Finding the Best Fit:
Considering the Role of Novelty in Project Selection for Small Businesses

Troy A. Voelker
University of Houston at Clear Lake

Kuei-Hsien Niu
California State University at Sacramento

Grant E. Miles
University of North Texas

More and more, small firms are operating in an environment characterized by projects. While a variety of factors may ultimately play a role in the success or failure of any given project, we argue that project novelty is likely to be an overriding factor. Project novelty, defined as the lack of relevant experience a firm has when pursuing a project, is offered as an extension of research in applicability and appropriateness of firm capabilities. We posit that project novelty enables movement past general arguments offered for generalization and specialization and moves towards specifically testable firm-project fit models. To that end this paper provides a working definition, four propositions and an estimation method appropriate for project attribute data. Implications regarding project novelty and its role in the selection and pursuit of projects are developed both for managers of small businesses and for those who advise and/or train such managers.

Projects are a special type of production process distinguished primarily by their single-shot nature. Each project is a singularity with a definite starting and ending point (Midler, 1995). A firm may engage in a series of repeated types of projects, even producing an iterative series of relatively similar projects (e.g., a contractor repeating a similar renovation in various buildings) (Bergman, Jantunen, & Saksa, 2004). A firm may also engage in multiple simultaneous projects and may, at times, share human and physical resources across projects (Tukel & Rom, 1998). Even so, each of these projects in the series retains its own unique set of temporal checkpoints and resource commitments. In essence, a project-based environment offers an ability to generate an iterative portfolio of projects (Helfat & Raubitschek, 2000).

While the project environment is, itself, a production process distinct from batch processing, assembly lines and continuous flow processing, there is evidence that a project-based paradigm is emerging even in industries typically characterized by larger batch production processes (Midler, 1995). However, a project-based environment is essential for small businesses such as CPA firms, home builders, and software developers. Projects provide benefits in learning, flexibility, specialization and cooperation not easily achieved in other production processes, in part because of their inherent rejection of the organizational design characteristics of other production processes (Bergman et al., 2004). Further, since the single shot nature of projects somewhat eschews scale benefits common in assembly line or continuous production models, small firms may be able to neutralize size disadvantages in project based environments.

While project environments represent an important organizational paradigm, realization of project benefits is not automatic. Evidence suggests that surprising numbers of projects fail to achieve their expected benefits and a great number of projects are cancelled prior to completion (Dilts & Pence, 2006). While some of these cancellations represent firm-specific choices in exercising certain project options in favor of others, many cancelled projects ultimately create wasted resource allocations. For the small firm, projects failing to launch (or even falling substantially off budget) may represent an unrecoverable loss of working capital. It is for this reason that Dilts and Pence (2006) argue identification of successful projects and project management techniques is an important task confronting both academics and practitioners.
A number of factors can come into play in determining the success or failure of a project. Complexities inherent in managing projects (Bergman et al., 2004; Park & Ungson, 2001), dealing with learning and knowledge management issues (Hoopes & Postrel, 1999), and dealing with shifting demands of the constituency for which the project was undertaken are all areas that have been studied. In examination of theory development work particular to project management (Danneels, 2002; Nambisan, 2002; Perry-Smith & Shalley, 2003; Schilling, 2003) and capability management (Eisenhardt & Martin, 2000; Gavetti, Levinthal, & Rivkin, 2005; Winter, 2003), however, evidence emerges that the specifics of projects play an important and under-studied contextual role directly impacting the success of projects while contingently influencing which resources and capabilities provide the most utility.

Accordingly, this paper focuses on the role of project novelty as a determinant of project success. Project novelty represents the relative newness of the project for the firm/project team, as determined by the projects characteristics vis-à-vis the firm/project teams experience set. A foundation for project novelty appears in literature examining projects and capability management, yet at this time project novelty itself is relatively ignored.

We begin by examining research on the relevance and importance of project management research for small businesses. From there, we move on to a discussion of firm capabilities, specifically noting the evolutionary and output dependent nature of capability research. We then draw together theory development outlining operational definitions of project novelty and posit a direct relationship between project novelty and project success. Following this we offer the concept of project novelty as an extension to studies of adaptive and evolutionary theories of firm capabilities. We argue that consideration of project novelty refines our understanding of the quantity and type of firm capabilities relevant to specific project success. From there we discuss potential measurement complications with project novelty and offer a potential measurement method. The paper concludes with a discussion of applications and implications of project novelty.

**SMALL FIRMS, FIRM CAPABILITIES AND PROJECT MANAGEMENT**

Researchers have long recognized the importance of small businesses. Small business has a tremendous impact on an economic ecosystem, often providing the plurality of job creation (Audretsch, 2003), sales growth and innovation (Connell, 2009; Lerner, 1999). Small businesses are perceived as having advantages in flexibility (Gelinas and Bigras, 2004) and learning opportunities (Beekman and Robinson, 2004) over their large business counterparts. However, small businesses also face an array of disadvantages to offset their strengths.

