CONTEMPORARY ISSUES IN PROJECT MANAGEMENT: THE TWENTY-FIRST CENTURY PROJECT MANAGER'S PERSPECTIVE

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ABSTRACT

The purpose of this investigation is to review contemporary issues impacting project managers in the twenty-first ("21st") century. Modern business dynamics elicit more changes today than in previous decades; project managers play a role in nearly all facets of organizational change, and thus, must be cognizant of contemporary business practices and adapt in order to facilitate change on time, within budget and in line with project scope. Specifically, this paper reviews key business areas of globalization and cross-cultural challenges, technology, organizational structure, educational and professional development, and knowledge management areas related to project managers. The basis of this paper is to address these contemporary issues through a review of current literature, identify sources of these challenges, seek resolution, and create a multi-disciplinary point of view. Theory development and implications for future research are also discussed.

Keywords: Project Management, cross-cultural challenges, contemporary business practices, knowledge management, organizational change management.

INTRODUCTION

The 21st century has changed the face of project management due to increasingly complex business environments. Project management is "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements." (Schwalbe, p. 7) This paper will explore the following five major issues that the 21st century project manager ("PM") may experience: 1) globalization and cross- cultural issues, 2) technology, 3) organizational structure, 4) education and professional development and 5) knowledge management competence. These particular issues are becoming progressively more significant in contemporary business situations.

GLOBAL AND CULTURAL ISSUES

The 21st century has brought about numerous changes to the contemporary business environment. Technology and new innovations have enabled business to take place across regions, nations and even oceans. At times, the teams have never even met. However, projects must continue to be successful while combating location difficulties as well as culture and

language barriers while keeping in mind that there is only 24 hours in a day. Not all projects deal with all these issues, but the 21st century has made them more common.

Cultural Differences & Language Barriers

Culture can be defined as "the customary beliefs, social forms, and material traits of a racial, religious, or social group" (Culture, 2008). Cultures vary across countries and regions and possess a formidable challenge to PMs. Avoidance of cultural clashes during business operations is one of the major responsibilities of 21st century managers. "Project managers work with the project sponsors, the project team, and the other people involved in a project to meet project goals" (Schwalbe, 2006, p. 5). Each of these individuals could come from a different background and demand different etiquette. Key to becoming successful with many cultures is having the insight into the cultural dynamics of a country or region. This proves very helpful to understand why people act the way they do, and the appropriate way you should act while working together. Before or as part of the kick-off meetings, engaging in a cultural sensitivity training alleviates culture miscommunication and enables the stakeholders to get to know each other.

There is a school of thought that maintains that the world is becoming more of a melting pot, and another viewpoint that counters the "melting pot" theory with "mosaic" or "salad bar" metaphor from the perspective of a multiculturalist. The 21st century PM must be aware of religious or public customs. A manager in Europe with stakeholders in the US may not be aware of the US custom of Thanksgiving and the generally given public holiday that follows that Thursday. It is the team's responsibility to have these public or religious holidays published for the group's awareness. Some religious holidays for example Ramadan have "a deep social and economic impact on a fifth of the world's population and is a phenomenon worth understanding by future leaders" (Rehman, 2003) Ramadan is observed by Muslims who fast for a month, their working hours may be modified during this time to facilitate the religious requirements. The 21st century has given organizations the possibility to gather from a global resources pool but one must now understand the religious or public culture of these resources. Projects must take into account these issues and incorporate any potential delays into the time goal.

One of the obvious differences between cultures is the multitude of languages. Human resources may be more readily available overseas but not everyone communicates in the same language. "In the 20th century, English became the universal language of business" (Bacchus, 2006). However, in the 21st century, we are witnessing countries like India and China becoming increasingly important in business and are reaching economic superpower status. We could see a business shift towards the chosen language being Mandarin Chinese. Distinct placement of "multilingual people in key positions to bridge the language barriers," (Lemmex, 2005. p. 5) and ensuring that the team members are aware of who they are, eases some language barriers.

International Teams

The logistical formation of the project team in the 21st century differs from the past. With the possibility of team members being from each corner of the world, the 21st century manager must devise a solution to continue to have effective communication and sharing of information. "A team is a small number of people with complementary skills who are committed to a common

purpose, performance goals, and approach for which they are mutually accountable" (Katzenbach & Smith, 1993). Therefore if the team is mutually accountable, members have personnel investment in succeeding and to ensure the other team members succeed. This can only be done with successfully communication. 21st century technology has allowed members to not even leave their desk and still be able to see and communicate with members virtually. It is important to know and understand who is involved in the project team. It is the PM's responsibility "to meet project requirements and satisfy stakeholders, it is critical that project managers take adequate time to identify, understand, and manage relationships with all project stakeholders" (Schwalbe, 2006. p. 71). The global nature of 21st century projects must not deter the PMs from establishing the relationships with their stakeholders. If virtual interactions are not feasible, digital photos and a short bio can be distributed. It is imperative that project team members are well introduced, especially if there is distance between them to avoid any of the cultural barriers previously discussed, dissolving the notice that teams must be in the same location in order to work together effectively. Economically, the investment for communicating across space is substantially less than the funds required for building new office space. "Talent should reside where the work is primarily located, not where the headquarters are located" (Collins & Ernst & Smith, 2008, p. 35).

