Resources, Firms, and Strategies: A Reader in the Resource-Based Perspective, 1st ed. Oxford University Press, Oxford, United Kingdom, pp. 27–39.
Peteraf, M.A., Barney, J.B., 2003. Unraveling the resource-based tangle. Managerial and Decision Economics 24, 309–323.
Petit, Y., Hobbs, B., 2010. Project portfolios in dynamic environments: sources of uncertainty and sensing mechanisms. Project Management Journal 46–58.
Petit, Y., Hobbs, B., 2011. Project Portfolios in Dynamic Environments: Organizing for Uncertainty. IRNOP 2011, Montreal, Canada.
Pinto, J.K., 2007. Project Management: Achieving Competitive Advantage, 1 ed. Prentice Hall, Upper Saddle River, NJ.
PMI, 2008. The Standard for Portfolio Management, Second Edition. Project Management Institute, Newtown Square (PA).
Poskela, J., Dietrich, P., Berg, P., Artto, K.A., Lehtonen, T., 2005. Integration of strategic level and operative level front-end innovation activities. Portland International Conference on Management of Engineering and Technology, Portland (OR).

Prencipe, A., Tell, F., 2001. Inter-project learning: processes and outcomes of knowledge codification in project-based firms. Research Policy 30, 1374–1394.

Priem, R.L., Butler, J.E., 2001. Is the resource-based "view" a useful perspective for strategic management research? Academy of Management Review 26, 22–40.

Prieto, I.M., Easterby-Smith, M., 2006. Dynamic capabilities and the role of organizational knowledge: an exploration. European Journal of Information Systems 15, 500–510.

Ray, G., Barney, J.B., Muhanna, W.A., 2004. Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. Strategic Management Journal 25, 23–37.

Rumelt, R.P., Schendel, D.E., Teece, D.J., 1994. Fundamental issues in strategy. In: Rumelt, R.P., Schendel, D.E., Teece, D.J. (Eds.), Fundamental Issues in Strategy: A Research Agenda. Harvard Business School Press, Boston, pp. 9–47.

Salvato, C., 2003. The role of micro-strategies in the engineering of firm evolution. Journal of Management Studies 40, 83–108.

Shenhar, A.J., Dvir, D., Levy, O., Maltz, A.C., 2001. Project success: a multidimensional strategic concept. Long Range Planning 34, 699–725.

Smith, K.A., Vasudevan, S.P., Tanniru, M.R., 1996. Organizational learning and resource-based theory: an integrative model. Journal of Organizational Change Management 9, 41–53.

Söderlund, J., 2004. Building theories of project management: past research, questions for the future. International Journal of Project Management 22, 183–191.

Söderlund, J., Tell, F., 2009. The P-form organization and the dynamics of project competence: project epochs in Asea/Abb, 1950–2000. International Journal of Project Management 27, 101–112.

Sun, P.Y.T., Anderson, M.H.Y.J., 2010. An examination of the relationship between absorptive capacity and organizational learning, and a proposed integration. International Journal of Management Reviews 12, 130–150.

Teece, D.J., 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal 28, 1319–1350.

Teece, D.J., 2009. Dynamic Capabilities & Strategic Management — Organizing for Innovation and Growth. Oxford University Press, New York.

Teece, D.J., Pisano, G., Shuen, A., 1997. Dynamic capabilities and strategic management. Strategic Management Journal 18, 509–533.

Todorova, G., Durisin, B., 2007. Absorptive capacity: valuing a reconceptualization. Academy of Management Review 32, 774–786.

Turner, J.R., 2010. Evolution of project management research as evidenced by papers published in the International Journal of Project Management. International Journal of Project Management 28, 1–6.

Van den Bosch, F.A.J., Van Wijk, R., Volberda, H.W., 2003. Absorptive capacity: antecedents, models and outcomes. In: Easterby-Smith, M., Lyles, M.A. (Eds.), The Blackwell Handbook of Organizational Learning and Knowledge Management. Wiley-Blackwell, Malden (MA), pp. 278–301.

Verona, G., 1999. A resource-based view of product development. Academy of Management Review 24, 132–142.

Verona, G., Ravasi, D., 2003. Unbundling dynamic capabilities: an exploratory study of continuous product innovation. Industrial and Corporate Change 12, 577–606.

Wang, C.L., Ahmed, P., 2007. Dynamic capabilities: a review and research agenda. International Journal of Management Reviews 9, 31–51.

Weick, K.E., 1979. The Social Psychology of Organizing, Second Edition. Addison-Wesley, Reading (MA).

Weick, K.E., 1995. Sensemaking in Organizations. Sage, Thousand Oaks (CA).

Weick, K.E., 2009. Making Sense of the Organization: The Impermanent Organization. John Wiley & Sons, Chichester (UK).

Wenger, E., 1998. Communities of Practice: Learning, Meaning, and Identity. Cambridge University Press, New York (NY).

Wernerfelt, B., 1984. A resource-based view of the firm. Strategic Management Journal 5, 171–180.

Whitley, R., 2006. Project-based firms: new organizational form or variations on a theme? Industrial and Corporate Change 15, 77–99.

Winter, S.G., 2003. Understanding dynamic capabilities. Strategic Management Journal 24, 991–995.

Yin, R.K., 2009. Case Study Research: Design and Methods, 4th ed. Sage, Los Angeles (CA).

Zahra, S.A., George, G., 2002. Absorptive capacity: a review, reconceptualization, and extension. Academy of Management Review 27, 185–203.

Zahra, S.A., Sapienza, H.J., Davidson, P., 2006. Entrepreneurship and dynamic capabilities: a review, model and research agenda. Journal of Management Studies 43, 917–955.

Zollo, M., Winter, S.G., 2002. Deliberate learning and the evolution of dynamic capabilities. Organization Science 13, 339–351.