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THE IMPORTANCE OF PLANNING PROCESSES: IMPACT ON FINANCIAL AND INNOVATION OUTCOMES

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF PSYCHOLOGY

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Dedication

What a journey. I cannot begin to thank my support system that has afforded me the ability to make this transition. First, I want to thank Brandon. You have been the rock that has allowed me to enjoy life. Just when I thought I couldn't continue, you made it possible to see through the haze and enjoy the little things. I love you and can't wait to see what is in our future. Second, I would like to thank Michele, Danielle, and Paul. Your family is quite possibly the most unselfish group of people on the face of this earth. When times got tough and the end was so far out of sight, you took me by the hand and led me through. I am forever indebted to you and am eternally grateful for your acceptance and love. Finally, I want to thank my family for your continued encouragement and love that has always been afforded to me. Just when you think it isn't possible, my support system made it ok. I love each and every one of you.

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Abstract

Planning is one of the most influential factors pertaining to performance in organizational settings. Given the continuous changes in technology, competitive pressures, and consumer expectations, organizations and groups must plan how they will respond to such actions and changes. This study included 119 technology-based organizations and their corresponding website content pertaining to planning variables. This research indicates support for the planning model presented by Mumford, Bedell, & Hunter (2008). More specifically, institutionalization of innovation planning processes play a vital role in financial and innovative success. The implications of these findings and future research ideas are discussed.

Introduction

Planning is one of the most influential factors pertaining to performance in organizational settings (Bluedorn, Johnson, Cartwright, & Barringer, 1994; Mumford, Schultz, & Osburn, 2002). Given the continuous changes in technology, competitive pressures, and consumer expectations, organizations must plan how they will respond to such actions and changes (Dean & Sharfman, 1996). Likewise, groups within the organization must decide how to distribute the workload amongst different people and how and when that work will get done (Weldon, Jehn, & Pradhan, 1991).

Several lines of research have confirmed that planning does in fact play a central role in how organizations perform both in regards to innovative efforts and financial outcomes. Catrogiovani (1991) found that planning may influence the success of entrepreneurial ventures when financial support is required and the environment is turbulent. Along related lines, Schwenk and Shrader (1993) conducted a meta-analysis on financial performance and how it relates to strategic planning and found planning to be a significant factor on performance across studies. Furthermore, research by Low, Chapman, and Sloan (2007) found that in order for an organization to increase its financial performance, they should increase their market orientation and innovation activities. Thus, one can infer that organizations depending on innovative products (i.e., technology-based organizations) need a structured planning process in order to become financially successful, as well as successful with introducing new products to market.

Given the notion that planning does in fact have a considerable effect on financial and innovative success, the next question becomes what factors contribute to

a successful planning effort. Clearly, planning efforts have many stages and processes organizations must go through in order to make informed decisions. Given the complexity of these stages, or processes, it has proven difficult to develop viable models for the process for planning (Kamoche & Cunba 2001; Mumford, Bedell, & Hunter, 2008). One underlying problem that has blocked the development of such planning models is the prevalence of scholars focusing on a single level of analysis. In other words, promising research has revealed hypotheses detailing individual level concerns (e.g., O'Connor, 1998), while others have focused on organizational level issues (e.g., Sharma, 1999). Given the lack of research involving multi-level considerations, Mumford, Bedell, and Hunter (2008) put forth a general model of innovation planning processes taking organizational, group, and individual level considerations into account.

Given the relative newness of the model for innovation planning put forth by Mumford and his colleagues, and the limited empirical evidence supporting their multi-level model, the intent of the present research is to examine the specific organizational and group level variables pertaining to planning for innovation. Furthermore, this article will provide empirical evidence supporting which organizational and group levels variables relate to financial and innovative organizational success.

Organizational Level Influences

Scanning and Monitoring

In order for a plan to be initiated, definition of themes to be explored is an integral stage in the planning process that serves to set the framework around which

further plans will be built (Mumford, Bedell, & Hunter, 2008). Here the organization examines both the external and internal environments to deduce trends the organization deems relevant for pursuit. Many scholars have pointed to the significance of environmental scanning. For example, D'Aveni and MacMillian (1990) looked at survivors of bankruptcy and found that those who survived the strain focused on external sources of information, as compared to their bankrupt counterparts who spent more time focusing on internal factors. Along similar lines, findings show that companies were more likely to introduce innovative products when they gathered customer and supplier feedback, conducted market research, and monitored competitors and emerging technology (Souitaris, 2001; Koberg, Uhlenbruck, and Sarason, 1996).

Just as external environmental scanning has shown to be important to innovation planning, monitoring of the organization's internal environment has also shown to be worthwhile. Damanpour (1991) conducted a meta-analysis on the determinants of organizational innovation and found that internal monitoring efforts prove to be useful when they focus on: 1) early stage outcomes, and 2) capitalize on the expertise of their internal work force. Other research by Ford and Gioia (2000) found that focusing on daily internal problems served as a stimulus for innovation.

One would also suspect that the variety of themes brought into focus may also play an important part in innovation planning. This concept rests on the assumption that emergent themes often come into view from technologies or competitor actions that are not directly linked to the organization's internal environment (Mumford, Bedell, & Hunter, 2008). Research backing this assumption comes from a study by

Rodan (2002). Their study looked at 106 managers from a high-technology company and found that managers working within atypical networks were more likely to initiate innovative projects.

Along similar lines, it is also plausible to expect that scanning and monitoring efforts will be more fruitful when senior members of these scouting teams are representative of diverse forms of expertise (Bluedorn, Johnson, Cartwright, & Barringer, 1994; Tushman & O'Reilly, 1997; West, 2002). A variety of studies (i.e., Georgsdottir & Getz, 2004) have shown the extent to which multiple perspectives and knowledge sharing stimulate creative thought needed for the establishment of exploratory efforts. In keeping with this line of thought, mangers actively involved in the internal scanning and monitoring of their organizational environments will often come across problems that may act as a stimulus for innovation (Nystrom, 1979). These problems may serve as a springboard for future innovative efforts and supply the means for identifying interrelationships among issues that lead to enhanced organizational innovation. Given the nature of the problematic issues and multiple themes, organizations may also benefit from senior manages being close to the development process (Jelinek & Schoonhoven, 1990). It also goes without mention that organizations who are actively involved in scanning and monitoring of internal and external environments are also devoting an extensive amount of time and effort to their internal research and development departments. Hence, merely the existence of a research and development department has been shown to enhance organizational performance (Peeters & van Pottelsberghe de la Potterie, 2006; Sharma, 1999).