Sharing of information allows project management to become codified and more organized. Time management software allows team members to organize their information, checkout and update documents, and communication into one area. Schwalbe describes project communication management as one of the areas of project management knowledge, which "involves generating, collection, disseminating, and storing project information" (Schwalbe, 2006, p. 9). All team members are mutually accountable and must be updated of each others progress. List of issues encountered or resolved during the week should be distributed to keep global teams linked and knowledgeable, and working towards the common purpose.

Global Time Management

It has become easier to keep a team abreast of the current issues. Sharing of information is demanded at a faster pace; there is no longer the option of waiting for the mail or to reach the person over the phone. Email has given users the possibility of having immediate responses while being prepared to continuously work on the effort or multiple efforts.

On a global aspect of the global 21st century team, the project could be worked on the entire 24 hours due to team members working in different time zones. However, time zones must be respected, and meetings must be set bearing in mind the time zones for each individual team member. "It is important to provide guidance to all global stakeholders on when to organize a meeting by audio, video or web conferencing" (Binder, 2007. p. 91). The 21st century manager needs to be sensible to time management, especially with global teams. It has become increasingly easy to work at all hours with the introduction of blackberries and laptops. Although the project can not be free from the odd hours of working time, it is not mentally beneficial for long term success.

TECHNOLOGY IN PROJECT MANAGEMENT

When discussing project management technology in the 21st century, the most significant tool, software application, offers a multitude of options that have transformed the way program and PM's work. Applications which can objectively consolidate multiple projects, individual project tasks, deadlines, status reports and notifications are also now capable of assisting with training, retention of successful ideas in-house, and marketing power. Clearly these applications have the ability to improve a PM's productivity, but are they improving project success rates? Dating back to first Standish CHAOS report in 1994, technology project success rates have slowly increased over the last decade reaching 31% in 2003, an average increase of about 1.7 percent each year. On the present linear scale of improvement, the project success rate is expected to reach only 50% by 2014 (Marasco, 2006). Although projects are able to yield improved productivity, why are project success rates improving only 1.7% per year? Perhaps technology has advanced so fast over the last decade, particularly in the last few years, that program and PMs are either 1) failing to fully understand and implement software tools 2) selecting the wrong tools or 3) are simply having a difficult time keeping up with advancing technology.

Although the latest tools can elicit improvements in time management, status awareness, accountability, and profitability, as technology continues to change, program and PMs and their respective organizations have the option to learn and integrate new tools or stick with what processes they have. Some of the latest options can even unite ranged estimates with statistical analysis to determine the probability of completing a task or project by a certain date, resulting in a dynamic project schedule. Trying new PM tools may be the direction of the profession today; however, not if the profession is missing the fundamentals that should be practiced in the first place. There has to be a balance between the employed technology and the business itself. Nevertheless, many newer applications are now comprehensive PM web-based tools allowing seamless review and participation in project planning, documentation, follow-up, and executive review regardless of physical location. A new buzz-word on the horizon in project management, "unified communications" potentially combines telephone, email, data, and video conferencing with PM software; however, a lot of questions have to be answered before going down this road. No doubt innovation is good and inevitable, but business and IT leaders are thinking that innovation is moving faster than they can absorb in into their organizations (Weinstein, 2008).

Today, small and large businesses alike now have many options for software implementation; however, how should an organization select the tool that is best for them? For 15 years, R. Bird and Company Inc. had experimented with PM software tools. The biggest problem the company experienced was that the usability of the applications was so challenging that "no one would use them." (Blackwell, 2004). Before they identified a faster, more intuitive, and user-friendly online application, employee and client buy in was essentially absent. In fact, it wouldn't be surprising to see many companies small and large alike still using standard office productivity software, Excel, Word, et al to manage some aspects of their projects. Many large corporations invest millions of dollars in enterprise packages such as MS Project and VPMi, which likely includes extensive evaluation from their IT group, volume discounts as well as continued enterprise and IT department support. A limiting IT factor for some small businesses include the increased need for a network infrastructure, including servers for more data storage, security, and bandwidth, which are large capital investments. A new concept, Web-hosted software, is a money saver

because it frees businesses from having to shoulder the cost of buying computer servers and hiring a staff to maintain them (Cheng, 2008); however, some of these options are not as robust as more traditional platforms.

One key knowledge area for program and PMs in the 21st century is how to best evaluate their processes and preferred tools for each type of project. In 2006, a large survey of 750 experienced project management practitioners identified 8 functionalities in the top 20 which are often served by project management software; where the 3 most frequent usages were related to scheduling tools (Besner, 2008). Besner et al also state that project management appears to be going beyond the uniform generic description of project management, often by evoking differences among different project types and contexts. It seems the focus of evaluating and selecting of specific applications should target the best complement of tools, which most significantly addresses the organizational needs with regard to common project types. In addition, PMs dealing with external clients must understand not only their own organizational structure and business practices, but also those of the clients.

