

Technology Management

HOWE SCHOOL ALLIANCE FOR TECHNOLOGY MANAGEMENT

Why Companies Need to Adopt a Strategic Approach to Project Management



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Background

According to the conventional project management approach, projects are successful if they meet time, budget, and performance goals. Yet studies show that most projects are late, over budget, and do not deliver their expected objectives. Furthermore, even after completion, many projects do not contribute to their company's business success. We hypothesize that additional focus on the strategic aspects of projects will greatly contribute to the improvement of project performance. This research, which was funded by the Howe School Alliance for Technology Management, relates to the fol-

lowing questions: (a) To what extent do projects focus on their strategic and business aspects during project execution? (b) Does a higher strategic focus improve the chances of project success?

Using a combination of qualitative and quantitative research methods, we found that while project teams often recognize the strategic value of projects, they still manage their projects according to the conventional approach. We used a new three-dimensional strategic project management maturity model, which assesses projects according to their focus on operational excellence,

strategic focus, and inspired leadership. We tested how the level of maturity of the project on each dimension related to project success. Among other things, we found that higher strategic focus is associated with better impact on the customer, better business results, and better preparation for the future.

Introduction

Organizations initiate projects to create new, unique products, services or processes, or to provide improvements in existing ones. Thus, companies typically initiate

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DIRECTOR'S NOTE

Since projects are initiated for business objectives, the mindset of project management must shift from just meeting time, budget, and performance goals to achieving expected business results. Stefanovic and Shenhar present a model that can be used to assess where organizations are today in the maturity of their project management processes and to set specific goals for improvement.

Today's leaders face a landscape in which work is globally distributed and geographic, temporal and cultural differences create a new set of challenges. Leaders need a new set of skills that can enable them to bridge the boundaries created by these differences. Ryan's model of leadership focuses on behaviors that resemble those of an ambassador who has the skill and tact to span these boundaries. His article summarizes the issues and presents some practical suggestions for the 'ambassadorial behaviors' that can help leaders respond to the challenges.

November 2007 marked the 15th Anniversary of the HSATM Roundtable meetings. A few words commemorating this milepost are on the back page.

Larry Gastwirt

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projects to create new value that is impossible to achieve within the framework of ongoing operations. In a paradoxical way, however, since the establishment of modern project management as a formal discipline, it has focused primarily on the operational aspects, namely on executing processes in the most efficient way.

Many surveys show that most projects do not meet their expected goals. For example, a Standish Group study showed that over 70% of projects were either total or partial failures, failing to deliver on time, budget, or specifications. Moreover, out of the projects that successfully met their time, budget and requirements goals, many did not deliver the expected business results to their parent companies. It appears that traditional project management processes and tools are not sufficient for guaranteeing modern project success.

In this research, we hypothesized that while most projects focus on deficiency, they at the same time ignore the strategic aspects of the business. Furthermore, we also hypothesized that an increased strategic focus may be associated with better business success as well as success in other dimensions. Our research used a combination of qualitative and quantitative methods, employing first a case study research approach, followed by an empirical statistical field study.

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Research Description

Expanding on previous research on strategy in project management, we embarked on questions about the recognition of strategic value of projects, and the consequences on project management style. We were looking for evidence that projects of high-strategic value are recognized as such and are managed differently from other projects. In particular, we asked whether there are practices, behaviors, and considerations

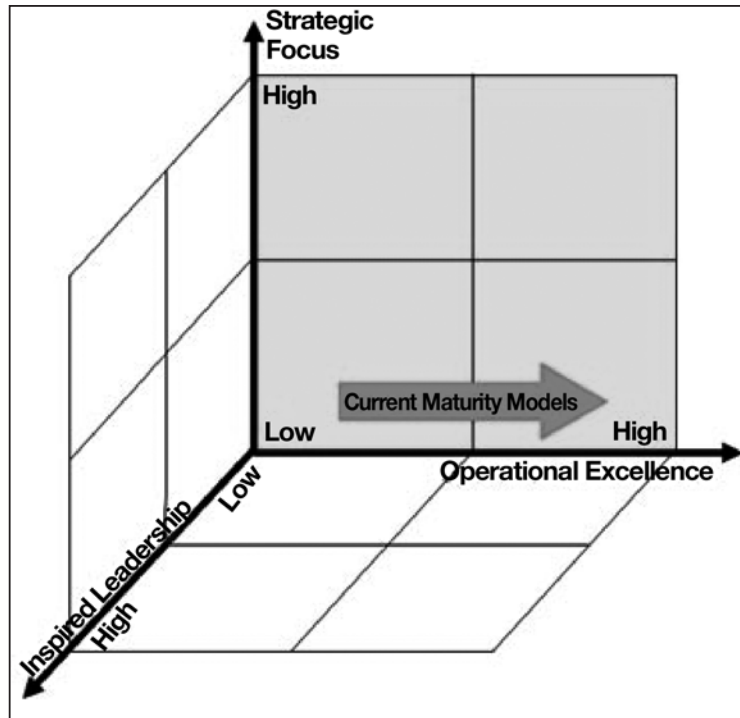


Figure 1: Operational excellence, strategic focus, and inspired leadership

present in project management that can be associated with strategy implementation, and whether strategy-related behavior in a project helps improve the project's success. Moreover, if the answer to the last question is yes, we sought to learn what other conditions influence this relationship.

We defined a strategic project management maturity (SPMM) model at the project level, which consists of three dimensions: operational excellence, strategic focus, and inspired leadership (see Figure 1). We employed the following definitions:

- Operational excellence: the extent to which project management activities (such as planning, execution, monitoring, and control) focus on completing the project within time, budget, and specification goals.