Small firms often face challenges obtaining needed capital (Carter and Rosa, 1998; Verheul, Risseeuw and Bartelse, 2002) and the mortality rates for small businesses, particularly minority owned small businesses, are quite high (Robb, 2002). Additionally, despite their technical knowledge, small business operators often lack the business training and acumen to fully realize the potential for their firms (Chaganti & Parasuraman, 1996). Recognizing these resource limitations, Porter (1991) advises that a strategic orientation is paramount for the success of the small firm.

Small business researchers are increasingly recognizing the importance of a project-based environment for small firms. Many small businesses, such as home construction and renovation firms (Randolph and Ellis, 2007), web-developers (Roberts, Cheney, Sweeney and Hightower, 2004), professional consulting firms (Monder, 1999) and aerospace and defense contractors (Voelker & McDowell, 2011) operate in a natural project environment. Indeed, significant innovations regularly emerge from recipients of small business innovation research (SBIR) grants, which fund on a project basis (Audretsch, 2003). Similarly, small firms are advised to consider phased-growth projects in the management of their internationalization efforts (Cieslik, Kaciak and Welsh, 2011).
While projects are important strategic assets for the small firm, project management capabilities in the small firm may preclude realization of potential benefits. Biases in project management processes can obscure key success factors for small business operators (Park, Chinta, Lee and Yi, 2011). Additionally, small business operators often fare poorly in project selection and pre-project planning (Randolph and Ellis, 2007). Small firms often rely on social network connections, rather than market research projects when selecting potential export markets (Williams, D., 2009). This lack of project management sophistication is linked to reduced opportunity exploitation. In our study, we emphasize the importance of firm capability and project fit as one potential remedy to these project selection problems. Developing our propositions requires a discussion of firm capabilities and project management.

REGARDING CAPABILITIES OF FIRMS

The dynamic capability (DC) perspective builds from the views of Schumpeter and the evolutionary economic work of Nelson and Winter (Nelson & Winter, 1982; Schumpeter, 1942). It has received primary attention in recent years through the work of Teece and colleagues and Eisenhardt (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). The key elements of this area of theory are an emphasis on portfolios of capabilities and an evolutionary environmental perspective.

Firm capability theories recognize that firms excel in a range of activities and, further, the distribution of capabilities is idiosyncratic to the firm. Winter (2003) observes that “an organizational capability is a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type (pg. 983).” Helfat and Peteraf (2003) similarly define a capability as “the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result” (pg. 999). The emphasis, in both definitions, is on the firm’s ability to transform inputs into outputs with the firm’s capability set ultimately representing an indication of its ability or effectiveness in reaching various goals (Helfat & Peteraf, 2003).

The evolutionary environmental perspective positions these capabilities in a non-static world. The competitive landscape which the organization resides in is populated by numerous organizational entities, each engaging in innovative and imitative learning processes (Nelson & Winter, 1982). Learning is an iterative, path-dependent process influenced both by the effectiveness of external search mechanisms and the historically influenced position of a firm’s current capability set (Bergman et al., 2004). At any given point in time, each organization occupies a unique capability portfolio position influencing firm specific differences in abilities to effectively perform specific activities (Helfat & Raubitschek, 2000).

The path-dependent perspective captures two important points influencing DC research. First, while a firm’s capability set is intangible, the performance effectiveness of a firm is considered a visible manifestation of the firm’s capabilities (Stock & Tatikonda, 2000). Second, the current manifestation of capabilities is influenced by prior period capabilities which are estimated through past period performance outcomes (Rouse & Daellenbach, 2002).

A firm’s past portfolio of products provides a platform for learning (Helfat & Raubitschek, 2000). Additionally, through search routines, the firm may learn vicariously from others, particularly others with relevant achievements (Winter, 2000). By obtaining the features deemed most relevant for future success and applying them to new generations of products, the firm leverages internal and external knowledge reservoirs towards future product portfolios (Gavetti et al., 2005). While all firms are likely to engage in search and learning processes, not all firms are equally effective in identifying relevant knowledge and applying such knowledge effectively in the product development process. The firm’s absorptive capacity is considered the critical conduit enabling or obstructing the effectiveness of both searching and learning processes (Cohen & Levinthal, 1990).
Cohen and Levinthal’s (1990) contribution of absorptive capacity offers an interesting lens in understanding how dynamic capabilities evolve. They posit learning as a function of prior knowledge, a concept linking absorptive capacity to the path dependencies commonly associated with dynamic capability theories. Further, they value both intensity and diversity of knowledge. Intensity refers to depth of experience in a given domain while diversity focuses on breadth of experience across multiple domains. In essence, two separate knowledge paths are being detailed (Zahra & George, 2002). The first path involves incremental learning advances along existing paths, directly relating to the depth of knowledge in a given area. The second path reflects the generalists’ advantage. In this path, application and linkages across knowledge domains enable new and novel recombination in which comparatives and extensions may naturally occur. Using Cohen and Levinthal’s guidelines, both depth and breadth of experience appear important in learning, albeit potentially for different learning objectives, and each gives the firm the potential to outperform those with lesser absorptive capacity endowments (Crossan, 1999; Hill & Rothaermel, 2003).