Themes and Exploration

Given the organization has gone through extensive scanning and monitoring of their internal and external environments, it is likely that several themes will have emerged considered to be worthwhile of resource investment. The organization is now faced with the decision as to which themes should be pursued and how they will manage the project as it unfolds. When faced with several options, it may quickly become an overwhelming task of deciding the number, nature, and mix of ideas to pursue. One line of thought suggests that focusing on a single theme based on a specific technology will tend to place an organization at excessive risk (Cooper, 2000; Kamoche & Cunha, 2001). However, organizations stretching their focus on too many themes can prove to be expensive and taxing on organizational resources (Nohari & Gulatti, 1996). Hence, if organizations can only focus on a restricted number of themes, the question now becomes which themes to pursue. Research has suggested that organizations pursue themes that 1) fit with existing operations, 2) meet their customer's demands 3) use multiple organizational competencies, 4) are consistent with current markets, 5) well formulated where development seems feasible, and 6) can be protected from imitation (Dougherty & Heller, 1994; Mumford, Bedell, & Hunter, 2008; Sharma, 1999).

Once the organization has decided upon a relevant number and mix of themes to pursue, it is now possible to move into a more exploratory phase where they can test their assumptions. It is within these exploratory efforts where developmental parameters are explored, requisite expertise is acquired, and potential is discovered. Research by Keegan and Turner (2002) found that managers in companies where innovation is at a premium had multiple exploratory efforts going on at a time. This

multiple focus contributes to the possibility of projects being blended and expanded to define template projects (Mumford, Bedell, & Hunter, 2008). Innovative efforts are also very susceptible to problems given their complex and unchartered nature. Given this complicated network of issues that will inevitably come about, it is fair to say that organizations should not merely give up on an idea or project if an idea has not shown tremendous success from the get-go (Sharma, 1999). Rather, it would seem wiser, and potentially more profitable, for organizations to restructure failed attempts at innovation to get a better focus and to link the underlying connections between why the project failed and how to turn it around (Dougherty & Heller, 1994). However, there is a line at which organizations can put too much time and resources into restructuring a failed attempt at innovation (Miller & Friesen, 1984). These time consuming restructuring efforts directed at a failed attempt at innovation can cost the organization valuable resources and time towards project implementation.

Although there is value in initiating several exploratory efforts and making guided attempts at restructuring failed innovative efforts, management of these efforts can present several challenges. Due to the exploratory nature of these small projects, some of these initiatives may not garner the type of attention needed to get these projects off the ground. Hence, managers must stay close to these initial projects to act as an advocate for those projects that show promise of profitable results (Howell & Boies, 2004). And given the interconnectedness of the themes and exploratory projects, it has also been shown that managers assigned to oversee multiple innovative efforts leads to more innovation, and in turn more organizational success (Dougherty & Heller, 1994).

Fundamentals

Given the organization has scanned the external and internal environments and focused on a relevant set of themes, the organization must now frame those themes in terms of fundamentals, or broad conceptual problems, relevant to several current organizational operations (Hughes, 1989; Mumford, Bedell, & Hunter, 2008). Focusing on these types of fundamental issues is advantageous in many ways. First, focusing on multiple projects can increase the probability that spin-off efforts will ensue. Second, since fundamentals remain stable over time, organizations will be sufficiently placed to acquire new knowledge (Cohen & Levinthal, 1990). Third, these broad conceptual problems can be characterized in terms of emerging long-term trends that will give life to projects by way of trickling into future projects (Simon, 1993). Fourth, and finally, defining themes in terms of fundamentals gives way to the emergence of synergies between efforts that are consistent with external markets, products, and core competencies.

Innovative projects, or new ventures, tend to be more complex, ambiguous, and resource intensive (Culnan, 1983). Many scholars point to the fact that organizations are inept with regard to researching trends, and even more so at transforming ideas into new business ventures (Sharma, 1999). Therefore, it seems prudent to suggest that organizations should not only value innovation exploration, but should also devote significant resources, or groups, devoted to researching emerging trends that fit within the general context of their existing projects (Tushman, 1977). Devoting time and resources towards this research in acquiring knowledge about the themes they are pursuing creates a market for the new venture

that will lead to increased innovation (Cohen & Levinthal, 1990). One potential dilemma managers will face is how to release the product into market. The choice becomes whether to release a product in small quantities in order to minimize risk to investment, or release the product in large quantities to maximize the payoff from market success. Although there is support for both types of entry, releasing products in large quantities has a higher probability for success based on two general assumptions. First, a large scale launch supplies the volume customers are looking for, which in turn provides credibility for the new product (Sharma, 1999). The second reason large scale entries are more successful lies in the fact that organizations that commit to large scale investments have a smaller chance of giving up when the going gets tough. Whereas, small market entries may succumb to the pressures and prematurely withdraw from the market.

Evaluation

One of the more powerful influences on innovation is the evaluation criteria applied by the organization once the themes and fundamentals have been defined (Gailbraith, 1982). Evaluation refers to the standards and strategies organizations apply while assessing innovative efforts (Mumford, Bedell, Hunter, 2008). Research by Kitchell (1995) looked at the evaluation strategies applied by manufacturing firms and found that the standards applied had a distinct impact on the adoption of new processes. Even so, these evaluating creative efforts can be a very taxing process. Given the level of intricacy, plans in different stages of development cannot be evaluated on fixed set of standards (Cooper & Kleinschmidt, 2000). Furthermore, evaluating exploratory efforts on production of financial criteria generally tends to be

ineffective. Rather, one should evaluate efforts in regards to the capacity for generation of template projects and the knowledge they may provide in regards to the fundamental themes being explored (Mumford, Bedell, and Hunter, 2008). Along similar lines, evaluation in terms of issue resolution and development of knowledge about the themes being explored are more fruitful when geared towards market potential, resource requirements, and timeframes.

Flexibility in regards to different stages of plan development must also be considered. For example, evaluating a project on a strict go or no-go basis has been shown to be ineffective. Lonergan, Scott, and Mumford (2004) illustrated this point by asking undergraduates to evaluate advertising campaigns for a new product. Their results suggest that the best campaigns evolved from compensatory revision strategies. Hence, project evaluation should go through multiple cycles of assessment and revision and framed more in terms of a developmental exercise, rather than in terms of specific goals (Basadur, Runco, & Vega, 2000, Mumford, Bedell, & Hunter, 2008).

Institutionalization of Innovation

Although scanning of the internal and external environment, selection of themes to pursue, and evaluation, institutionalization of innovation also appears to have a significant influence to organizational planning strategies. Institutionalization of innovation refers to the organizational policies, practices, and structures that contribute and/or support plan development and execution (Mumford, Bedell, Hunter, 2008). Various studies have linked an open oriented culture to innovation (Nystrom, 1990; Tesluk, Farr, & Klein, 1997). Along similar lines, horizontal organizational

structures have also been shown to be a critical factor to organizational innovation (Damanpour, 1991; Russell & Russell, 1992). This notion is supported due to horizontal structures ability to permit rapid movement of people across projects, in turn allowing the project to draw from multiple forms of expertise during project planning and development. When these multiple forms of expertise are given autonomy and a culture where intellectual engagement is possible, innovation and planning activities flourish (Mumford & Gustafson, 1988; Mumford, Shultz, & Osburn, 2002).