- Strategic focus: the extent to which project management activities that relate to planning, execution, monitoring, and control, focus on the expected business results from the project outcome.
- Inspired leadership: the ability of a project manager to inspire the project team, to induce team bonding, and to ensure team effectiveness.

Finally, we defined the project's strategic value as the project's potential contribution to long-term organizational goals.

The research had two phases. The first phase employed a qualitative case study approach on 35 documented cases, and its goal was to confirm the theory and prepare for the second phase. The second phase was quantitative, and involved statistical data on 164 projects from different countries. The goal of this phase was to test the strategic project management maturity (SPMM) model on a large number of projects and assess the relationships among the three dimensions of the model and project success dimensions. We expected that this examination would help us examine our major research hypothesis.

The Findings

Phase 1—Case Study

On the operational focus dimension, about half of the cases ranked high, and half ranked low (Figure 2). However, on the strategic focus dimension, only 20% ranked high. Interestingly, the correlation between the operational and strategic dimensions was virtually zero. This supported our initial assumption that these two dimensions are independent.

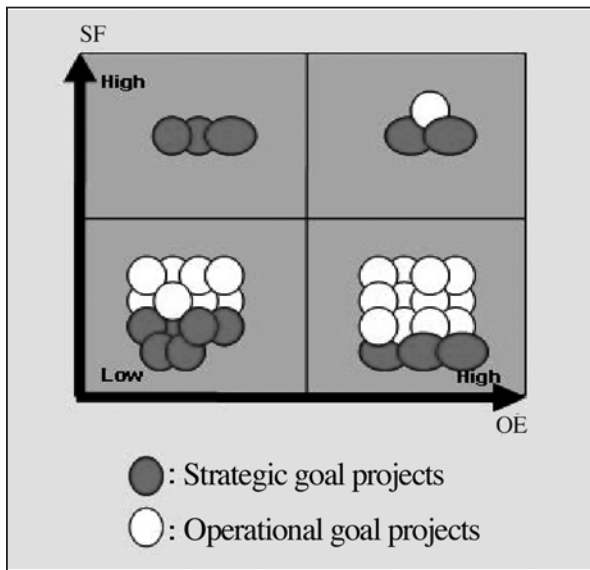


Figure 2: Strategic vs. operational goal projects

Fourteen of the projects had high strategic importance to their organizations. Out of these, only five exhibited a high degree of strategic focus. On the operational dimension, about two thirds of the projects ranked low.

Among the 21 projects whose goal was not highly strategic, two-thirds ranked high on the operational dimension, whereas only one was assessed as having high strategic focus.

When correlation coefficients were calculated between project goal (coded as highly strategic or not) and the project management style dimensions, the only significant positive correlation was found between project goal and the strategic dimension of project management style. This result suggests that a strategic approach is present more often in projects where strategic value is recognized.

Phase 2—Empirical Research

Our database included 164 project questionnaires, which were analyzed statistically. We calculated standard statistical descriptive for all items, correlations between SPMM dimensions and project success items, confirmatory factor analysis, as well as regression calculations.

We first calculated the SPMM scales' means (Figure 3). As expected, operational excel-

lence had the highest score of 2.67, followed by strategic focus (2.33), and inspired leadership received the lowest score (2.05). The averages are industry-wide and worldwide.

We next looked at the correlation

...the only significant positive correlation was found between project goal and the strategic dimension of project management style. This result suggests that a strategic approach is present more often in projects where strategic value is recognized.

- Operational excellence is associated with efficiency
- Strategic focus is associated with business success
- Strategic focus is associated with customer satisfaction

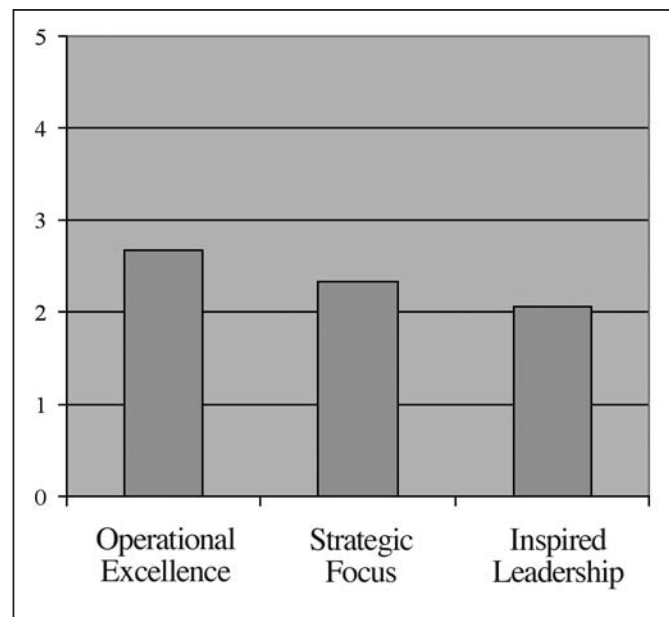


Figure 3: Means of SPMM dimensions: Industry- and world-wide

between these dimensions of maturity and project success of various dimensions, such as project efficiency, customer satisfaction, teamwork effectiveness, business success, preparing for the future, and overall success. Correlations analysis showed many significant correlations. For example, Teamwork effectiveness correlated with all other project success dimensions, supporting the conventional wisdom that teamwork success goes hand-in-hand with other aspects of project success.

The identified significant SPMM scale associations of project success factors were (Figure 4):

- Strategic focus is associated with future prospects
- Strategic focus is associated with overall success
- Inspired leadership is associated with teamwork effectiveness

Overall, we found that in most projects goals were typically identified as either operational or strategic. This demonstrated awareness of what projects mean to their organizations, and what the expected project outcomes are. In addition, most of the respondents clearly identified and described their firm's strategy, and explained how it is connected to their project goals.