Although laptop computers are nothing new, Wi-Fi networks and cellular PC cards have taken mobile project management to a new level. Many options allow PMs to essentially take their tools into the field and manage projects remotely, approve orders, email stakeholders, and input data into web-based PM software anywhere they have a cellular signal. This has impacted construction PM's more than anyone. Generation Homes integrated its sales, scheduling and service management systems and added a wireless network connection that lets workers obtain and process information in real-time, allowing the instant transfer of information directly to operational and accounting systems thereby reducing its construction times from 130-145 days per home to an average of 110-120 days (Mello, 2007). Rapid real-time communication allows for improved efficiency with faster decisions, yielding fewer delays in reaching the next task, and lead to fewer uninformed decisions and assumptions, ultimately lowering costs. The overall project scope may stay in clear focus throughout the project life cycle with an enhanced communications infrastructure.

Program and project management practitioners need to understand how a business is run and how technology works and how to help align projects to strategic objectives. PMs bridge the gap between the business unit, IT unit, and executive perspectives (Haggerty, 2007). Haggery et al also described that over time, PMs help their organizations establish themselves with external clients and investors. This is made possible by allowing corporate governance to evaluate its organization by providing a methodology for measuring performance. The PM helps in the measurement process by communicating to executives how their project are helping meet strategic initiatives, which is eventually transferred to key stakeholders. The faster a PM can analyze and transfer project data or status reports for projects, the faster they can make executive decisions on the project, e.g. continue, discontinue, or prioritize another. These elements of project management should continue to influence more organizations, large and small alike, to evaluate and employ PM technology to improve project productivity and success rates. Advanced PM technology is a significant tool when trying to manage multiple projects, team members and stakeholders spread across an organization. Technology also has the potential to allow senior management to promote the centralization of operations and decision making (Tsai, 2003), which may be beneficial in today's horizontal organizational structures.

ORGANIZATIONAL STRUCTURE

After identifying the important skills and types of people needed to staff a project, the PM should work with top management and project team members to create an organizational chart for the project (Schwalbe, p. 169). Organizational structure is necessary for the PM to help determine the effectiveness and success of the company. Organizational Structure is believed by many to be the core of the company. Depending on its market, the structure of the company will help determine the likelihood of success. Organizational structure intervenes between goals and organizational accomplishments and thus influences organizational effectiveness. Structure affects how effectively and efficiently a PM coordinates group effort. To achieve its goals, an organization has to divide labor among its members and then coordinate what has been divided (Johns & Sacks, 2005). Different structures work entirely from one diverse setting to another making it more challenging for companies to decide whether or not their current structure needs revitalizing, and what type of structure they should consider or incorporate in the current structure. Many are set in the structures that have not adapted to the change in the worker increasing commitment to knowledge. About a half a century ago, Peter Drucker coined the term "Knowledge worker;" it was used to describe a new type of worker whose basic means of production was no longer capital, land, or labor but, rather the production of knowledge (Byrne, 1993). Today we call them professionals. Before tinkering with its organization chart, Ostroff says, a company must understand the markets and the customers to win them (Ostroff, 1992). Then the company can start to look into identifying the more critical core processes to reach their goals. Organization structure is a tool managers use to control resources to help them achieve organizational goals. Managers will have many responsibilities within the structures' makeup and will have to answer (Robbins, 2003):

- To what degree are tasks subdivided into separate jobs?
- On what basis will jobs be grouped together?
- To whom do individuals and groups report?
- How many individuals can a manager efficiently and effectively direct?
- Where does decision-making authority lie?
- To what degree will there be rules and regulations to direct employees and managers?

Vertical Structure

In every organizational structure you will have a person who is mainly the manager in authority. Authority is the legitimate right to make decisions and to tell other people what to do (Batemen-Snell, 2007, p. 264). Although it is not position dependent, authority requires that the manager report to the owner. Formal authority is a term used to describe when a boss gives an order and the lower-level complies or makes sure it gets done. In corporations, the stockholders are the owners. As we look at organizations, and recognize the authority is spread out over various levels, the issue of delegation becomes paramount. Delegation is perhaps the most fundamental feature of management, because it entails getting work done through others (Batemen-Snell, 2007, p. 266). The manager who wants to learn to delegate more should remember this distinction. If you are not delegating, you are merely doing things; the more you delegate, the more you are truly building and managing an organization (Bateman-Zeithaml, 1990). The

aspects of organizational structure are greatly influenced by the delegation capabilities of the manager. The traditional approach to corporate management views the organization as a collection of vertical departments or business units (Chang, 1993).