In addition to organizational structure, organizational controls also play an important role in innovation and planning (Abbey & Dickson, 1983; Cardinal, 2001). More specifically, rewarding innovation, providing autonomy in resolving project related issues, and providing a means to bring problems to the attention of senior management have also been found to be important to innovation (Mumford, Bedell, & Hunter, 2008). Moreover, innovative projects tend to be resource intensive activities and are benefitted from having necessary resources and the ability to adjust those resources based on project needs (Chandy & Tellis, 2000; Nohari & Gulatti, 1996). Hence, given intense resource requirements, it can be deduced that resource intensive projects will also benefit from a generous allotment of time during the initial exploratory and template planning activities (Amabile, Hadley, Kramer, 2002; Cardinal & Hatfield, 2000). Along different lines, Andriopoulos and Lowe (2000) found that development of requisite information technology systems also contribute to the planning efforts.

Group Level Influences

Mission Definition

One of the most integral influences on innovation is the nature of the mission, or set of goals, presented to the group. These goals provide the structure in which specific products are to be produced, giving way to a more focused approach to creativity (Mumford, Bedell, & Hunter, 2008). One illustration of this is in the Kidder (1981) study examining the development of the new mini computer. His study found that the effort was guided by a more straightforward goal of examining 32 bit chip processing capabilities.

This leads to an overall question of how mission definition serves to function during the planning phase of innovative projects. First, missions provide direction without placing constraints on how people explore mission pertinent issues (Trevelyan, 2001). Missions also provide a structure that allows multiple people to add autonomous contributions that seem to be crucial to creative projects (Mumford, Scott, Gaddis, & Strange, 2002). However, Mumford et al. (2008) also suggest that these missions are more beneficial when evidencing three key characteristics 1) relevant to the fundamental trends of the organization, 2) suitable scope, 3) appropriate configuration within project planning stages.

Perhaps one of the most important characteristics of a mission is that it be consistent with the overall trends and fundamentals sought by the organization. This allows the creative efforts to be put in context, assigns organizational meaning to the project, and provides a level of legitimacy to the effort. Providing this context allows people a way to make sense out of issues that arise as they cope with novel, ill-

defined tasks and any predicaments that may come about (Drazin, Glynn, & Kazanjian, 1999; Ford, 1996).

Given the previous discussion with regard to mission context, the scope of the mission should not be taken lightly. For example, mission statements should define what is expected of the group, but also explicitly define relevant restrictions on group activities (Kidder, 1981). This provides a means for the mission to be defined broadly, however, not too vague in which their value as a directive and integrative instrument are limited. Thus, mission definition requires a sort of balancing act with regards to breadth and specificity in terms of when the structure should broad or specific to provide the level of detail appropriate for the project stage (Mumford, Bedell, & Hunter, 2008).

Team Planning Processes

Planning processes during the various stages inevitably encounter various demands and unique influences that must be considered. First, the teams responsible for the planning efforts must frame plans around adequate resource and time requirements (Amabile, Hadley, & Kramer, 2002; Ekvall & Ryhammer, 1999; Nohari & Gulati, 1996). Therefore, to eliminate some of the repercussions coming from inadequate resource allocation, key components of the endeavor must be specified (Mumford, Bedell, & Hunter, 2008). Even so, research by Dailey & Mumford (2006) has shown that people's time and resource estimates tend to be inaccurate and overly optimistic, especially given ambiguous conditions (Licuanan, Dailey, & Mumford, 2007). Hence, this suggests mission planning teams should apply devil's advocate techniques and maintain some level of slack resources when allocating time and

resources to planning efforts. Moreover, the group must also be negotiating these time and resource requirements in a cooperative manner (Mumford, Bedell, & Hunter, 2008).

These observations lead to a broader point in that project planning is a continuous activity that requires refinement and adjustment as the project unfolds. Therefore, the group must have a series of plans, not merely one (Mumford, Bedell, & Hunter, 2008). Additionally, in order for the group to know when they need to make adjustments, they must also monitor progress markers along the way. This process can be tedious and get unorganized if too many players are involved in the readjustment and refinement. Therefore, it is suggested that a group of key players representing different portions of the plan be involved in the adjustment and reallocation activities (Curral, Forrester, Dawson, & West, 2001). One central way to do this is to have team leader meetings to discuss issues and potential resolutions.

Like teamwork in general, project planning teamwork requires a commitment to the effort and a clear goal of where they are going. Mumford et al. (2008) suggests that innovation is more likely to occur when 1) group members have shared mental models, 2) critical issues and/or potential problems are brought to attention in meetings or daily interactions to provide a way for backup activities, and 3) criteria are established for monitoring team performance and project outcomes.

Relationship Formation

One phenomenon that has not been discussed that may have a powerful influence on planning is requisite relationships. As the complexity of innovative efforts increases, exchange and collaboration between organizations working within a

broader network may be necessary (Mitra, 2000). These alliances provide additional capabilities such as information about customers, suppliers, and competitors (Adams & Day, 1998; Nellore & Bacachandra, 2001), and necessary technical support (Hargadon & Sutton, 1997). Similarly, planning efforts may also benefit from involving other intra-organizational groups in their planning efforts.

Given the involvement of multiple internal and external partners, planning efforts may benefit from structuring the relationships among sub-teams and collaborating with people that have complementary forms of expertise (Abra, 1994; Gassman & van Zedwitz, 2003; Mumford, Bedell, & Hunter, 2008). There are several ways requisite relationships may be formed. For example, groups may recruit members with multiple network connections, needed skills, or members that provide contradictory views as a way to balance out other group members (Alam, 2003; Mumford, Bedell, & Hunter, 2008). Therefore, careful consideration and definition of roles and expectations during different stages becomes even more crucial. Finally, given the mixture of expertise between internal and external members, recognizing collaborative and individual contributions with rewards, compensation, or recognition may also serve to enhance the project.

Planning and Financial Performance

Successful organizations depend on thoughtful planning in order to maintain their competitive advantage. As described in the planning model presented by Mumford and his colleagues, planning can be a demanding and resource-intensive process. Hence, it is likely that not every organization will be willing to undergo such an investment (Mumford, Shultz, Osburn, 2002), however critical. Baier, Hartmann,

and Moser (2008) evaluated the strategic alignment and purchasing planning strategies of 141 strategic business units with revenues over US $3 billion. Their results suggest that carefully considered strategic direction, prioritization towards greatest value to the business unit, and involvement of the Chief Purchasing Officer (CPO) in the strategic planning decisions lead to increased financial performance. Along similar lines, research by Tegarden et al. (2005) suggests that employee engagement in strategy processes can be related to financial performance. Hence, the following hypothesis:

Hypothesis 1: Planning strategies have a significant impact on financial performance.

Planning and Innovation

Continuous changes in technology, competitive pressures, and consumer expectations have acted together to put an increased focus on the importance of innovation (Florida, 2002, Halbesleben, Novicevi, Harvey & Buckley, 2003). Innovation in its simplest form is conceived of as the development and implementation of novel ideas (Mumford and Gustafson, 1988). Technology based organizations live and die by the development and implementation of these new approaches. Research by Eisenhardt and Tabrizi (1995) looked at the planning processes involved with the development of new products in the computer industry. They found that increased product development time was related to upfront planning, whereas use of multifunctional teams decreased product development time. Along similar lines, Robinson and Pearce (1988) examined planning processes used across research and development, brand, service and efficiency strategies. Their research

suggests that the performance of firms depends on the quality of the planning processes implemented. This is sufficient evidence supporting the notion that planning is a vital component to the success of innovative organizations. Hence, the following hypothesis:

Hypothesis 2: Planning strategies have a significant impact on innovative performance.