However, most of the project teams considered project strategy to be simply an alignment of the project's operational goals with the firm's strategy by ensuring that the project's triple constraint (time, budget, and performance goals) is in agreement with the organizational goals. In these cases, carrying out the company's strategy had been reduced to effectively executing a project within the specified triple constraint. Strategic focus is generally not recognized, and usually there is no strategic alignment in monitoring and controlling activities.

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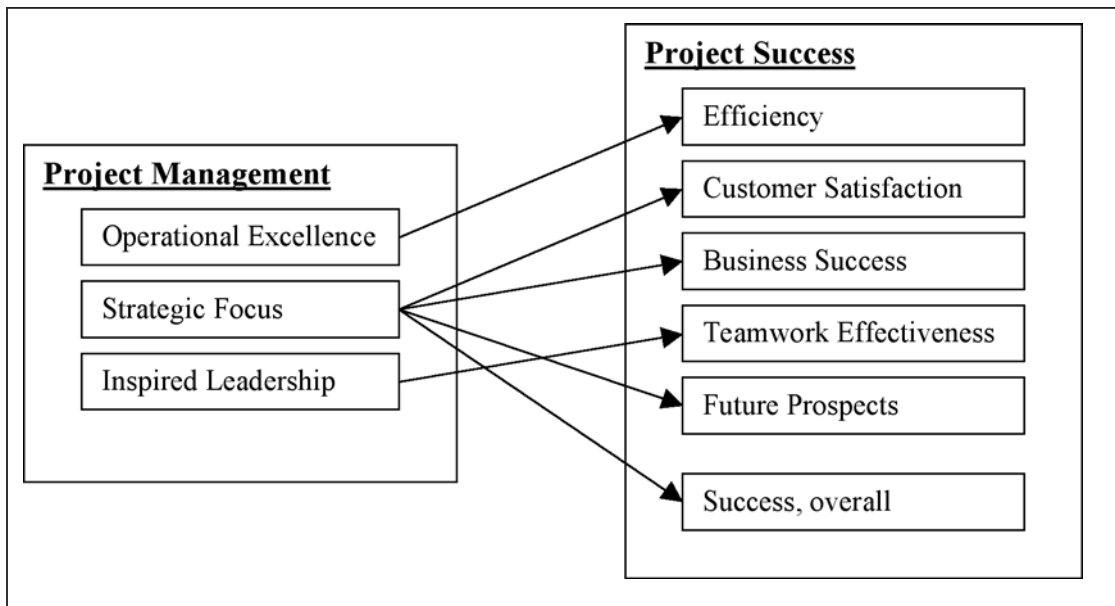


Figure 4: Maturity dimensions and their impact on project success factors

Conclusions and Implications for Managers

Our case study analysis indicates that most projects are still managed today in an operational manner. Furthermore, the majority of projects with high strategic values are also managed operationally, while almost all projects with operational goals are managed operationally. This, we believe, indicates that in spite of the strategic importance placed on projects, the traditional approach still dominates the field.

We thus believe that a new form of project management standard is needed. In addition to the operationally focused approach, strategy- and teamwork-related focuses should be developed and included within the current practices.

The analysis shows that most project managers and organizations recognize the strategic importance of a project and can distinguish between projects with operational goals and projects with strategic goals. It is much less clear, however, whether this recognition materializes during the project execution process. As we found, striving to achieve strategic goals through projects is in most cases reduced to aligning initial project goals with organizational strategy and maintaining the project's execution within the triple constraint. In this

manner, strategy-related behaviors are mostly expressed by operational behaviors.

This approach may work for projects with short-term operational goals. In these cases, it may be possible to focus project management on operational excellence and still achieve successful project outcomes. In projects of high-strategic importance, explicit focus of the project's strategic goals is necessary; neglecting it may have an adverse effect on project success.

The larger scale empirical findings confirmed that project management styles could be distinguished according to three dimensions: operational excellence, strategic focus, and inspired leadership. Operational excellence measures the degree to which a project manager manages the project efficiently and keeps it within the planned time and budget constraints. Strategic focus measures the degree to which a project is executed to fulfill the intended business goals. Inspired leadership relates to the project manager's activity to enable team-

work processes, team bonding and effective cohesion.

It comes as no surprise that operational excellence predicts project efficiency. However, operational excellence predicts neither one of other project success dimensions; e.g. operational excellence will not translate to customer satisfaction or business success. This finding makes it necessary to focus attention on other project management maturity dimensions as well, unlike what is assumed in current project management practices.

Strategic focus seems to be a key element in achieving customer satisfaction, business success, future prospects, and overall success. Practically, all lasting, post-project, effects are predicted by strategic focus.

Inspired leadership predicts teamwork effectiveness. We expected it to influence other success elements as well, especially customer satisfaction, but it seems that the effect is only indirect, through teamwork effectiveness.

The implications of these findings to management are clear. Having project goals initially aligned with business strategy and hoping that this will guarantee achieving the project's strategic goals is not enough. Instead, a conscious, on-going evaluation of project activities against its strategic goal alignment is necessary. Similarly, just managing the project's operations, without focusing on the team processes, is not enough either. Here too, a constant effort to enable team processes, team bonding, and team effectiveness is necessary.

We thus believe that a new form of project management standard is needed. In addition to the operationally focused approach, strategy- and teamwork-related focuses should be developed and included within the current practices. Project management needs to focus on business goals achievement and value creation, and not just on achieving the triple constraint.

The major elements of this recommended approach can be summarized as follows:

- Projects should be seen as part of the

strategic business processes in the organizations; their goals should be to contribute to the business success of the organization and not just meeting time, budget, and performance goals.