A few years back most of the corporate organizations were run under a vertical structure. A vertical structure in an organization practically gives all the power and decision-making to the executives at the top.   Corporate governance is a term describing the oversight of the organization by its executive staff and board of directors. Thanks to a few corporate scandals, Enron, ImClone, WorldCom, and Tyco, the public's trust in corporate governance and therefore vertical structure is diminishing in popularity. Management in a vertical organization is a bit more challenging in determining how smooth the operations will run.
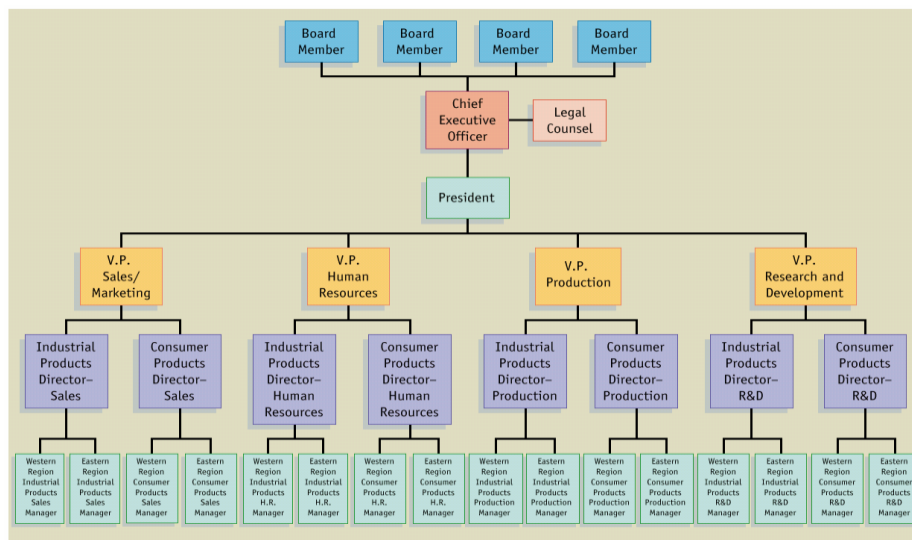

Figure 1. Organizational Chart (Stanford, 2004)

Horizontal Structure

The more complex the organizations the more departmentalized it will become. Departmentalization has 3 different approaches: functional, divisional and matrix. *The Horizontal Organization*, by institutional-change specialist Frank Ostroff, is a blueprint for the future development of public and private infrastructures that have outgrown the vertical, or "top-down," hierarchy that has been standard in the business community since the onset of the Industrial Revolution. "It is increasingly apparent that the long-favored vertical model is, by itself, no longer capable of meeting all the different needs of business," Ostroff writes. "It has been rendered inadequate for today's demanding competitive, technological, and workforce environments by its inherent shortcomings." The time is therefore right, he continues, completely to overhaul this outdated corporate structure and prepare for the next 50 years as some major establishments -- such as Ford Motor Company's Customer Service Division, Xerox, and the federal Occupational Safety and Health Administration (OSHA) -- already have done (Anarchy, website). The market place may have been more intolerant of the inefficiency of horizontal structure in the past, but it is now preferred by some because it is able to keep up with the current

competitive environment. "*Exactly what are the fundamental principles of the horizontal organization?"*

The twelve fundamental guiding principles for creating horizontal organizations according to Ostroff are the following:
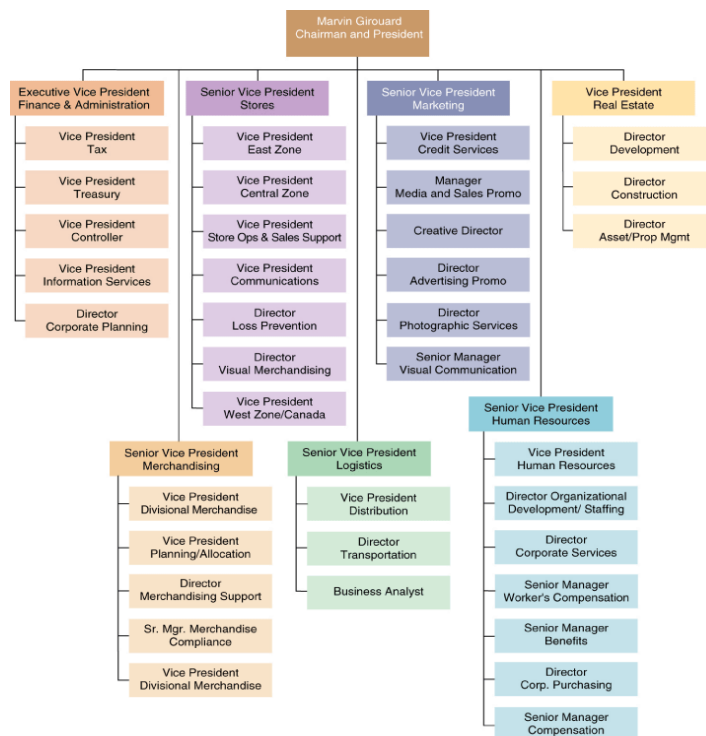The first five principles concern the design of the organization:
1. Organize around cross-functional core processes.
2. Install process owners
3. Make teams, not individuals, the cornerstone of organizational design and performance.
4. Integrate with customers and suppliers.
5. Decrease hierarchy by eliminating non-value-added work and by giving team members the authority to make decisions.