Studies utilizing measures of depth as indication of capabilities typically emphasize the magnitude or extent of experience a firm has in a specific activity. The dominant logic holds that having more of a relevant experience base improves the performance capacity relative to firms or domains with lesser quantities of experience, and the findings of empirical studies using depth of experience support the theoretical arguments. That is, firms with more of a specific capability tend to excel at the execution of tasks related to that capability (Ahuja & Katila, 2004; Ethiraj, Kale, Krishnan & Singh, 2005; Hayward, 2002; Singh, 1997). This is why we might expect a CPA with experience in green tax laws to move more easily into green or renewable consulting than a CPA without such experience, or an architect with some exposure to Leadership in Energy and Environmental Design (LEED) building guidelines be more successful in designing for LEED certification (www.usgbc.org) than a competitor lacking such experience.

However, two interesting findings suggest limits to the nature of experience benefits. First, over-reliance on depth of experience does not produce uniformly positive results. Specifically, two studies have found instances where second order effects were negative (Jones, 2003; Katila & Ahuja, 2002). This suggests that depth of experience produces positive benefits to a point of inflection; however, it remains undetermined whether the inflection represents a point of diminishing returns or a true inverted u-shape with negative implications of increasing experience. The second finding relates to the mobility of experience. While experience dividends accrue for areas directly related to the experience capability, increasing levels of experience appear to lock a firm into its current path trajectory and may obstruct movement into other segments for the same technology (Cottrell & Nault, 2004). Thus, deep experiences may explain the tendency for high regard and reviews among Broadway musicals and the prominence assigned to MBA programs (Rindova, Williamson, Petkova, & Sever, 2005; Uzzi & Spiro, 2005), but the general innovativeness and creativeness of incumbents are often found to be less impressive than that of new entrants (Christensen & Rosenbloom, 2000; Kotabe & Swan, 1995).

Taken together, these findings suggest that depth experience benefits are contextual. Deep experiences, applied to activities highly similar to the existing knowledge stock, results in superior performance. For example, a small engineering firm may build significant skills and a good reputation focusing on engineering activities related to new housing developments. However, having an abundance of experience in one segment may, in fact, obstruct the ability to perform in other areas (e.g., the same engineering firm may have trouble moving into other engineering areas during a slump in the housing market).

Where depth capability studies suggest that depth provides performance capability, breadth capability studies suggest that breadth generates adaptive capabilities leading to the evolution of more radical changes in dynamic capabilities. This is a consistent theme in the theoretical literature contrasting...
depth and breadth and may be summed up using the adages “practice makes perfect” and ‘jack-of-all-trades, master of none.” The thrust of studies examining breadth of capability is the concentration, or dispersion, of focus within a firm’s capability portfolio. Where depth explores whether a present firm action is supported directly by past firm actions, in breadth the interest is on whether the firm diversifies or engages in exploratory activities. It is less about how much specific experience a firm has at that activity and more about whether a firm’s only experience is with that activity.

Findings are mixed in determining the value of breadth of experience for firm performance. In at least some instances, having a wide breadth of experience appears to be positive. For example, diversity of experience amongst managers has been shown to associate with higher performance both in high-tech firms (Smith, Smith, Sims Jr., O’Bannon, & Scully, 1994; Eisenhardt & Schoonhoven, 1990) and in production teams for Broadway (Uzzi & Spiro, 2005). In addition, Voelker and McDowell (2011) note that, in aerospace related industries, small firms producing a broad array of goods and services are more likely to be recipients of future contracts than narrowly focused small businesses. Other studies, however, find that the benefits of breadth of experience reach a maximum at some point (e.g., Hayward, 2002; Palich, Cardinal & Miller, 2000) or are dependent on the particular experiences examined (e.g., Stern & Henderson, 2004). Cotrell and Nault (2004), for example, found that producers of software who offered more products, products in more categories and who were more diversified proportionally across platforms were less likely to fail, but firms who released products on the largest number of platforms and were proportionally more diversified across categories of products were more likely to fail.

A similar set of results emerge from studies in the biotech industry; an interesting industry both because of the large number of breadth-capability studies, but also because of the proclivity for project based small research firms. In this industry, broad experience across product segments is associated with increased patent output (Shan & Walker, 1994). Diversity of experience among management, however, demonstrates no explanatory value in explaining patent output (Nicholls-Nixon & Woo, 2003). In another study, the number of market segments a biotech firm engaged in positively related to the number of products in development, but negatively related to the number of products successfully being brought to market (Rothaermel & Deeds, 2004).