- Projects should be selected according to their contribution to the company's strategy and long term goals.
- When managing a project, project teams need to learn how to focus on the strate-

and dynamics in the competitive environment.

Further research is clearly needed. Because operational excellence is well researched, new research directions could be on the strategic focus and inspired leadership dimensions. For example, one may ask whether strategic focus is more important for project success in high-uncertainty or high-technology projects, than it is in low-tech projects. Is inspired leadership more important in certain industries than in others? And is strategic focus more important for projects with external versus internal customers? ■

Because operational excellence is well researched, new research directions could be on the strategic focus and inspired leadership dimensions.

- Project success should be defined up-front to set the expectations from the project. It should be assessed on several major dimensions such as efficiency, customer satisfaction, team effectiveness, business success and preparing for the future.
- Project managers should be accountable for achieving the business results and other success dimensions, and not just the triple constraint.

gic and leadership aspects of the project, not just its operational efficiency. They need to develop a specific project strategy and focus the team's activity on creating competitive advantage as well as future prospects from the project.

- Project reviews by top managers should include examination of the strategic progress of projects, their expected success on all dimensions, and their relevance in the market given the changes

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Diversity and Virtual Teams

Michael Ryan

Virtual teams have been proliferating in recent years in all sectors -- commercial, government, public, and private. This shift from the traditional face-to-face (FTF) team structure presents some of the greatest challenges for a team leader, but paradoxically, the underlying dynamics of a virtual team can provide opportunities to outperform a traditional team. Our investigation of leadership behaviors that can meet these challenges and consequently fuel these opportunities is the focus of this paper.

The format this paper will follow has four parts. Initially, we will present an image of the virtual team. This image will not only seek to identify the prevailing structure, but will also discuss the reasons these teams have become so ubiquitous. Additionally, we will present some of the extended attributes of virtual teams – attributes which contribute significantly to the valence or degree of “virtualness.” The second part will investigate the contribution social network theory makes in understanding the interpersonal and inter-organizational dynamics that complicate the leadership needs within the virtual team. Part three will present the proposed leadership behaviors that contribute to our model of Ambassadorial Leadership TM. Finally, we will present some of the opportunities that emerge as a direct result of the interactions of the virtual team dynamics with those of the Ambassadorial Leadership behaviors. These consequences can elevate the virtual team from a strain on intra-organizational relations to a competitive advantage.

Virtual Teams

One element that obviously differentiates a virtual team from a traditional team is the lack of face-to-face engagements. The question arises as to whether this is the only consideration. Our first consideration, one that separates a team from a group, is that virtual teams must have a degree of interdependence in order to be considered a team. Without the interdependence, it is simply a workgroup, with the output the collective sum of the individual efforts. The second component concerns the distribution of members. Some researchers have limited these teams to those that are globally or geographically dispersed, even to the extent of indicating that members must represent at least two distinct nations. Consequently, they often use the name “globally distributed”

rather than virtual to describe these teams. The third factor that is prevalent in the literature is the need for technology-assisted communication in order for these teams to overcome the barriers that exist. While each of these factors can be debated, we have chosen to utilize the most common subset for our definition of virtual teams:

A virtual team: (1) has minimum or no FTF interactions and is dispersed geographically, organizationally, socially, and/or culturally; (2) uses communication that is technologically facilitated; (3) uses communication modes that are frequently asynchronous and temporally displaced.

Virtual teams have been adopted by today's organizations for a multitude of reasons. Those that are most frequently cited in the literature include: technology, economics, diversity, human capital, and market positions.

(1) **Technology:** The advent of the computer and the subsequent changes in telecommunication has served to turn the world into a global neighborhood. Technology has enabled communications to reach across the globe instantly and simultaneously. Technology thus serves as an enabler for organizations to bring these teams together.

(2) **Economics:** The economics involved are a direct result of the technology and the climate of the times. Organizations can establish sophisticated communication channels using the newer technologies. These channels require minimum investment as they usually utilize the infrastructure already deployed for IT purposes. This reduces the need for travel expenses and the losses in productivity that can be attributed to the logistics of travel.

(3) **Diversity:** We should not be surprised that with the growth of these teams, today's

organizations have had a greater opportunity to diversify their membership. Simply by the fact that the physical constraints have been removed, teams can span multiple geopolitical and socio-economic communities. This diversity has potentially enhanced the richness of these teams by bringing additional perspectives into view.

(4) **Human Capital:** Human capital speaks to the centrality of an individual. An effort to increase the centrality or human capital of subject management experts is of critical importance for any organization. In the past, physical constraints imposed a limit on the availability of those experts that might be engaged by the team. With the expansion of virtual teams, these experts may be engaged by multiple teams without ever leaving the confines of their normal workplace.

(5) **Market Position:** Finally, the market place has provided an incentive for organizations to engage virtual teams as a strategic initiative. Virtual teams provide support for decentralizing. Through this decentralization process, the modern organization has been able to establish a presence in more markets. As a consequence, within these new markets, they may have the benefit of being perceived as a member of the community.

Extended Attributes

Although we have defined virtual teams as having minimal FTF interaction, there is still a question as to whether this restriction is due to physical constraints or other factors. It is essential to realize that “virtualness” is not a dichotomous value. “Virtualness” exists along a continuum and is influenced by a number of different factors. In previous research, Karen Sobel-Lojeski and Richard Reilly (2005) have presented this continuum as a measure defined by Virtual Distance

TM. Some of the primary contributors to this distance are identified below:

Relational Histories: These histories may involve individuals or groups. In the individual cases, the history may reflect either direct or indirect relationships. An indirect relationship may be evident when two parties both have a relationship with a third actor. A group history might, as an example, involve functional or corporate relationships. These relationships may be influenced either positively or negatively by these previous histories.