An additional question that needs to be addressed is the importance of planning strategies in companies that differ in regards to financial and innovative success. Given the relationship between financial performance and innovative practices (Low, Chapman, and Sloan, 2007), one can assume that planning strategies differ in regards to high financial and innovative success companies versus companies that experience less success. Hence, the following hypothesis:

Hypothesis 3: Planning strategies will differ in regards to financial and innovative success.

Method

Sample

The sample used in this study included 119 technology-based organizations (see Figure 1). A technology-based organization was defined as an organization that used science, knowledge, tools, and/or systems to increase or promote well-being. Industries meeting these criteria were selected from a Hoover's search engine that produced a list of companies meeting these criteria. Companies from this list were selected based on three criteria: 1) size of the company, 2) level of success, and 3)

level of innovation. Size of the organization was defined as the number of employees obtained by the company. This variable was dichotomized as either small (under 10,000 employees) or large (over 10,000 employees). Level of success was defined as the average revenue, plus the average gross profit over a three year period from 2003-2005. This variable had three levels as either low (.5 million-2.5 billion), moderate (2.5-5 billion), or high (above 5 billion). Companies fitting these requirements were retained and their websites were then viewed to ensure they spoke of innovation in at least two separate locations/frames. Companies whose websites did not meet these criteria were eliminated from the sample. At this juncture, material selection, as described below, was carried out. These selected materials were then assessed upon the third criterion, level of innovation. Level of innovation was defined as the number of innovative words divided by the total number of words contained in the documents, and was dichotomized as either low or high. A set of innovative words was used as a guide during this process and can be found in Figure 2. In order to determine level of innovation, 120 company's materials were selected for each of the six categories (small/low success, small/medium success, small/high success, large/low success, large/medium success, and large/high success). Word counts for each company in the six categories were averaged to produce an average word count for each category. From here, an average of the 6 categories was calculated producing an average word count (i.e. number of innovative words divided by number of total words) of .015 across the six categories. This was used to define low vs. high innovation. Thus, company websites, and material selection, was continued until 10 companies were identified for each of the six categories that were low in innovation

and 10 companies that were high in innovation. The final sample included 10 companies for 11 of the 12 cells, where one cell had 9 companies (i.e., small size/low success/low innovation), or 119 companies total.

Materials

Material used to evaluate each company was taken directly from the company's personal website. D'Angelo and Little (1998) define a website as a set of web pages, or electronic documents, that are meaningfully linked together. In addition to meeting the sample criteria mentioned previously, the website must have been able to produce at least three viable documents. A document was defined as a web page with up to five hyperlinks. Hyperlinks were included as part of the document given the supportive research suggesting them as being a continuation of the web page (D'Angelo & Little, 1998; Felker, 2002). In the instance where a web page referred to segments that had links to each of the segments, all segment links were included as part of the document. These document criteria were put in place to standardize data collection and provide the most accurate company description, capture the most planning information, and to ensure each document was as objective as possible. Examples of potential documents include the company's mission and values statement, company culture description, company structure outline, vision statement, etc.

In keeping with this line of thought, a two-tier document selection process was implemented to ensure the material for each company contained the most planning information and required the least amount of inference on part of the reader. First, 3-7 documents were identified that provided the most variable and marker information.

These documents must have contained at least one planning variable with two or more markers to be included in this first tier. Second, the first tier documents were analyzed for objectivity or amount of inference required on part of the reader. Thus, after the documents were selected based on amount of planning information contained in them, 3-5 documents were retained that had the most objective information. Based on this two-tier selection process, 3-5 final documents were selected for each company that had the most amount of planning information and required the least amount of inference on the part of the reader.

Covariates

The covariate measures in this study were used to control for the company's market turbulence, competitive intensity, and technological turbulence. Market turbulence refers to the extent to which the composition and preferences of the organization's customers tended to change over time (Jaworski & Kohli, 1993). These items consisted of 1) In our kind of business, customers, product preferences change quite a bit over time, 2) Our customers tend to look for new product all the time, 3) We are witnessing demand for our products and services from customers who never bought them before, 4) New customers tend to have product-related needs that are different from those of our existing customers, 5) We cater to many of the same customers that we used to in the past. The full-scale reliability estimate of .64 was reached for market turbulence, demonstrating adequate reliability for the research purposes at hand.

The second covariate measured competitive intensity based on six items. Competitive intensity measures the behaviors, resources, and ability of competitors to

differentiate. These items consisted of 1) Competition in our industry is cutthroat, 2) There are many promotion wars in our industry 3) Anything that one competitor can offer, others can match readily 4) Price competition is a hallmark of our industry 5) One hears of a new competitive move almost every day, 6) Our competitors are relatively weak. A full-scale reliability estimate of .61 was reached, evidencing adequate reliability for the research purposes at hand.

The third and final, environmental control pertained to technological turbulence. This variable refers to the extent to which technology in the industry is changing rapidly (Jaworski & Kohli, 1993). This scale was assessed using 5 items: 1) The technology in our industry is changing rapidly, 2) Technological changes provide big opportunities in or industry, 3) It is very difficult to forecast where the technology in our industry will be in the next 2-3 years, 4) A large number of new product ideas have been made possible through technological breakthroughs in our industry, 5) Technological developments in our industry are rather minor. Originally, the scale developers dropped the 3rd marker; however it was left in for the current research purposes. For this research study, a full-scale reliability estimate of .60 was reached using the 5 items. This evidenced adequate reliability for the research purposes at hand.

Planning Variables (Independent Variables)

This study looked at eight planning variables: 1) Scanning and Monitoring, 2) Themes and Exploration, 3) Fundamentals, 4) Evaluation, 5) Institutionalization of Innovation, 6) Mission Definition, 7) Team Planning Processes, and 8) Relationship Formation. Each planning variable had a set of markers that characterized the

planning variable of interest. After the materials were selected for each company, four raters were assembled to code each document on the presence of the individual markers. These markers were drawn from the literature reviewed earlier. Figure 3 lists these markers and the planning variables they represent.

The raters consisted of four Ph.D. candidates in industrial organizational psychology that were familiar with innovation research. Each rater participated in a training program in order to maximize interrater reliability. Initial rater training meetings included examples of planning variables and their associated markers. After planning variables and markers were discussed, each rater judged a sample of website content evidencing each of the variables under consideration. After these ratings had been made, raters reconvened to discuss their judgments. Once an acceptable coefficient had been reached, each rater proceeded with coding task. The resulting percent agreement ranged from .71 to .97, with an average of .83 (See Table 1).