Finally, some studies have returned no significant results regarding breadth of experience. In the hospital software industry, for example, technological diversity, measured by product releases across complexity-categories, and diversity in new product portfolios had no significant impact on firm survival (Singh, 1997). Similarly, among not-for-profit firms and firms preparing for IPO’s, increasing levels of diversity provided no significant explanation for performance success (Echols & Tsai, 2005; Hager, Galaskiewicz, & Larson, 2004).

Thus, while the propensity of relationships for breadth of experience appear to be positive, diminishing returns, negative relations for extreme diversity, and insignificant relations all appear. By and large this offers strong evidence for a contingent value for breadth experience. Apparently, sometimes generalization helps and sometimes specialization helps. Further, within a single set of activities, a firm might be advised to specialize in some aspects of an activity and generalize in other aspects of an activity. While consistent with empirical results (Cottrell & Nault, 2004), this position has not been specifically advanced or tested within the literature. Lacking examination of the relative fit of firm capabilities to the projects attributes, such examination is currently infeasible.

Combing the results on capability breadth with those on depth reviewed earlier, however, provides some interesting insight. Specifically, four archetypical configurations of a breadth and depth interaction can be detailed (see Figure 1). Firms can function as a pure specialist (high depth, no breadth), a pure generalist (high breadth, little depth), a newcomer (no depth, no breadth), or a fourth configuration involving single area specialization (high depth) with exploration thrusts into other areas.
(some breadth). This last configuration, which for now we refer to as learning firms, identifies specialized firms whose occasional breadth efforts appear focused on gaining new knowledge to bring back to their working domain.

Figure 1. Breadth and Depth Configurations

While descriptive, however, these archetypes built from the firm capability literature offer little predictive insight into the likely quality of output from and specific potential project. Currently, work in this area addresses primarily the economic impact or the portfolio quantity impacts of these configurations. Further, despite our documented findings that some depth of experience helps, but too much may hurt, and that some breadth of experience is useful while too much may underperform, we lack the ability to offer prescriptions to practitioners as to where these inflection points lie. Our literature notes that capability matters, but we have few tools to apply this understanding towards a project selection exercise and the existing modeling (e.g., Nelson & Winter, 1982) is too complex to lend itself to practical application for small firms.

Since research suggests that failed projects abound, aligning our capability theories towards the project outputs of those capabilities is paramount. Research needs to examine whether the output quality itself differs based on the configuration of a firm’s capabilities relative to the activity. Extending our research in this direction offers the potential for pre-screening project-selection models identifying projects most (and least) likely to succeed. Developing this idea further is aided by placing firm activity into a project context and exploring the role of projects, project management, project complexity and project success.

PROPOSING PROJECT NOVELTY

Firm capability and project management theories each offer insight into the nature of project novelty. Research on firm capabilities demonstrates that firms with relevant and related experience are more likely to experience success in similar endeavors (Ahuja & Katila, 2004; Nerkar & Roberts, 2004; Singh, 1997). Similarly, firm capability breadth suggests that generalization (and its counter specialization) play a role in a firm’s likely success when approaching new or novel capabilities (Lavie & Rosenkopf, 2006; Phene, Fladmoe-Lindquist & Marsh, 2006). The converse of this argument is that the more novel the current endeavor is as compared to past endeavors, the less likely the firm is to experience success with the endeavor.
Regarding project management, the relationship between capabilities and performance is precisely the point Stock and Tatikonda (2000) address stating, “in general a technology that is more novel, complex and/or tacit will be more uncertain than a technology that is familiar, simple, or well defined (pg. 724).” Similarly, Helfat and Raubitschek (2000) note that incremental learning “improves upon but does not fundamentally depart from current knowledge” (pg. 966), while step-function learning “involves fundamental changes to core or integrative knowledge (pg. 967).” Taking this notion further, Hill and Rothaermel (2003) note that the attribution of incremental or radical for an innovation is itself contingent on the skill-set of the creator. Thus, an innovation project may seem a straightforward extension for an entrepreneurial start-up put together expressly for that purpose, while the same project might appear radical to a more established firm in the same industry whose capability set is different. Perry-Smith and Shalley (2003) echo this idea, observing that the concept of creativity exists on a continuum anchored by incremental, or similar, to radical, or dissimilar.

The logical conclusion from such a series of arguments is that novelty is a relative, not absolute, concept. A project that is novel to one firm may be quite familiar to another. Our theories recognize that the capability sets of firms are asymmetric and the features of a project are contingent on the needs of a constituency. Different firms are thus more or less able to address the demands required to complete a given project. To the extent that the appropriate capability set manifests, the project becomes relatively simple (Stock and Tatikonda, 2000). Conversely with novel projects, when the project requires capabilities outside the firm’s capability portfolio, complexity increases (Ethiraj et al, 2005). As an illustration, we would expect a custom home builder with prior practice building to LEED certification to experience fewer errors and cost-overruns than a competitor with no such experience.