The next seven principles concern the institutionalization of the change:

6. Build a corporate culture of openness, cooperation, and collaboration, a culture that focuses on continuous performance improvement and values employee empowerment, responsibility, and well-being.
7. Empower people by giving them the tools, skills, motivation and authority they need.
8. Use information technology to help people reach performance objectives and deliver the value proposition to the customer.
9. Measure for end-of-process performance objectives as well as customer satisfaction, employee satisfaction, and financial contribution.
10. Redesign functional departments or areas to work as *partners in process performance* with core process groups.
11. Emphasize multiple competencies and train people to handle issues and work productively in cross-functional areas.
12. Promote multi-skilling, the ability to think creatively and respond flexibly to challenges that arise in the work that teams do.

All core processes lead to one end objective: Creating and delivering something of value to the customer (Ostroff, 1999). The principal benefit of horizontal management is that it facilitates smooth transition of intermediate products and services through the different functions to the customer. Companies facilitate this effectively by improving communication with their

employees, making them feel needed and empowered and lastly eliminating unnecessary work.

Figure 2. Functional Structure (Robbins, 2003)

Matrix Structure

In order to keep up with technology and the higher demand of product completion, many companies are looking into the matrix structure. A matrix management structure superimposes a horizontal program management over the traditional vertical hierarchy. The popularity of the matrix form waned during the end of the 1980's when many companies had difficulty implementing it (Bateman-Snell, 2007). Today, for organizations to keep up with the higher demand of product completion organizations must look for a change that will meet these demands of the 21st century; a matrix structure will meet that need. In today's environment of CIM, Automation, Lean, Six Sigma, Sustainability, and Work Force Empowerment the program manager must understand the practical applications for this structure. The program manager must be able to integrate these tools into an effective and competitive environment.

PMs are no longer limited to the four walls concept rather they are frequently finding themselves thinking outside the box. Global operations and sources require individuals with broad cultural knowledge and diverse language skills to work across time zones and maintain availability for meetings and conference calls around the clock every day of the week. It is no longer unusual for a PM to have a network of peers in Britain, Japan, Venezuela, Morocco, Eastern Europe and Indonesia, and other foreign countries across the globe. In today's Sarbanes- Oxley legislative umbrella, the PM has a high demand of ethical behavior and must do a lot more reporting than required in the previous centuries. Any mismanagement of the PM and the organization can have detrimental impact on the success of reaching the initial goals. Unfortunately, with the setup of the matrix structure, communication can still be a bit of a downer. Managers and staff personnel report to two bosses—a functional manger and a divisional manager (Bateman-Snell, 2007). The matrix structure involves having two lines of command. Not only will the employees have to report to the individual PM but they also have to report to the functional area manager. Confusion can arise because people do not have a single superior to whom they feel primary responsibility (Kolodny, 1981). Although there are a few disadvantages to using the matrix design structure, the advantages clearly makes it worth the challenge. To a large degree, problems can be avoided if the key managers in the matrix learn the behavioral skills demanded in the matrix structure (Bateman-Snell, 2007). Advantages of the matrix design (Kolodny, 1981):

- Decision making is decentralized to a level where information is processed properly and relevant knowledge is applied.
- Extensive communication networks help process large amounts of information.
- With decisions delegated to appropriate levels, higher management levels are not overloaded with operational decisions.
- Resource utilization is efficient because key resources are shared across several important programs or products at the same times.
- Employees learn the collaborative skills needed to function in an environment characterized by frequent meetings and more informal interactions.
- Dual career ladders are elaborated as more career options become available on both sides of the organization.

- Employees tend to be highly qualified, professional, & perform best in autonomous, flexible working conditions.
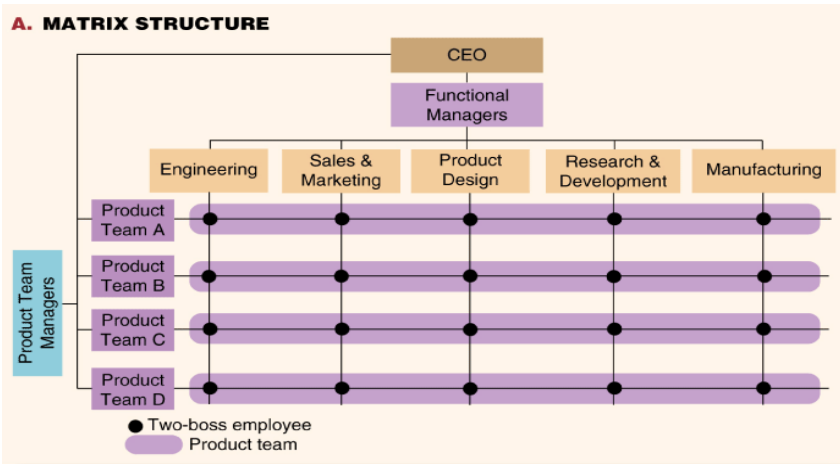

Figure 3. Matrix Structure (Robbins, 2003)

According to Bateman-Snell, employees working within the matrix structure, learn to be proactive, communicate effectively with both superiors, rise above the difficulties, and manage these work relationships constructively. As organizations move towards a more boundary-less 21st century, the need for PMs ability to share their expertise and knowledge becomes more demanding. Although managers may have plenty of experience as a project manager, most lack the knowledge necessary for a PM in the 21st century. Lack of knowledge will cause limitations not only for the organizations ability for success but also for PM's to maintain their position in the organization. In order to keep up with the 21st century organizational advancement demand, the need for additional education has opened a flood gate of PM's heading back to school.