Cultural Factors: These factors may include socio-economic, racial, religious, corporate, or any other culturally diverse perspective.

Infrastructure: The underlying support that exists for each member individually in pursuit of the technologically facilitated medium being used by the virtual team.

Isolation: The level of separation that exists between team members and also between individual members and their supporting environment can contribute to the sense of isolation.

Task Interdependence: Greater interdependence between members decreases the perception of distance between those members.

Team Size: The larger the team, the more likely that sub-groups will emerge. These sub-groups may present a challenge to the shared mental model that is needed for a team to overcome the differences that may exist.

FTF Interaction: The frequency and quality of any FTF interaction can serve to either reduce or promote the distance perceived between members.

Multi-Tasking: It is the rule, rather than the exception, that individuals are involved in multiple activities simultaneously. The greater the demands placed from outside the team, the greater will be the separation from the team.

Technical Skills: This aspect may inhibit the relationship between members in two areas – team task and team communication. Team members may find themselves isolated: first, if the team task is technically oriented; second, if they are not adept at using the

communication medium that is supporting the team.

Collectively, these items determine the level of virtualness that exists within the team. They also provide focal points for the team leader to address when trying to unify the team in their pursuit of the assigned tasks.

The Social Network

In spite of the fact that virtual teams are not actively engaged in face-to-face interaction, they must be considered a social network. Social network analysis is concerned with the relationships among individuals and groups. In a virtual team these relationships might be direct or indirect. They might also have varying degrees of relative strength. We are by nature social beings. In any social situation there is a natural tendency to congregate with those with whom we share the greatest affinity. This process of joining others with shared characteristics, traits, interests, etc. serves to reduce the uncertainty presented by any novel environment (Fiol and O'Connor 2005). The characteristics that are shared represent the faultlines (Lau and Murnighan 1998) that separate the group from others. The more similarities shared by the individuals within the group, the stronger the faultline.

Traditional teams frequently divide along functional lines. Virtual teams present additional complexities. The faultlines that develop are magnified because the distances from the others are more pronounced. While functional differences might exist, they may be secondary to geographical, social, cultural, or other differences. These faultlines, which can divide the team into multiple sub-groups, each with their own unique social identity, present a significant challenge to the team's purpose and therefore to the team's leader. Conversely, as we mentioned earlier, if managed well, the challenge may also present a significant opportunity.

The Ambassadorial Leadership Model

How, given all of the factors that contribute to distance between the members of a virtual team, is the team leader to surmount these obstacles? We propose a series of behaviors that are specifically directed at reducing the virtual distance that exists between members. These behaviors address some of the social network issues as well as those cultur-

al and social aspects that add to the general distance that is perceived by the members.

It is important to understand that the ambassadorial leadership behaviors are not meant to be an extensive list of all the leadership behaviors that must be evident in a virtual team. Instead, they are a set of behaviors that complement the current prevailing leadership models. These behaviors emerged from the study of the challenges presented by virtual teams and are offered as a means to overcome those challenges and enable a more collaborative environment. Ambassadorial leadership specifically includes the following behaviors:

1. Internal boundary spanning
2. External boundary spanning
3. Shared/delegated leadership
4. Recognition
5. Advocacy

Internal Boundary Spanning

For a virtual team, internal boundary spanning is defined by the activities that bridge the faultlines within the diverse team. The needs that drive the interdependence between team members dictate the level of boundary spanning that must occur; the more diverse the team, the greater the need to actively exchange information. This boundary spanning exists at both the individual and sub-group levels. As the team engages in collaborative effort, the members perceive it to be more effective and there is a positive effect on team cohesion (Cohen, Ledford and Spreitzer 1996).

External Boundary Spanning

Teams, whether traditional face-to-face or virtual, do not exist in vacuums, and part of their effectiveness may hinge on the relationship between the team and external sources.

External boundary spanning addresses the issues that exist between the team and these outside sources. Some of these issues include: resource acquisition, information gathering and feedback, and establishment of a channel for communication (Ancona and Caldwell 1992a).

Resource acquisition is concerned with the ability of the team to secure those resources that may not exist internally. These resources may include time, finances, information, or even additional team members. Information gathering and feedback is specifically

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focused on the perceived value of the team's offerings. It is meant to ensure that the team remains current with the needs of the outside stakeholders. Communication channels serve as a foundation for the team to also release information that they deem important. It is also one of the vehicles that may be used in recognition and advocacy.

Shared Leadership

Shared leadership and delegation involves a division of the leadership roles based upon the situation and skill sets needed. It is a recognition that in a diverse and dispersed team environment one individual may not be able to fulfill all the leadership roles that may emerge over the life of the team's existence. This may particularly be evident within the sub-groups that emerge as a result of functional faultlines. Shared leadership confers additional status and responsibility on selected team members resulting in further cohesion within the team.

Recognition

Recognition is a special behavior that adds to the cohesion that can develop within the virtual team. It reinforces the feeling of self-worth of an individual team member or a sub-group within the team. Simultaneously, it may also serve to promote the individuals as models to the other team members. This behavior serves to both motivate and reward team contributions.

Advocacy

Advocacy is an extension of the behaviors that exist within boundary spanning. It will utilize those communication channels that are developed internally and externally. Within the team, advocacy refers to the leader or other team member actively promoting, pleading, or arguing in support of a sub-group or member's efforts. Externally, advocacy is designed to secure external support for the team and individual members. Advocacy together with recognition may serve to build an esprit de corps and in so

doing, it will reduce virtual distance between members.

Challenges and Opportunities

Earlier in the discussion, we stated that the challenges that were inherent in virtual teams also might be considered opportunities if they were properly managed. If we consider the virtual team from the social network perspective, we have a collection of individuals and sub-groups that are loosely held together by a single individual, the team leader.