Taken together, this suggests that when evaluating a project’s potential for success it is important to examine the relative novelty of that project vis-à-vis the capability portfolio of the firm. As such, we can offer:

**Proposition 1:** Heightened Project Novelty increases the likelihood of project complications and decreases the likelihood of project success.

**DIFFERENTIATING PROJECT NOVELTY FROM FIRM EXPERIENCE**

While project novelty and depth of experience share a common determinant in that they both examine manifestation (or lack thereof) of domain experience, they in fact address separate questions. Project novelty asks whether a firm has experience across all relevant project attributes while depth of experience expresses how much experience a firm has in a given attribute. Project novelty ultimately addresses whether familiarity exists across a series of features. Depth of experience, as traditionally modeled, addresses magnitude of experience within a single feature (e.g. Henisz & Delios, 2001; Rindova et al., 2005; Tsai, 2001). Project novelty examines the myriad important features of the project and increments upwards for any given feature area the firm lacks experience. Project novelty is, therefore, a more holistic evaluation of the fit between the firm’s experiences and the project’s features emphasizing the areas where the firm lacks experience.

Consider a hypothetical software project and several small software firms. If the project were evaluated by attributes along the lines defined by Oliver (1990), we would record the platform, constituency, and feature set of the proposed project. Allow that the software product will run on Windows Mobile devices, be targeted towards business professionals, and integrate multi-user network functionality. With the project defined thusly, consider the experience set of potential software development firms listed in Table 1. For each of the projects features, we list the number of similar projects each hypothetical firm has developed. In studies using firm experience as a basis (e.g. Soh, Mahmood & Mitchell, 2004), we would typically argue that Firm A or Firm C has the most experience – which is
accurate over one or two dimensions of the project. If we consider project novelty as a function of lack of experience across all relevant dimensions, however, Firm B faces the least novelty since it has some experience with each facet of the project.

Table 1. Firm and Project Interaction

<table>
<thead>
<tr>
<th>Firm</th>
<th>Platform Experience</th>
<th>Business-user Experience</th>
<th>Multi-user Experience</th>
<th>Project Novelty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm A</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Firm B</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Firm C</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
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</table>

Ultimately, the difference between the suggested project novelty approach and traditional depth of experience approaches lies in the question of when (or how) experience translates to capability. Under our current capability depth framework, experience is studied additively, with each experience unit carrying the same weight, even though we recognize the role of learning curves and diminishing returns in learning outcomes. Changing our focus from “how much” experience to “whether any experience exists” may produce relevant alternatives compatible with our existing theory.

In practice, of course, a given project may well have more than the three relevant product attributes used in our example, and may well require significant consideration to determine which project and capability facets to include. Using project novelty to examine firm-project fit, however, should offer insight as to which specific capabilities are more, or less, relevant. Recalling that some experience sets produce diminishing returns at heightened levels (Jones, 2003; Katila & Ahuja, 2002), it is probable that simultaneous examination of capability depth and project novelty would distinguish between sticky and malleable capabilities. In short, some avenues for learning new capabilities are likely to be more productive than others; firm-project fit offers a lens to explore this phenomenon.

The level of project novelty hinges on whether a firm chooses to engage in projects inherently similar (or dissimilar) to past projects. When firms stretch their existing competency set and move in relatively new directions, evidence suggests that certain firms make these moves more successfully than others (Gavetti et al, 2005). Thus, when a firm leverages its capabilities towards the creation of new products, the success of that endeavor is moderated by the novelty of the project. Past research suggests that a firm’s breadth of experience influences ability to move into new directions. Use of project novelty is, therefore, a candidate for unraveling a moderating effect between level of firm specialization and potential project successes.

FIRM CAPABILITY BREADTH

Each firm contributes an idiosyncratic capability portfolio to the new product development project (Winter, 2003). Breadth capability measures evaluate the extent to which a firm spreads around its capabilities (Zahra and George, 2002). Even among smaller firms, there is likely to be variability in the number of activities undertaken. Some firms specialize in a very narrow range of activities while others generalize across broad ranges (Voelker and McDowell, 2011). Still others specialize to a degree but engage in small learning thrusts into new capability areas. While depth measures conceptually represent quantity of performance capability, breadth addresses the adaptive capability of a firm. Highly specialized firms are generally successful in incremental adaptation. In other words, such firms are trapped in their vector of activity and more likely to generate successes within that vector. The pure generalist, who balances capabilities relatively evenly across domains, is able to bring together diverse capabilities resulting in creative new products (Hill and Rothaermel, 2003).
Ultimately, this complicates direct predictions between capability breadth and project success. There are scenarios where both narrowly focused and broadly focused firms should excel. Specialists should excel when the project closely relates to their current competency set, and generalists should excel when confronting relatively more complex projects. Unraveling this contingent relationship therefore requires examination of the moderating effect of project novelty (Stock and Tatikonda, 2000). Project novelty is an indicator of the similarity or difference of a project. As such, the interaction of breadth and project novelty should explain the distinct conditions under which the upper and lower bounds of breadth capability excel. Following the logic laid out earlier:

**Proposition 2:** Specialization provides benefits when project novelty is low. Firms (or project teams) with specialized capabilities will encounter fewer project complications and enjoy a greater likelihood of success when selecting projects with low project novelty.

**Proposition 3:** Generalization provides benefits when project novelty is high. Firms (or project teams) which generalize their capabilities will encounter fewer project complications and enjoy a greater likelihood of success when selecting projects with greater project novelty.

Breadth indicators of capabilities address the scenarios under which a generalist and specialist should each excel. As noted earlier (see Figure 1), however, a third distinct potentially successful archetype exists. The learning firm archetype embodies the prescriptions of organizational learning. Organizational learning enables firms to absorb knowledge and experiences that are embedded in various kinds of repositories such as operational routines, systems, structure, culture, and strategy (Crossan, 1999; Nelson & Winter, 1982; Walsh & Ungson, 1991). The organizational learning system is comprised of the continually evolving knowledge stored in project groups and constitutes the fundamental infrastructure that supports a firm’s implementation of projects (Crossan, 1999). Organizational learning processes can be considered as internal interpretive systems effectively lowering the novelty clouding projects and assignments (Daft & Weick, 1984). Due to the fact that learning organizations serve as a place where constituents continually expand their capacity for creating desired results, broad patterns of thinking and encouragement of collective aspirations emerge (Senge, 1990).

Organizational learning enhances firms’ absorptive capacity, enabling them to consistently gather or “know” information relevant to their operations (Cohen & Levinthal, 1991). The major difference between a learning organization and specialization and generalization lays in the fact that the learning organization’s continued information collection processes from the environment helps develop a set of strategic portfolios, which increases the firm’s flexibility and mobility when facing uncertainties (March, 1991). There is a difference, however, between Adaptive Learning, which emphasizes solving problems in the present (Scott, 1987) and making improvements to current operations, and the ongoing “adaptable” associated with a learning organization.

To maintain adaptability, learning organizations need to operate as “experimenting” or “self-designing” organizations, meaning firms should maintain a state of frequent, nearly-continuous change in structures, processes, domains, goals, etc., even in the face of apparently optimal adaption of existing operations (Hedberg, Nystrom, & Starbuck, 1976; Nystrom, Hedberg, & Starbuck, 1976; Starbuck, 1983). Operating in this mode is almost required for survival in fast changing and unpredictable environments (Hedberg & Jansson, 1977), but may be relevant even in more stable environments for smaller firms. Such firms typically have less in the way of slack resources, and thus are less likely to survive significant periods of poor performance stemming from slow response to environmental demands.
Through ongoing experimentation, organizations learn about a variety of design features, remaining flexible towards internal and external forces. Note that such experimentation need not overly tax smaller firms’ operating capacity. Learning organizations engage in small or infrequent exercises outside their domain area, often through partnerships with other firms. In doing so, they develop capabilities that should allow them to outperform the other archetypes when engaging in activities somewhere between incremental and radical (Hayward, 2002), such as bundling new features or components to existing product lines.

In summary, then, the above argument suggests that as a firm takes on projects outside its competency set, the learning firm will outperform the generalist who will outperform the specialist. However, as the characteristics of the project move quite outside the capability set of the firm, the advantage shifts to the generalist. Here, the performance (depth) benefits become negligible and primarily the adaptive (breadth) benefits matter.

**Proposition 4:** When facing projects of modest (low, but some) novelty, learning firms should outperform generalists, and generalists should outperform specialists.

**MEASURING PROJECT NOVELTY**

The question then becomes, how best to determine a project’s novelty? Oliver (1990) suggests that domain overlap plays an important role in project novelty and that similarity of service-features, similarity of clients and similarity of outputs influences domain overlap. Stock and Tatikonda (2000) suggest that the factors which increase novelty include technology familiarity, technology newness, discontinuous technology changes, platform changes and scope changes. With the exception of discontinuous technologies, the remainder of this evidence suggests that measurement of project novelty involves a comparison of the target audience and feature set across a number of categories (e.g., platforms, processes, constituency, etc.). To the extent that the shadow of past project attributes fail to overlap the attribute set of the current project, the more novel the current project and the less likely the project is to hit the mark.