EDUCATION/PROFESSIONAL DEVELOPMENT

For many years, PMs lacked formal training and education, certification, and professional organizations. "The only requirement was to get the job done" (Turk, 2007, p.22). As the business environment becomes even more competitive and complex, the 21st Century PM now faces increased educational and certification requirements worldwide along with the need to join professional organizations (Turk, 2007).

Certification

Professional certification for project management has significantly increased since the start of the profession, and continues to grow. PMP certification has grown from 1,000 in 1993 to over 500,000 in 2012 (PMI, 2012). There are two main certifications for project management which are provided by the Project Management Institute (PMI): Project Management Professional (PMP) and the Certified Associate in Project Management (CAPM).
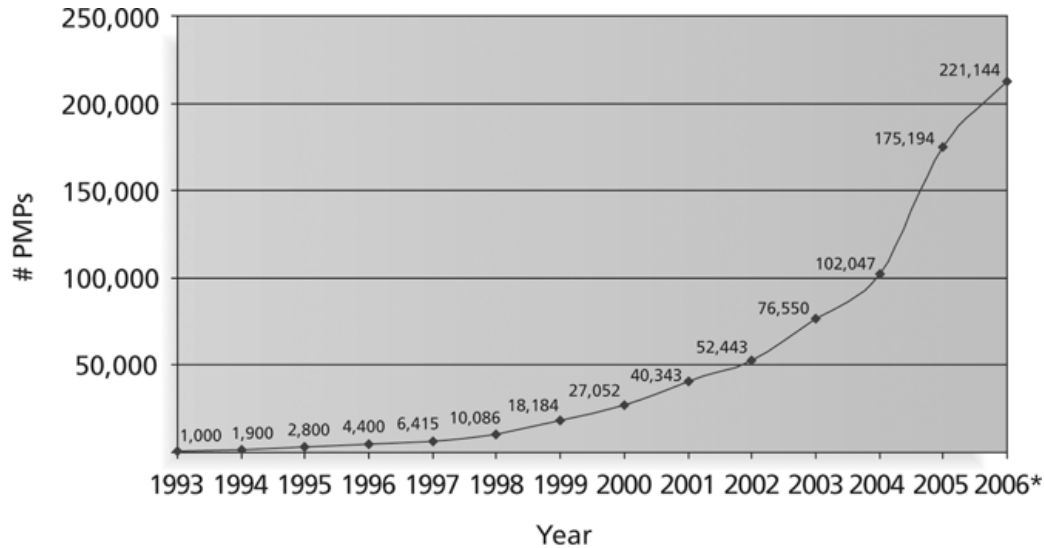
*As of December 31, 2006

Figure 4. Growth in PMP Certification, 1993-2006 (Schwalbe, 2006)

CAPM certification is designed for project team members. This paper focuses on the PMP certification which is now recognized as the "gold standard;" (Turk, 2007).

PMP certification recognizes someone who has documented sufficient project experience and education, agreed to follow the code of ethics and professional conduct, and demonstrated knowledge of the field of project management by passing a comprehensive examination. According to the PMI, The following requirements must be met to be eligible for certification:
1) Applicants must have 35 hours of specific project management education; 2) With a Bachelor's Degree (or the global equivalent): Applicants must have a minimum of three years professional project management experience, during which 4,500 hours are spent leading and directing project tasks, up to eight years from the time of application; and 3) Without a Bachelor's Degree (or the global equivalent): Applicants must have a minimum of five years professional project management experience, during which at least 7,500 hours are spent leading and directing project tasks, up to eight years from the time of application. The exam is four hours long and is composed of 200 multiple choice questions (Project Management Institute [PMI], 2007).

Many organizations worldwide now require PMP certification for PMs (Schwalbe, 2006). Certification requirements are now global; countries such as "Australia, Canada, Japan, and the United Kingdom are on the certification bandwagon." (Turk, 2007) For example, certification is now required in India for all engineers and officers who oversee large government projects in an attempt to curb budget and schedule problems (PM Network 2005). Some companies also offer certification courses; IBM Systems and Technology Group have the Project Management Center of Excellence program to help employees become IBM-certified PMs (PM Network 2007). Certification is now an essential credential for PMs in the 21st Century to secure positions with employers.

Advanced Degrees/Accredited Programs

There are 15 institutions worldwide with multiple accredited degree programs (listed on pmi.org) that have undergone review by PMI's Global Accreditation Center (GAC). The majority of programs are at a master's level (MBA, MA, MSc, etc) with some certificate and doctoral programs (Thomas & Mengel, 2008). Completing a GAC accredited program meets 1,500 hrs (out of 4,500 required) of project management experience which is required to sit for the PMP exam. Additional programs in Australia, Costa Rica, Ireland, Scotland, South Africa, United Arab Emirates, and the United States are candidate degree programs and are in the process of being accredited by the PMI Global Accreditation Center (GAC) (PMI, 2007).