In the discussion of faultlines earlier, we presented the case that faultlines occurred because of differences that existed within the population. In point of fact, if there were no differences, there would be a single homogeneous group. The problem with a homogeneous group is that there is no opportunity to learn. Everyone knows what everyone else knows.

So this presents us with a conundrum. Which is the more ideal scenario? Is a virtual team that is a loosely associated group with little in common preferable to a homogeneous team that has no opportunity to learn? How might we reconcile this problem and create an effective team?

The first objective then of ambassadorial leadership is to build the team into a more cohesive structure. In social network theory, whenever two nodes (individuals or groups) exist without a shared or common member, we consider that vacancy to represent a structural hole (Burt 2004). Structural holes when filled create a bond between the two nodes that previously did not exist. This bond then serves as a channel across which information may be exchanged. It is in the process of exchange that the opportunities present themselves. This is the same concept that is proposed within the theory of diffusion. Diffusion can occur only when a group is bridged to an outside source that can then introduce something new to the group.

The potential strength of a virtual team lies in its diversity. Recent studies have shown that by embracing the diversity rather than trying to eliminate it, teams are significantly more effective (Ely and Thomas 2001; Derek and Kecia 2004). Quite simply put, teams that learn from each other can create solutions that otherwise might remain hidden. Team leaders that use the ambassadorial leadership behaviors create an environment in which diversity can be embraced and the free exchange of information can be promoted within the team and between the team and those entities that lie outside of it. While the team leader may be successful in promoting these behaviors within the extended team, it is also incumbent upon the parent organization to provide support in the efforts. If the organization views diversity only as a challenge, it may undermine even the most zealous efforts of the ambassadorial team leader.

Table 1 summarizes the challenges faced by the leaders of virtual teams, the general ambassadorial behaviors required to respond to these challenges, the specific actions leaders can take, and the resultant opportunities or benefits accruing to the team and team members.

References:

- Ancona, D. G. and D. F. Caldwell (1992a). "Bridging the boundary: External activity and performance in Organizational Teams." *Administrative Science Quarterly* 37(4): 634.
- Burt, R. S. (2004). "Structural Holes and Good Ideas." *The American Journal of Sociology* 110(2): 349.
- Cohen, S. G. and D. E. Bailey (1997). "What makes teams work: Group effectiveness research from the shop floor to the executive suite." *Journal of Management* 23(3): 239.
- Cohen, S. G., G. E. Ledford, Jr. and G. M. Spreitzer (1996). "A predictive model of self-managing work team effectiveness." *Human Relations* 49(5): 643.
- Derek, R. A. and M. T. Kecia (2004). "Blending Content and Contact: The Roles of Diversity Curriculum and Campus Heterogeneity in Fostering Diversity Management Competency." *Academy of Management Learning & Education* 3(4): 380.
- Ely, R. J. and D. A. Thomas (2001). "Cultural diversity at work: The effects of diversity perspectives on work group processes and outcomes." *Administrative Science Quarterly* 46(2): 229.
- Fiol, C. M. and E. J. O'Connor (2005). "Identification in Face-to-Face, Hybrid, and Pure Virtual Teams: Untangling the Contradictions." *Organization Science* 16(1): 19.
- Lau, D. C. and J. K. Murnighan (1998). "Demographic diversity and faultlines: the compositional dynamics of organizational groups." *Academy of Management Review*: 325(16).
- Sobel Lojeski, K., R. Reilly and P. Dominick (2006). *The Role Of Virtual Distance in Innovation and Success*. HICSS 39th Annual Conference. Kauai, HI.

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Table 1

The Challenge	Ambassadorial Behavior	Actions	The Opportunity
<p>Building a shared mental model when there may be a lack of unified core values</p> <p>Maintaining individual core values while participating within the team</p>	Internal Boundary Spanning	<p>Promote relationship building between close and distant team members by encouraging sharing of personal information.</p> <p>Educate local team members on differences in cultural values and communications styles of remote members.</p> <p>Establish key relationships with members at remote locations who can serve as mentors and coaches</p>	<p>Team: Embracing diversity provides a means to introduce multiple perspectives; builds team cohesion and trust.</p> <p>Team Members: Elucidating and explaining the differences to team members from other cultures, builds team trust and extends the personal social network.</p> <p>Key Member: Serve as liaison between team and remote members; can work as a cultural translator.</p>
<p>Aligning team goals with various external entities</p> <p>Maintaining skills within original discipline and relationship with actual business unit/functional group</p>	External Boundary Spanning	<p>Establish communication channel to ensure information is freely exchanged.</p> <p>Formulate strategic plan with distant members to develop liaison relationships with their close external groups.</p> <p>Develop understanding of resources available from external groups.</p>	<p>Team: External entities become partners –exchanging information and resources to secure best results.</p> <p>Team: Communication channels ensure that team goals remain viable.</p> <p>Team Members: As liaisons are better able to judge what resources might be beneficial (in both directions) and opens communications to support skill retention/development.</p>
<p>Providing active leadership across dispersed team and diverse disciplines</p> <p>Conveying unique requirements of the discipline or culture to a leader with a different background</p>	Shared Leadership	<p>Create conditions for shared leadership at distant locations.</p> <p>Establish key relationships with members at remote locations who can serve as mentors and coaches.</p>	<p>Team: Brings the best talent to bear as dictated by the situation, promoting trust and building greater collaboration.</p> <p>Team Members: Actively presenting unique viewpoints and representing the sub-groups as viable collaborators.</p>
<p>Motivating dispersed team members and sub-groups.</p> <p>Establishing individual's value to functional group</p>	Recognition	<p>Depending on the core values of the individual's culture; provide open recognition of personal performance or sub-group performance.</p> <p>Privately recognize the contributions made by an individual</p> <p>Privately or publicly (depending on core values) provide recognition of performance to the individual's functional group.</p>	<p>Team: Reinforces the self-worth of the individuals and/or groups that are recognized.</p> <p>Team: Provides a role model for other team members.</p> <p>Team Members: Recognizing the contributions of others may add to the group cohesion.</p>
<p>Resolving conflicts that result from differences in core values.</p> <p>Ensuring team contributions are viewed favorably</p> <p>Adjusting to changing demands of external entities</p>	Advocacy	<p>Monitoring conflicts and problems between close and distant members</p> <p>Serve as a mediator in cases of conflict.</p> <p>Acknowledges team's contribution to organizational strategy externally.</p> <p>Monitor expectations (internal and external) and ensure alignment with reality.</p>	<p>Team: Conflicts stemming from diversity provide opportunity for creative solutions.</p> <p>Team: Linking the team accomplishments to strategic goals elevates individual and team status and reflects favorably on contributing functional groups.</p> <p>Team: Frequenting checking with the stakeholders ensures that the end product will still have value.</p>