In Table 1, we offered a tentative approach to estimating project novelty in software development. The approach explained here uses three steps. First, preliminary examination of a comparable set of projects (e.g., software applications) is necessary to predetermine the appropriate categories to estimate experience (and the lack thereof). In a testing format, this will necessitate involvement of practitioners and multiple rounds of discussion to hone in on the appropriate set of attributes that increase project complexity in a general sense. Further, panel discussion with experienced professionals can typically reduce the list to essential project dimensions with relative ease.

While the project attributes detailed in Table 1 apply to software development, it is not hard to speculate on relevant project attributes for other types of small businesses. Event planners, for example, might consider the constituency, the type of event, the scale of event, and the timeframe for planning. Custom home builders, in contrast, might consider the materials, basic design types, and geographic locations (for building codes and foundation issues), and consultants might consider the industry, strategic orientation, and internal/external specialization requirements. Bakers who make specialty cakes (in coordination with our event planner) might consider the type of event, timeframe and any special ingredient requirements. In our discussions with project development practitioners in various industries, lists of project attributes influencing novelty are generally quite easily generated.

Second, once this general list of attributes has been modeled a population of projects (e.g., software releases) can be collected and coded for the appropriate level for each attribute (e.g., for platform one
might use Windows, Mac OS, Windows Mobile, Palm OS, etc.). With an appropriate profile developed for each project, a time lagged period (e.g., preceding 24-months) can be used to develop experience sets for each participant firm.

Third, once product and firm profiles have been developed, calculations for each firm and project interaction can be estimated using standard measures for breadth of experience (see Cottrell & Nault, 2004; Ruef, 2002) and project novelty as defined above. Given an appropriate measure for project success (user satisfaction, time overruns, etc.), a testable data set emerges.

There are methodological limitations with our operational depiction of project novelty. Although theoretically argued (Stock & Tatikonda, 2000; Verona, 1999), project novelty is untested in our current literature. We suggest modeling project novelty as the absence of experience across relevant categories and using an iterative method to ramp up project novelty. While matching theories of project novelty (Verma & Sinha, 2002; Verona, 1999), it creates an estimation problem wherein measurement of project novelty takes the form (at least in part) of a commonly used predictor, depth of experience.

Addressing this concern, we note similar cross-contamination already exists between two common capability measures, depth and breadth of experience. Using our current methods, firm depth of experience also provides the basis for established entropy measures used in the breadth measures. Entropy measures use a relative weighting of depth in each level of experience associated with measurement of a given category (i.e., the various levels associated with the category platform become the proportional weights to evaluate breadth measures of platform). In the current state of our research, we use the visible manifestation of an activity as the presence of some capability. Barring unfettered, long-term access to multiple project teams, it seems reasonable to use the lack of manifestation as the indication of a lack of capability – thus increasing project novelty. In this sense, project novelty is necessarily burdened with the same measurement challenges common to strategy research on firm capabilities.

In addition, the iterative method we suggest, while appropriate at this stage of development, gives only a broad indication of the relative impact of lack of experience in each category. Two refinements would appear worthy of further exploration. First, as offered, the measurement approach treats all dimensions of novelty as carrying equal weight. In reality, some dimensions are likely to be more important than others. To address this, each project dimension could be re-coded dichotomously for whether firm experience is present (or absent) for each category (e.g., platform, users, etc.). Using this dichotomized set of categorical predictors (0=no experience, 1=some experience) with a relevant performance dependent variable in a conjoint analysis would provide an estimation of the part-worth value of ‘lack of experience’ in each category. These part-worth values could potentially then be used in a summed format to move the relative complexity measure from a ‘count’ indicator to something closer to a continuous measure. Modeled thusly, the approach would be akin to exploratory factor analysis (or perhaps, more specifically SEM factor loading) in that the raw data ultimately contributes to a more refined measurement of relative complexity.

A second related refinement would address the fact that the approach to project novelty we have suggested involves equal weighting to increment each of the indicators. Arguably, if lack of experience increases project novelty, the proposed measure is sound in its incrementing process. The measure itself is crude, though, to the extent that it fails to take into account the relative worth of lack of experience in each category. We believe that this limitation reflects the newness of this theoretical construct and opens the door for future research. Repeated research, in a given industry, could evaluate the proportional contribution of lack of experience in each categorical area enabling refinement of this measure for that specific industry.
Even so, a generalization problem emerges moving from industry to industry. Project novelty should increase given lack of experience in relevant categories. However, identification of the appropriate relevant categories is virtually impossible a priori. The iterative method offered is appropriate in an exploratory capacity and the basic template lends itself to refinement over time.

**DISCUSSION AND PRACTICAL IMPLICATIONS**

We have offered consideration of project novelty, defined as the lack of relevant experience a firm has when pursuing a project. This concept overlaps with firm capabilities and is offered as an extension of research in applicability and appropriateness of firm capabilities. Our primary purpose is to enable a contingency approach to firm capability theory. We posit that project novelty enables movement past general arguments offered for generalization and specialization, moving research towards specifically testable firm-project fit models. This paper provides a working definition, four propositions, and an estimation method appropriate for project attribute data.