As noted previously, raters coded each document for the presence of markers for each planning variable. A marker was defined as present if two or more raters coded the marker as present in the document. The presence of markers then was totaled across all of the company's documents for a total presence indicator for each marker. Finally, marker totals were summed across the planning variable to indicate a total score for each planning variable. Therefore, each company had a total score for the eight planning variables under consideration.

Dependent Variables

There were two sets of dependent variables assessed in this study. The first set included the following financial criteria: 1) average gross profit from 2005-2006, 2)

average net income from 2005-2006, and 3) average return on investment from 2005-2006. These figures were obtained from the organizations' financial statements. The second set of dependent variables pertained to innovation criteria. The first dependent variable for innovation was the number of patents from 2005-2006 for each organization. This information was obtained from the United States Patent and Trademark search engine, which can be found at www.uspto.gov. The second innovative dependent variable pertained to the number of innovative words from the organization's selected materials. Word count was operationalized as the total number of innovative words contained in the documents, divided by the number of total words.

Analyses

The dependent variables examined in the first set of analyses were average gross profit from 2005-2006, average net income from 2005-2006, average return on investment from 2005-2006, number of patents from 2005-2006, and the number of innovative words contained in the organization's website content. A series of five hierarchical linear regressions were conducted where planning variables were treated as independent variables and environmental variables treated as covariates.

The second set of analyses examined whether the type of organization moderated planning strategy use. A stepwise discriminant function analysis was conducted to identify the differences in use of planning strategies between types of companies where the covariates and planning variables were used as independent variables and type of organization was the grouping variable. The type of organization was categorized by creating overall innovation and financial categories.

The innovation category was created by adding the standardized scores for number of patents from 2005-2006 and number of innovative words in the company's documents. Similarly, the financial category was created by combining the standardized scores for average gross profit from 2005-2006, average net income from 2005-2006, and average return on investment from 2005-2006. These two categories were dichotomized into high vs. low innovation and high vs. low financial success, creating four groups of companies (high innovation/high financial, low innovation/high financial, high innovation/low financial, low innovation/low financial). These four groups of companies served as the groups being distinguished, in which the planning strategies and environmental controls served as the distinguishers.

Results

A series of hierarchical multiple regressions were performed to assess the influence of the eight planning strategies and three controls on average gross profit, average net income, average return on investment, patent count, and number of innovative words. Table 2 illustrates the results from the average gross profit hierarchical regression. This analysis revealed that competitive intensity entered into Step 1, explaining 5.9% of the variance in average gross profit. Institutionalization of innovation entered into Step 2 and explained an additional 12.7% of the variance, after controlling for competitive intensity, R squared change = .13, F change (1, 116) = 18.11, $p < .001$. Relationship formation entered into Step 3 and explained an additional 2.9% of the variance revealing the total variance explained by the model as a whole at 21.4%, F (3, 115) = 10.47, $p < .001$. In the final model, competitive

intensity, institutionalization of innovation, and relationship formation were significant, with institutionalization of innovation recording a higher beta value (beta = .44, $p < .001$) than competitive intensity (beta = .19, $p < .05$), and relationship formation (beta = -.19, $p < .05$). These results indicate that as average gross profit increases companies use more institutionalization of innovation planning processes, but less relationship formation planning processes, and have higher levels of competitive intensity.

Table 3 displays the results from the average net income hierarchical regression. These results revealed that institutionalization of innovation entered into Step 1, explained 14% of the variance in net income. After entry of relationship formation in Step 2 the total variance explained by the model as a whole was 18.3%, $F (2, 116) = 12.97$, $p < .001$. Relationship formation explained an additional 4.3% of the variance in average net income, after controlling for institutionalization of innovation, R squared change = .04, F change $(1, 116) = 6.1$, $p < .05$. In the final model institutionalization of innovation and relationship formation were significant, with institutionalization of innovation recording a higher beta value (beta = .47, $p < .001$) than relationship formation (beta = -.23, $p < .05$). These results indicate that as average net income increases, companies use more institutionalization of innovation planning practices and less relationship formation planning processes.

The results from the return on investment hierarchical regression are represented in Table 4. As illustrated, technological turbulence as the only variable entered into the model, explaining 4.7% of the total model variance, $F (1, 117) = 5.79$, $p < .05$. In this model, technological turbulence recorded a negative beta value (beta = -.22, p <

.005) indicating that as average return on investment increases companies experience lower levels of technological turbulence.

Results from the patent count hierarchical regression are shown in Table 5. These indicate that technological turbulence entered into Step 1, explained 11.3% of the variance in patent count. Institutionalization of innovation entered in Step 2 explained an additional 14.8% of the variance, after controlling for technological turbulence, R squared change = .15, F change (1, 116) = 23.19, $p < .001$. Relationship formation entered into Step 3 explained an additional 2.7% of the variance revealing the total variance explained by the model as a whole at 28.8%, F (3, 115) = 15.53, $p < .001$. In the final model, technological turbulence, institutionalization of innovation, and relationship formation were statistically significant, with institutionalization of innovation recording a higher beta value (beta = .46, $p < .001$) than technological turbulence (beta = .32, $p < .001$) and relationship formation (beta = -.18, $p < .05$). These results indicate that as patent count increases companies use more institutionalization of innovation, but less relationship formation planning processes and have higher levels of technological turbulence.

Table 6 represents the results from the innovative word count hierarchical regression, revealing that mission definition entered into Step 1, explained 19.8% of the variance in innovative word count. Team planning processes entered in Step 2 explained an additional 3.4% of the variance, after controlling for mission definition, R squared change = .03, F change (1, 116) = 5.11, $p < .05$. Relationship formation entered into Step 3 explained an additional 3.7% of the variance revealing the total variance explained by the model as a whole at 26.9%, F (3, 115) = 14.1, $p < .001$. In

the final model, mission definition, team planning processes, and relationship formation were significant, with mission definition recording a higher beta value (beta = .42, $p < .001$) than team planning processes (beta = -.22, $p < .01$) or relationship formation (beta = .21, $p < .05$). These results indicate that as innovative word count increases, companies use more mission definition and relationship formation planning practices, but less team planning processes.

In addition to the hierarchical regressions, a stepwise discriminant function analysis was performed using the eight planning variables and three controls as predictors. These results can be found in Table 7. The groups being differentiated were classified as being high vs. low in financial and innovative success, producing four groups (i.e., high financial success/high innovation, high financial success/low innovation, low financial success/high innovation, and low financial success/low innovation). A solution was reached in one step, Wilk's Lambda = .83, X^2 (3) = 21.94, $p < .001$, with one significant function. Specifically, the loadings or structure coefficients for the function were as follows: a) institutionalization of innovation (r = 1), b) fundamentals (r = .47), c) scanning and monitoring (r = .46), d) relationship formation (r = .38), e) mission definition (r = .32), f) themes and exploration (r = .24), g) evaluation (r = .24), h) team planning processes (r = .21), i) competitive intensity (r = .11), j) technological turbulence (r = .02), k) market turbulence (r = -.01). Results from this analysis revealed that institutionalization of innovation was used more by company's that were high in financial and innovative success, versus the other three groups (i.e., high financial success/low innovation, low financial success/high innovation, low financial success/low innovation).