Roundtable Meeting Take-Aways

The HSATM Roundtable meetings in 2006 and 2007 dealt with various aspects of creativity, showing that this 'elusive' concept was amenable to a number of systematic management tools that can enhance the intrinsic creative characteristics of human beings. We are printing here the 'Takeaways' from the first meeting in the series.

Feb. 15, 2006

UNDERSTANDING CREATIVITY TO ENHANCE INNOVATION

The February 15, 2006 Roundtable meeting was hosted by ARDEC, Picatinny Arsenal. The topic was an extension of the broad theme of innovation, which had been the focus of our 2005 Roundtable meetings. Larry Gastwirt opened the meeting with the comment that the Alliance would continue to deepen our understanding of innovation, moving our emphasis in 2006 to the creativity dimension. He pointed out that creativity is an aspect that applies throughout the innovation process. He also indicated that, while the topic is a difficult one to treat in terms of a brief overview, we would follow the same approach that was successful last year and begin with a broad look at creativity, to provide a foundation upon which we can build both understanding and ability during the course of the year.

The following is a summary of the presentation by Tony Le Storti, executive consultant for IDEATECTS, who was the guest facilitator for this Roundtable and its reprise on the morning of April 26, 2006 at ISO, Jersey City.

Exploring the nature of creativity, Tony noted that creativity seems to exist in two categories. Viewed as a process, creativity is the

cognitive process by which new ideas are formed, evaluated, and actualized. Conceptualized as a product, creativity is a novel and appropriate response to an open-ended problem (Teresa Amabile). Further, one can view creativity as a natural power of the mind, a skill set that can be developed, an attitude or style, and a means for problem solving. Creativity also seems to have two "faces" or aspects: invention and discovery, which have a reciprocal relationship.

Looking at the connection between creativity and innovation, one can define innovation as the creation of value through the implementation of new ideas. In this definition, which the Alliance has been using, it is noteworthy that there is a creative act in terms of both the novel ideas and the new value that those ideas represent. Creativity, as the centerpiece of the "front end" of innovation, is the insight that ignites or initiates the innovation process, but it is also the "brainpower" frequently required to bring an initial concept to full fruition in order to implement or commercialize it. One may expect, therefore, strongly focused creative efforts in the invention/discovery and idea refinement phases of the innovation process, but one should not be surprised to see creativity manifested throughout the process.

While each individual approaches creative efforts in a unique manner, it is also possible to abstract or generalize "the creative process." In doing so, however, one should not view such a generalized version as a linear, set sequence. Rather, it may be more appropriate to see the "phases" as cognitive states that people may occupy as they go about their creative problem-solving.

Having noted that, the creative process

begins with desire or motivation. It is the sensing of a "gap" between a goal state and the current state that establishes the internal tension that will drive the rest of the process. Preparation is the phase in which problem-solvers immerse themselves in the problem situation; it may be a matter of gathering resources, doing additional learning, or getting to understand the challenge better. Preparation is also the time for "rituals," such as putting on music or finding a quiet spot, that prepare the thinker physically or psychologically to be creative.

Manipulation or composition is the phase in which problem solvers consciously work to form the new concept or pattern. But since creativity cannot be willed on demand, people often experience a period of incubation, a time in which they consciously leave their problem, but subconsciously continue to work on it. This is sometimes followed by intuition, the sense that the creative answer is about to crystallize. Then comes illumination, the "Eureka!" moment of creative insight. But pragmatic creativity requires a further stage: verification, the evaluation and (initial) implementation of the novel idea.

One may also consider the components of creativity, the clusters of skills and traits that come together to engender productive thinking. These include domain skills (job-specific knowledge and abilities), process skills (creative problem solving and decision-making ability), motivation (especially intrinsic motivation that focuses on the value of the work itself), and environment (hopefully, a situation that promotes and encourages creative thought).

Further, creativity can be characterized by a set of behaviors and characteristics. As Paul Torrance has pointed out, the cognitive

aspects include fluency (the ability to generate many potential solutions to a problem), flexibility (the ability to generate different kinds of solutions from different perspectives), elaboration (the ability to combine or build upon basic ideas), and originality (the ability to produce novel or unique concepts). These are complemented by a set of affective traits including courage, tolerance for ambiguity, imagination, competence for complexity, curiosity, open-mindedness, playfulness, and persistence.

Unfortunately, creativity is a somewhat perishable phenomenon that can be prevented or constrained by a variety of deterrents or hindrances. While there are too many such obstacles to be listed individually here, they can generally be placed in the categories of habit, perceptual blocks, emotional or psychological constraints, and cultural and/or environmental obstacles. For example, one interesting cognitive bias that touches on a number of these categories is structured

imagination (Thomas Ward). Structured imagination is the anchoring of creative thought to current reality and experience. Research on this topic indicates that even efforts at very open-ended creativity are often constrained by current concepts and categories.