In this paper, we have used the firm as the level of analysis and the firm-project fit as the primary focus. To this end, the propositions advanced are relevant for small firms operating in industries where project based production are common (e.g., films, software, and commercial construction) or for any firm facing significant projects (e.g., mergers, opening a new location, new product development). We believe this approach offers potential to test relationships between capabilities, project novelty and project success. Further, this approach could be used to predict project selection models and risk models for firm’s wishing to extend their current capability set. Additionally, while the paper and propositions are advanced at the firm level, the concept of project novelty should be usable in any project environment lending utility to intra-organizational studies.

As noted, the measurement approach offered has its shortcomings in teasing out differences in research studies. At the same time, the measurement burdens raised may, in fact, represent an advantage of the project novelty concept. Competitive intelligence and project selection, while crucial, are time consuming and potentially excessively complex for small business practitioners. A model wherein the project manager of the small firm distills project attributes to a handful of key elements and then tracks experience by its presence (not magnitude) is less time consuming.

Further, from a complexity standpoint, the implications of our propositions are relatively straightforward. Small businesses should choose projects with little (but some) project novelty, and the practitioner should understand that the more novel the project the more difficult the execution. There is evidence that the value of market intelligence in small firms depends to a significant degree on whether it can be related to firm project and innovation efforts (Verhees and Meulenberg, 2004). Similarly, it has been argued that innovative thrusts of small firms are more likely to succeed when these efforts are related in some way to day-to-day operations (Sexton & Barrett, 2003). The notion of determining project novelty before undertaking new efforts should thus help managers find the projects with the greatest chance of success.

Finally, the practitioner is advised to recognize that the learning value of the slightly novel project is probably best realized on subsequent projects. As Gann and Salter (2000) note, the ability to integrate the learning from a project into existing processes and capabilities is a key to improving performance across a portfolio of projects over time. Similarly, Liao, Welsch and Stoica (2003) have argued that growth in small and medium-sized firms is facilitated when external knowledge acquisition can be disseminated within the firm, and Gray (2006) notes that absorptive capacity is an important prior condition for small firm innovation and growth. Because project novelty is a relative, rather than absolute, notion, managers can utilize it to determine which projects are best for their firm in order to both build on and extend existing capabilities and best position the firm for future opportunities.
While the above two implications are geared towards the small business operator, it seems noteworthy that these same implications manifest for student-led or professional consultants advising small businesses. Presupposing the validity of our propositions, when evaluating the current state of the small business, the consultant is advised to consider the project novelty fit of recent (or planned) firm actions to those of past firm actions. When the project novelty of such ventures is high, the consultant should advise against such project selection. Assuming the small business operator remains adamant in the pursuit of novel projects, the consultant should consider a phased project implementation which lowers the project novelty impact on the firm at any given point in the project.

Similarly, educators counseling student consultants should utilize project novelty theories in their evaluation of student-consultant recommendations. When student-consultants propose recommendations for small-business clients, the educator tasked with evaluating the plan should consider project novelty as a relevant predictor of the feasibility of the student action plan. While our propositions do not suggest the elimination of project novelty, they do suggest that when novelty is high, firms should have an implementation path in place to minimize the expected detrimental effects of high project novelty. A student action plan high in project novelty lacking consideration for the high novelty might be considered an inferior submission to either a lower project novelty recommendation or a plan with high project novelty that includes conscious implementation steps.

CONCLUSION

The principle limitation of the proposed research stream is its inherent industry-specific emphasis. That is, relevant categories and levels are only comparable given projects which are inherently similar, which restricts measurement to a single industry at a time. Given that current firm capability research emphasizes repeated studies in certain industries (biotech, software, petrochemicals, etc.), this limitation is not inherently problematic. However, it is important to recognize that while broad findings may provide cautious guidance regarding project novelty, specific results for one industry may have little to no generalization across industries. Even so, refined knowledge within an industry has merit and the limits to between-industry generalization should not prohibit usage.

The importance of fine tuning project selection processes cannot be understated. For the small, project-oriented firm, the difference between bankruptcy and profitability can hinge on the success or failure of one project. To the extent that critical reception of a project is highly and positively correlated with financial outcomes (Uzzi & Spiro, 2005), small improvements to a project’s potential outcome can produce meaningful differences for companies. To this end, project novelty offers an addition to firm capability analysis. It builds off an established premise that the movement from no experience to some experience is crucial. It also extends from the premise that a more detailed evaluation of project attributes is important to understand the appropriateness and applicability of firm capability sets. The estimation method, concept and propositions offered for project novelty are appropriate for projects in many different industry settings even though the findings of any specific study may be limited to industry specific settings.

REFERENCES


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