Discussion

These findings are the first of its kind supporting the planning model presented by Mumford et al. (2008). Results such as these have several implications; however, certain limitations are noteworthy and need to be taken under consideration when interpreting the findings. To begin, this study was based on historic data, which by definition depends on existing information that has been selected based on given criteria (Mumford, 2006; Simonton, 1990). Historic data is often preferred in research dealing with hard, or objective, data (e.g., financial information) given its ability to provide credence to the reliability of measures and the validity of ensuing inferences (Mumford, 2006; Tyler, 1964). However, historiometric research does not come without its caveats. One of those caveats is the accuracy and consistency of the data presented. For example, the financial dependent variables were taken from the company's financial statements. Although financial reporting is monitored and subjected to regulations, financial statements are subject to embellishment and may shed a more positive light on the company. Additionally, financial statements can be reclassified periodically, providing a different view of the company's financials.

Along related lines, historic documents, especially websites, vary in quality and are prone to certain interpretive and reporting biases. Given this limitation, criteria were implemented to standardize the data collection procedures and behavioral markers were identified for the planning variables to reduce this bias (Mumford, 2006). However, complete representation of the company's planning strategies may not be possible. Therefore, other planning strategies may have been implemented, but were ruled out due to the selection processes applied. This is a new

realm of data collection that needs to be researched further to identify other ways of collecting website content.

The use of innovative word count is similarly prone to a certain level of subjectivity. Considerable effort was made to standardize the coding process by using an extensive set of innovative words as a guide during the process. Given the nature of the English language, this list was not intended to be an exhaustive list. Rather, this list was used as a guide as a means to standardize the coding process (Mumford, 2006). This method served to collect a wider range of innovative words, without excluding innovative words that were not originally thought of, given that an all encompassing list has yet to be researched or developed. Hence, a certain level of interpretation and coding errors are possible in such an arduous process. However, innovative word count is a new approach to collecting innovative outcome criteria. Future research may benefit from expanding this field to develop a comprehensive list of innovative words. Furthermore, future research may also benefit from using word count software or computerized content analysis to better the reliability and stability of the results (Morris, 1994).

Finally, company patent information was taken from the United States patent search engine using Boolean search terms. Although this was consistent across all companies and a vested effort was made to capture all related patents, search engines are naturally prone to user and system errors (Frants, Shapiro, Taska, Voiskunskii, 1999). Research supports using Boolean terms when searching large bodies of data (Radecki, 1982), although future research may benefit from gathering patent

information from the company itself, still this collection method also poses self-report method bias.

Even bearing these caveats in mind, the present study has several significant implications for the planning practices of technology-based organizations. First, the results indicate that planning strategies do have a marked impact on financial and innovative success. More specifically, financial success seems to rely on institutionalization of innovation planning processes in general, and can be influenced by competitive intensity and technological turbulence levels. This suggests that organizations that have organizational structures, practices, and policies in place that contribute to, or support, the development and execution of plans for innovative projects tend to have more financial success (i.e., higher gross profit and net income).

Second, institutionalization of innovation also seems to be relevant to patent productivity, which gives more credibility to the notion that financial and innovative successes are somewhat intertwined (Low, Chapman, and Sloan, 2007). This proposition is also supported by the discriminant function results, suggesting that organizations that are high in financial and innovative success also use more institutionalization of innovation planning processes. These results indicate that companies looking to increase their success, both financially and innovatively, should focus more on practices and structures that support the development of innovative projects (e.g., recognize and reward innovation, encourage professional engagement, adopt and open achievement oriented culture to innovation, divide project work into functional areas). Additionally, these results also suggest that good financial planning contributes to innovation planning and vice-versa.

Finally, innovative word count use on organizational websites seems to be related to mission definition and relationship formation planning strategies. One possible explanation for this is the way organizations describe their group planning strategies on their website. As it seems, organizations that devote more website space to describing group planning processes (i.e., mission definition and relationship formation) also tend to have more innovative word use. This could be a function of the website content focused on by the organization. Moreover, it may be easier to describe group and planning processes within the organization in a more innovative format due to the consistent changing nature of technological companies (Dean & Sharfman, 1996). Future research should investigate how organizations depict their companies and describe their group processes. These results can provide a pathway for improving the organizations ability to communicate their group planning processes and how they may be related to innovation and financial success.

This research delved into several new approaches of investigating organizational planning practices of technology-based organizations. More specifically, website content was collected and analyzed to decipher the planning practices that were in play. Given that this is a novel approach to innovation planning research, more research is needed to substantiate these findings further. No two websites are identical; therefore, future research should include discovering other ways of standardizing website document collection. In addition to website document collection, innovative word count was another new approach implemented in order to collect innovative outcome criteria. Using this research as a sounding board, future studies should identify other forms of innovative outcome criteria such as amount of

money devoted to research and development, number of scientists on board, number of research faculty, etc. This research study is a starting ground for formulating other forms of research on how companies plan to be more innovative, therefore more financially successful in return.

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Table 1: Aggregated Planning Variable Percent Agreements

	Percent Agreement
Scanning and Monitoring	79%
Themes and Exploration	77%
Fundamentals	71%
Evaluation	81%
Institutionalization of Innovation	79%
Mission Definition	84%
Team Planning Processes	97%
Relationship Formation	94%

Table 2: Average Gross Profit Regression Results

	Avg Gross Profit			
	β	ΔR^2	R^2 (*Adj*.R^2)	ΔF
Block 1				
Competitive Intensity (Step 1)	0.19*	0.06	0.06 (0.05)	7.32
Block 2				
Institutionalization of Innovation (Step 2)	0.44***	0.13	0.19 (0.17)	18.11
Relationship Formation (Step 3)	-0.19*	0.03	0.21 (0.19)	4.18

* p < .05, ** p < .01, *** p < .001

Table 3: Average Net Income Regression Results

	Avg Gross Profit			
	β	ΔR^2	R^2 (*Adj*.R^2)	ΔF
Block 2				
Institutionalization of Innovation (Step 1)	0.47***	0.14	0.14 (0.13)	19.02
Relationship Formation (Step 2)	-0.23*	0.04	0.18 (0.17)	6.1

* p < .05, ** p < .01, *** p < .001

Table 4: Average ROI Regression Results

	Avg Gross Profit			
	β	ΔR^2	R^2 (*Adj*.R^2)	ΔF
Block 1				
Technological Turbulence	-0.22*	-	0.05 (0.04)	5.79

* p < .05, ** p < .01, *** p < .001

Table 5: Innovative Word Count Regression Results

	Avg Gross Profit			
	β	ΔR^2	R^2 (*Adj*.R^2)	ΔF
Block 2				
Mission Definition (Step 1)	0.42***	0.2	0.2 (0.19)	28.85
Team Planning Processes (Step 2)	-0.22**	0.03	0.23 (0.22)	5.11
Relationship Formation (Step 3)	0.21*	0.04	0.27 (0.25)	5.87