There are, however, established approaches that promote creative thinking. These include provocative problem definition and analysis, focusing on function, challenging assumptions, thinking analogically, exploring the unexpected, and utilizing negative evidence to promote new learning. Also, there are some well-established and proven problem-solving models or approaches that help to structure creative thinking. These include Osborn-Parnes Creative Problem Solving (Alex Osborn & Sidney Parnes), Syntectics (George Prince), Lateral Thinking (Edward de Bono), TRIZ (Genrich Altshuller), and Ideatectics Problem Solving (Anthony Le Storti).

It is also worth noting that experiential creative thinking has shown itself to be a curvilinear, recursive process. Rather than being linear and sequential, more challenging problem-solving often moves forward and backwards and forward again numerous times as the problem-solver learns, evaluates progress, reconsiders formulations, generates new alternatives, and so forth.

Tony reflected that, as we consider this study of creativity, it might be heartening to reflect on Goethe's dictum: "Every individual is a marvel of unknown and unrealized possibilities." At the reprise of this first Roundtable of 2006, Tony also stated that "everyone is creative; it is a natural power of the human brain. The real question is "are you being creative?" His prime thesis, as stated above, is that there exist real processes/models that can enhance the intrinsic creative characteristics of human beings. Future Roundtable meetings will explore the application and benefits of some of the methodologies. ■

2007 ANNUAL CONFERENCE CONDUCTED IN JUNE

COMMERCIALIZING NEW IDEAS: Crossing the Bridge from Idea to Innovation

The Sixteenth Annual HSATM Conference was held on June 12 at the Babbio Center for Technology Management on the Stevens Campus. It dealt with the process of securing organizational alignment and support to develop and commercialize new concepts – in other words, to cross the bridge from idea to innovation. Over 100 participants heard four distinguished speakers share knowledge of how organizations have overcome the barriers and challenges associated with advocating, nurturing, and developing new ideas, on the road to innovation.

Peter W. Schutz, former CEO of Porsche A.G. and international authority on leadership and business management techniques, spoke on *The Driving Force: Extraordinary Results with Ordinary People*. Schutz outlined lessons learned to achieve successful innovations at Porsche and Cummins.

Dr. Jack Emert, Chief Scientist for Infineum Ltd., a joint venture between ExxonMobil and Shell Chemical and an Alliance Partner, presented *Anatomy of a Technical Innovation*. Emert described the strategies, processes, and critical enabling factors used to design and implement a successfully commercialized product at Infineum.

Dr. Christopher Barlow, of DePaul University and the Co-Creativity Institute, discussed *Innovation Leadership: Heroic or Collaborative?* He outlined the changes in actions and processes needed to solve the innovation problem from the beginning of the creative efforts.

Dr. Richard Tait, former executive with DuPont and a founding member and innovation manager for their Center for Creativity and Innovation, presented *Building Innovation Execution Competency*. Tait described an integrated framework for effectively structuring and implementing the critical elements to achieve innovation excellence in a complex business organization like du Pont.

All of the speakers were very well received. Perhaps the best summary measure of the success of the Conference was the response to the following question: indicate your satisfaction with the Conference overall, as an effective use of your time, on a scale of 1 to 5 (5=highest). Three-quarters of the attendees responded, giving an average rating of 4.6. A good reception indeed!

HSATM

HOWE SCHOOL ALLIANCE FOR TECHNOLOGY MANAGEMENT

15 Years of the Alliance Roundtable

Fifteen years ago, on November 18, 1992, the Howe School Alliance for Technology Management held its first Roundtable meeting. The meeting was concerned with metrics for measuring R&D effectiveness.

The Alliance was in its first full year of operation in 1992, and the Roundtable meetings were introduced as a means of transmitting recent research results and best technology management practices to Alliance partner organizations. The concept has flourished; in November 2007 the Alliance conducted Roundtable meeting number seventy-two.

The Roundtable meetings have been concerned with the management of technology in the broadest sense of the term. Among the issues addressed have been achieving effective multi-disciplinary teaming; technology strategic planning; R&D portfolio management; motivating and leadership for innovation; using non-traditional reward systems; the "fuzzy front end" of the innovation process; stage-gate processes; achieving 'radical' innovation; training to maintain critical competencies; intellectual property management; project management; how to 'kill' a project; understanding creativity to enhance innovation; turning innovation into a powerful business strategy; outsourcing technology development; working virtually; creative problem-solving; transforming mindsets for collaborative innovation; and many more.

For the last fifteen years, the Alliance Roundtables have provided a forum in which such issues have been looked at afresh, providing answers to such questions as: Which parts of the conventional wisdoms still apply, and which should be abandoned? What new approaches have been tried? Which ones have worked? What are the pitfalls others have encountered? And so forth. The Roundtables have provided the opportunity to address these questions in a collegial atmosphere, taking advantage of the most recent academic findings and the experiences of a diverse network of technology managers from industry and government.

Much has changed since that first Roundtable meeting in 1992. There was no Howe School of Technology Management then, just a Department of Management in which very little research was being done. The Alliance began to sponsor and fund faculty research programs. Through these programs, and the Alliance role in founding the Executive Masters in Technology Management program, the Alliance was instrumental in attracting leading teachers and research scholars to Stevens, and in that way played an important role in the establishment of the Howe School of Technology Management.

INFORMATION

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Visit the HSATM website: **<http://howe.stevens.edu/HSATM>**

To download articles from past issues: **<http://howe.stevens.edu/HSATM/Newsletters>**

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