Unfortunately, research shows that project management programs focus on transferring "know-how" through traditional educational methods, and do not prepare PMs to deal with the increasing complexities of today's unpredictable environment. Thus, there is a gap between what education offers and what is actually needed to successfully manage projects (Thomas & Mengel, 2008). "Educators must move away from the delivery of standard package solutions and techniques-orientated pedagogy to learning and development which facilitates the development of reflective practitioners who can learn, operate, and adapt effectively in complex project environments" (Berggren & Soderlund, 2008, p. 287).

Professional Organizations

In addition to receiving certification and accredited degrees, PMs are encouraged to be actively involved in professional organizations. Organizations such as the Project Management Institute, Students of Project Management, International Association of Project and Program Management, and Association for Project Management are just a few reputable organizations that PMs can join. Professional organizations provide networking opportunities where PMs can share best practices. Continuous training and seminars with industry leaders are also offered to aid career advancement. Furthermore, these organizations provide valuable up-to-date information and resources which are essential to the 21st century PM. (Turk, 2007; Shetsky, 2008; PMI, 2007; Students of Project Management, 2007; International Association of Project and Program Management, 2004; Association for Project Management).

KNOWLEDGE MANAGEMENT (KM) COMPETENCE

Knowledge management ("KM") is the final issue this paper explores; it is a growing concern for 21st century PMs as they are challenged with managing knowledge from increasingly complex projects. Hildebrand (2007) states that part of a PM's role is to enhance and share knowledge. Knowledge practices influence the success of projects (Reich & Wee, 2006) and are crucial to efficient and effective project management (Ajmal & Koskinen, 2008). Effectively managing project knowledge affects the quality of decision making, which impacts quality, time, and cost parameters, and thus project performance (Brookes et al, 2006). Unfortunately, many organizations fail to practice effective knowledge management; therefore, organizations do not effectively appraise projects and learn from them which results in repeated errors (Kasvi, et al, 2003). The storage and accumulation of knowledge, the content and quality of knowledge, the ability to utilize knowledge, and knowledge transfer are just a few issues for contemporary

organizations and PMs (Kasvi, et al, 2003). This paper will first define project management knowledge and then discuss KM issues.

Project Management Knowledge Defined

Project management knowledge ("PMK") is composed of several aspects. It is "knowledge within the profession of project management including knowledge about the project management processes in use during the project" (Reich & Wee, 2006, p. 13). As a potential output of a project, it consists of 1) technical knowledge, 2) procedural knowledge, and 3) organizational knowledge related to communication and collaboration (Kasvi et al, 2003). Furthermore, project knowledge is composed of the "shared knowledge of project team members" (Koskinen, 2004).

PMK can also be broken down into explicit and tacit knowledge, as well as fundamental knowledge areas. Explicit knowledge refers to why things work, implies factual statements, and is easily communicated. Tacit knowledge is about what things work; it is attitudes, intuitions, uncodified routines, and is based on the experience of individuals (Koskinen 2004). There are nine project management knowledge areas which are recognized as key competencies for PMs: project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management, project procurement management, and project integration management (Schwalbe, 2007). These nine areas are included in PMI's Project Management Body of Knowledge Guide and are competency standards of PMI's certification program (Morris, 2001).

KM Strategies

There are two established strategies for managing knowledge: codification and personalization. Codification refers to codifying knowledge and storing it in artifacts and computer databases where it can be accessed. Personalization refers to knowledge developed by persons and shared with personal interaction. In this strategy, computers are used to help communicate knowledge and not store it (Koskinen 2004). Kasvi et al (2003) found that organizations used paper documents (codification) and interaction with colleagues (personalization) as the most important knowledge sources. Computer files were also used to accumulate and store knowledge. However, knowledge was not systematically stored; accumulation, storage, and documentation systems were all unsystematic and web pages with project documents were also not fully utilized.

Hildebrand (2007) discusses the need for a common framework and taxonomy for categorizing knowledge and standardized approaches to prevent disparate approaches and results, as well as difficulty in finding and sharing knowledge. She suggests that organizations create a knowledge management plan that outlines: 1) information that would help the team delivers the project, 2) where the knowledge can be found, 3) how it can be accessed, and 4) who will take accountability for finding and using that knowledge. For example, NASA has requirements across all projects that capture lessons learned and archives knowledge using agency-wide systems. PMs can then choose their own knowledge management tools and methods such as web tools or case studies. Because people communicate in a variety of ways, organizations must also

use different communication channels and knowledge sharing tools. NASA utilizes databases, web portals, off-site forums, and a published magazine.

Knowledge Transfer and Organizational Culture

Transferring knowledge and lessons learned prevent PMs from "inventing" tools that can be learned from each other, and can also put organizations at a competitive advantage (Eskerod & Skriver, 2007). However, organizational culture can constrain or facilitate knowledge creation and transfer as it determines how decisions are made through established systems and practices (Ajmal & Koskinen, 2008). Knowledge can be transferred at an individual, group, and organizational level. Ajmal & Koskinen (2008) discuss how an organization's culture is one of the biggest obstacles to knowledge transfer among these levels. Holding information seems to be more important than sharing it. Organizations lacking an effective managerial support structure do not experience benefits from investing in knowledge management.