* p < .05, ** p < .01, *** p < .001

Table 6: Patent Regression Results

	Avg Gross Profit			
	β	ΔR^2	R^2 (*Adj*.R^2)	ΔF
Block 1				
Technological Turbulence (Step 1)	0.32***	0.11	0.11 (0.11)	14.97
Block 2				
Institutionalization of Innovation (Step 2)	0.46***	0.15	0.26 (0.25)	23.19
Relationship Formation (Step 3)	-0.18*	0.03	0.29 (0.27)	4.38

* p < .05, ** p < .01, *** p < .001

Table 7: Discriminant Structure Matrix and Group Centroids

Structure Matrix		Group Centroids	
Institutionalization of Innovation	1	Group 1	-0.45
Fundamentals	0.47	Group 2	-0.21
Scanning and Monitoring	0.46	Group 3	-0.1
Relationship Formation	0.38	Group 4	0.71
Mission Definition	0.32		
Themes and Exploration	0.24		
Evaluation	0.24		
Team Planning Processes	0.21		
Competitive Intensity	0.11		
Technological Turbulence	0.02		
Market Turbulence	-0.01		

Note: Canonical Correlation = .416; X2 (3) = 21.94, p <.001; Group 1 = Low Financial success/Low Innovative success, Group 2 = Low Financial success/High Innovative success, Group 3 = High Financial success/Low Innovative success, Group 4 = High Financial success/High Innovative success

Table 8: Correlations

	SM	TE	F	E	II	MD	TPP	RF	Avg GP	Avg NI	Avg ROI	WC	P	MT	CI	TT
SM	-	.41 **	.56**	.56**	.50**	.31**	.18*	.27**	0.16	0.12	.19*	0.15	0.13	-0.06	-0.07	-0.06
TE	-	-	.67**	.20*	.30**	.33**	0.06	.33**	0.08	0.04	0.11	.23*	0.1	0.09	-0.06	0
F	-	-	-	.34**	.50**	.29**	0.01	.27**	0.1	0.08	0.11	0.16	0.11	0.02	-0.01	0.06
E	-	-	-	-	.26**	.21*	0.14	0.14	0.17	0.16	0.08	0.11	0.15	-0.1	-0.09	-0.05
II	-	-	-	-	-	.42**	.19*	.43**	.39**	.37**	0.14	.26**	.41**	-0.01	0.15	0.09
MD	-	-	-	-	-	-	.25**	.38**	0.16	0.09	0.12	.45**	0.03	-0.14	0.04	-.21*
TPP	-	-	-	-	-	-	-	.23*	.19*	-0.07	0.04	-0.07	0	-0.07	0.11	-0.15
RF	-	-	-	-	-	-	-	-	0.02	-0.03	0.03	.32**	0.05	0.1	0.06	0.1
Avg GP	-	-	-	-	-	-	-	-	-	.81**	0.06	0.02	.71**	0.1	.24**	0.17
Avg NI	-	-	-	-	-	-	-	-	-	-	0.07	0.04	.65**	0	0.15	0.08
Avg ROI	-	-	-	-	-	-	-	-	-	-	-	0.08	0.03	-0.08	-.22*	-.22*
WC	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-0.02	-0.05	0.02
P	-	-	-	-	-	-	-	-	-	-	-	-	-	.23*	.24**	.34**
MT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.42**	.50**
CI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.36**
TT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: SM = Scanning and Monitoring, TE = Themes and Exploration, F = Fundamentals, E = Evaluation, II = Institutionalization of Innovation, MD = Mission Definition, TPP = Team Planning Processes, RF = Relationship Formation, Avg GP = Average Gross Profit, Avg NI = Average Net Income, Avg ROI = Average Return on Investment, WC = Innovative Word Count, P = Patents, MT = Market Turbulence, CI = Competitive Intensity, TT = Technological Turbulence; * $p < .05$, ** $p < .01$.

Figure 1: Technology-based Companies

Small/Low Success/Low Innovation
All American Semiconductor Inc
1mage Software Inc
01 Communique Laboratory
Olin Corporation
Telos Corporation
Kyphon Inc
Zebra Technologies Corp
5G Wireless Communications Inc
Otter Tail Corporation
Linear Technology Corporation

Small/Low Success/High Innovation
Imation Corp
3D Systems Corporation
Lam Research Corporation
International Rectifier Corporation
Ceradyne Inc
Sigma Designs Inc
Trimble Navigation Limited
Daktronics Inc
Omnivision Technologies Inc
Celgene Corporation

Small/Medium Success/Low Innovation
Bell Microproducts Inc
Agricore United
Agrium Inc
Alfa Laval AB
United Agri Products Inc
Celanese Corporation
Zimmer Holdings Inc
Nippon Electric Glass Co Ltd
NGK Insulators Ltd
Jenoptik AG

Small/Medium Success/High Innovation
Ryosan Company Limited
Merck Serono SA
Broadcom Corporation
Biogen Idec Inc
Namco Bandai Holdings Inc
Nvidia Corporation
Engelhard Corporation
Hercules Inc
Cabot Corporation
Gilead Sciences Inc

Small/High Success/Low Innovation
RTL Group SA
Softbank Corp
Tupras
Tamro Corporation
Hellenic Petroleum SA
Fujitsu-Siemens Computers (Holding) BV
Equistar Chemicals LP
Avnet Inc
Acer Inc
Union Carbide Corporation

Small/High Success/High Innovation
Yara International ASA
Nagase & Co Ltd
Tokyo Electron Limited
Total Petrochemicals
Tokyo Gas Co Ltd
Johnson Matthey PLC
Imperial Oil Limited
Hitachi America Ltd
Genentech Inc
Borealis AG

Figure 1: Continued

Large/Low Success/Low Innovation
Technitrol Inc
KSB AG
Kingboard Chemical Holdings Limited
Silicon Precision Industries Co Ltd
Prosegur Compania de Securidad SA
CDI Corp
Johnson Electric Holdings Limited
Amdocs Limited
Mitsumi Electric Co Ltd
Fidelity National Information Services

Large/Low Success/High Innovation
CACI International Inc
Pall Corporation
Singapore Technologies Engineering Ltd
Vtech Holdings Limited
Stats ChipPac Ltd
Villeroy and Boch AG
ON Semiconductor Corp
Multi-Fineline Elextronix Inc
Mabuchi Motor Co Ltd
Alco Holdings Limited

Large/Medium Success/Low Innovation
Advanced Semiconductor Engineering Inc
Teleflex Incorporated
Oce NV
Zodiac SA
Cookson Group plc
Diebold Incorporated
Wartsila Corporation
Symbion Health Limited
Saab AB
Tokai Rika Co Ltd

Large/Medium Success/High Innovation
Essilor International SA
Fujikura Ltd
Rohm Company Limited
IMI plc
Energizer Holdings Inc
Hitachi Cable Ltd
BBA Group
Nippon Sheet Glass Company Limited
Bausch and Lomb Incorporated
Beckman Coulter Inc

Large/High Success/Low Innovation
Jacobs Engineering Group Inc
Lexmark International Inc
Ingram Micro Inc
EMC Corporation
Infineon Technologies AG
Panasonic Corporation
Mitsui and Co Ltd
Sony Corporation
Texas Instruments Incorporated

Large/High Success/High Innovation
Micron Technology Inc
Ball Corporation
Ikon Office Solutions Inc
Advanced Micro Devices Inc
Seagate Technology
Rohm and Hass Company
International Business Machines Corp
United Technologies Corporation
The Dow Chemical Company
Sun Microsystems Inc.