"The project manager has a crucial role in creating a team culture that facilitates the development of project goals and group norms with respect to decision making, conflict resolution, and so on" (Ajmal & Koskinen, 2008 p.12). PMs are challenged with dealing with multiple cultures inside and outside the organization. For knowledge to be effectively managed, organizations need to foster a culture that facilitates and encourages the creation, sharing, and utilization of knowledge (Ajmal & Koskinen, 2008).

Organizations are now focusing on building a community of learning and sharing knowledge. Paul Ritchie, PMP, head of global project management operations at SAP AG in Walldorf, Germany mentioned how he recruits experienced PMs as global knowledge management moderators to lead and advocate project management efforts. "To truly capitalize on knowledge management, companies must build a learning-focused environment that spans the enterprise" (Hildebrand, 2007).

IMPLICATIONS FOR THEORY AND PRACTICE

Implications For Theory

What could be done to help accelerate the evolution of management in the years to come? Naturally more time and research are required to fully understand the 21st century's demands. Successful managers will be those where strategy is based on change and continuous improvement. It is crucial for PM's to accept and work with change. The rate of change is rapidly increasing due to the issues that have entered the new century. Globalization brings more opportunities and more competition. Continual improvements in technology and communication will call for non-stop innovation to retain competitive advantage.

Future research pertaining to technology affecting today's project managers should not be limited to the available options and features and how these tools can aid in managing the triple constraint. Critical Chain Project Management as described by Professor Goldratt and "Systems Thinking" and "System Dynamics" in Project Management as described by Dr. John Sterman and Dr. Jay Forrester, agile project management methodologies, simulation modeling, and so

forth. A broader scope includes evaluation and selection of the right platform(s) to best meet organizational needs and according to the types of projects the organization typically engages in. Data show that technology is widespread among PM's, but success rates continue to show minimal improvement. This may be due to the apparent lack of successful integration with existing business infrastructures or incomplete or unsupported integration altogether. Understanding the limitations of existing technology infrastructures is a critical decision making process lying ahead for PM's to carefully investigate technology options today and what may be available tomorrow, to plan for the long term.

Global demands of communication, products, and networks add to the complex challenges of today's operations. To meet these needs, organizations are left with a desire to fit the demand with other waves of structures for the future. It is not enough to create a flexible organization merely by changing the structure. To create an environment that allows information to flow freely throughout the organization, managers must also attend to the norms, values, and attitudes that shape how people within their organizations behave (Bateman-Snell, 2007).

Research has shown the shift towards increased education and professional development requirements for PMs in the 21st century. There is no doubt that more organizations are requiring certifications. However, education and certification are not the only requirements in today's business environments as it is shown to be ineffective in preparing PMs for highly complex and unpredictable situations. Further research should explore how to prepare PMs for these complex situations and how certification programs and professional organizations can improve training for PMs to effectively adapt to complex environments.

KM is a fairly new area of research that has not been fully explored. Research has shown the lack of effective KM in 21st century organizations as well as the need for effective KM systems. Research has also shown that KM affects project performance and success. KM should be further explored and studied in various organizations to improve strategies and methods to effectively store, accumulate, utilize, and transfer knowledge. More research is also needed to find ways to stress to organizations the importance of having a culture that values KM and knowledge transfer.

Implications for Practice

21st Century PMs must understand that projects may include offsite members that may have a different working environment. Mangers will have to learn to communicate with cross-culture teams while continuing to maintain the successful progress of the project. "Effective managers will continuously improve their technical skills and ability to interact with people from a variety of cultures as members of teams in virtual organizations (Francesco & Gold, 1998, p. 254).

Today's business environment is in need of educated and certified PMs who are actively involved in professional organizations. PMs need to continuously learn from industry leaders and take advantage of the wealth of information available to aid career advancement, and increase knowledge and skills to become more effective in the workplace. The 21st century organization is moving towards requiring certified PMs. Thus, PMs and future PMs will need to obtain certification to remain valuable to organizations.

KM is a complex issue and many organizations do not realize how crucial it is to effectively store, accumulate, utilize, and transfer knowledge. PMs need to pursue systems and methods to manage the plethora of knowledge that goes in and comes out of projects. Organizations need to move toward a culture that embraces knowledge transfer and management. Projects are becoming more complex and managing this knowledge is crucial to project success.

CONCLUSION

21st Century PMs must prepare themselves for the increasingly complex business environment and unseen future of project management by ensuring that they are involved with global collaboration, up to date education and technology, knowledge management issues, and understand the core of an organization. PMs must acknowledge and welcome new tools and trends, as well as, understand the comprehensive business processes and complex reporting structures that impact work. Businesses are changing rapidly in today's economy and change depends heavily on successful project management. Technology of the future and the high demands of customer satisfaction has influenced most of the changes affecting project management that have been underway for several years under the disguise of total quality management effort, engineering, or business process redesign. The technology and knowledgeable business trend has PMs managing across structure rather than managing up and down in a top-heavy industry. Ostroff states, a company must understand the markets and the customers it wants to reach and complete an analysis of what it will take to win them (Byrne, 1993).

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