Figure 2: Innovative Word Reference List
Innovation, inventive, original, creative, novel, new, unique, unusual, ground-breaking, modern, pioneering, revolutionary, imaginative, inspired, artistic, resourceful, ingenious, productive, clever, nifty, neat, radical, avant-garde, world-shattering, crazy, surprising, special, shocking, unexpected, unanticipated, unforeseen, amazing, leading-edge, pioneered, imagination, experiments, revolutionizing, first, next-generation, risky, pioneer, research and development, R&D, invent, fresh-thinking, forward-looking, patent and copyright symbols

Figure 3: Planning Variables and Markers	
Planning Variable Definition	**Planning Variable Markers**
Scanning and Monitoring	
Scanning and Monitoring refers to the scanning and analysis of the environment external to the organization as well as monitoring of the organization's internal environment with regard to current innovation efforts	Does the organization gather customer feedback
	Does the organization gather supplier feedback
	Does the organization conducting market research
	Does the organization monitor competitors
	Does the organization monitor technology
	Does the organization monitor internal processes
	Does org scanning cover a large range and diversity of topics
	Does the org. communicate with atypical contacts searching for info
	Does the organization have diverse scouting teams (i.e., teams looking form diverse topics)
	Does the organization view problems as opportunities to learn
	Are senior managers close to the innovation development process
	Does the organization have an R&D department
Themes and Exploration	
Themes and exploration refers to what themes and exploratory efforts the organization is interested in pursuing and how these efforts should be managed	Does the org pursue an extremely large or small amount of themes
	Does the org have multiple exploratory efforts going on at a time
	Does the organization pursue a mixture of themes
	Are themes the org is pursuing consistent with current markets
	Are the themes pursued consistent with existing operations
	Do the themes being pursued cover cross-organizational issues
	Does the org integrate departments when exploring new products
	Does the org assign 1 manager to oversee multiple innovative efforts
	Does the supervisor manage which projects are being explored
	Does the organization restructure failed attempts at innovation
	Does the organization spend a lot of time restructuring failed efforts
	Does the org work closely w/customers when exploring new products
	Does the org evaluate projects when initially exploring options
	Are themes the organization is pursuing feasible
	Are the themes being pursued cost efficient
	Are the products being pursued protected from imitation

Figure 3: Continued	
Fundamentals	
Fundamentals refer to the core types of ideas the organization pursues. In other words, they are the type of common themes that are pursued by the organization that may be useful in multiple organizational arenas	Does the organization assign systematic groups to look at trends
	Does the org pursue themes/projects that can be defined in terms of emerging long-term trends
	Do the products sought have common values
	Does the org spend a large amount of time gathering knowledge about the project
	Do organizational values lead to the acquisition of new knowledge
	Does the org have groups devoted to acquiring knowledge about themes
	Are product options stable
	Does the organization release the product in mass quantities
	Do the organizational values restrict innovation exploration
	Do the organizational values cover a wide range of issues that will allow for the generation of multiple projects
Evaluation	
Evaluation refers to the standards and strategies applied by organizations in the evaluation of innovative efforts	Does the organization have multiple cycles of evaluation
	Does the organization evaluate project on a strict go or no-go basis (i.e., stringent criteria)
	Does the organization apply financial evaluation strategies
	Does the organization evaluate projects in terms of long-term value
	Does the organization revise projects after evaluation
	Does the organization shift resource allocation when a project is negatively appraised
	Does the organization evaluate projects in terms of originality as well as assessing the consequences of implementation
	Does the organization apply a fixed set of evaluation standards for different projects in different stages
	Does the organization judge exploratory projects on the basis of the knowledge the organization will gain in order to establish template projects
	Does the organization appraise developmental efforts by looking at market potential, resource requirements, or timeframes
	Does the organization appraise developmental efforts by looking at schedule performance, market acceptance, or profit
	Does the organization appraise projects in terms of specific goals

Figure 3: Continued	
Institutionalization of Innovation	
Institutionalization of innovation refers to organizational structures, practices and policies that contribute to, or support, the development and execution of plans for innovative projects	Does the organization have funds available for innovation
	Does the organization recognize and reward innovation
	Does the organization encourage professional engagement
	Does the organization provide projects with autonomy in resolving project related issues
	Does the organization have a proposal review board
	Does the organization allot a generous amount of time for project planning
	Does the organization have an open achievement oriented culture to innovation
	Does the organization have a horizontal structure
	Does the organization divide project work into functional areas
	Does the organization rely on contributions from multiple groups
	Does the organization have necessary information technology systems
Mission Definition	
Mission definition refers to the nature of the mission presented to the group	Does the group have established goals
	Does the group *explicitly* define team goals
	Does the mission specify relevant restrictions on group activities
	Is the group mission/goal relevant to the fundamental trends of the organization
	Does the mission communicate organizational values
	Does the mission/goal definition allow for individual contributions to an overall goal
	Is the scope of the mission appropriate/realistic
	Is the mission appropriately configured with respect to the project planning stage under consideration
	Does the mission place constraints on innovation
	Are missions extremely broadly or narrowly defined
	Does the mission have a fixed structure in that its scope is not malleable

Figure 3: Continued	
Team Planning Processes	
Team planning processes refers to the framework or blueprint around which plans will be formulated to guide creative work	Does the group consider adequate resource allocation
	Does the group consider time when planning projects
	Do group members play devils advocate when estimating time and resource requirements
	Does the group specify key time and resource allocations
	Are time and resource requirements negotiated in a cooperative manner
	Does the group hold back slack resources if new project needs emerge
	Is the group structured so that reallocation of resources is possible
	Does the group adjust plans as the project unfolds
	Does the group have a series of plans for a particular project
	Does the group monitor progress markers
	Are there a select few people in the group that are in charge of plan formation and adjustment
	Does the group have a team leader meeting
	Do group members monitor each other
	Are there established criteria for evaluating team performance and project outcomes
	Do team members have shared mental models
	Are problems articulated and addressed in either meetings or some other means of communication
Relationship Formation	
Relationship formation refers to the intra and inter-organizational relationships that are necessary for innovative efforts	Does the group collaborate with other organizations
	Does the group acquire customer, supplier, and competitor information from other organizations
	Does the group rely on outside organizations for necessary technical support
	Does the group include other intra-organizational groups into their planning efforts
	Is there collaboration between sub-teams
	Does the group contain a member who has multiple network connections
	Does the group define team member roles and expected contributions at different stages of plan development and execution
	Do groups recruit team members with certain needed skills
	Do groups recruit team members that will provide contradictory views as a way to balance certain key team members
	Does the group recognize collaboration with rewards, compensation, or recognition