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What Successful Project Managers Do

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Traditional approaches to project management emphasize long-term planning and a focus on stability to manage risk. But today, managers leading complex projects often combine traditional and "agile" methods to give them more flexibility — and better results.

In today's dynamic and competitive world, a project manager's key challenge is coping with frequent unexpected events. Despite meticulous planning and risk-management processes, a project manager may encounter, on a near-daily basis, such events as the failure of workers to show up at a site, the bankruptcy of a key vendor, a contradiction in the guidelines provided by two engineering consultants or changes in customers' requirements.[1] Such events can be classified according to their level of predictability as follows: events that were anticipated but whose impacts were much stronger than expected; events that could not have been predicted; and events that could have been predicted but were not. All three types of events can become problems that need to be addressed by the project manager. The objective of this article is to describe how successful project managers cope with this challenge.[2]

Coping with frequent unexpected events requires an organizational culture that allows the project manager to exercise a great amount of flexibility. Here are two examples of advanced organizations that took steps to modify their cultures accordingly.

A group of 23 project managers who had come from all over NASA to participate in an advanced project management course declared mutiny. They left the class in the middle of the course, claiming that the course text, based on NASA's

standard procedures, was too restrictive for their projects and that they needed more flexibility. With the blessing of NASA's top leadership, the class members then spent four months conducting interviews at companies outside of NASA. This led to a rewriting of numerous NASA procedures. Among other things, NASA headquarters accepted the group's recommendation to give NASA project managers the freedom to tailor NASA's standard procedures to the unique needs of their projects. A similar movement to enhance project managers' flexibility occurred at Procter & Gamble, where the number of procedures for capital projects was reduced from 18 technical standards and 32 standard operating procedures to four technical standards and four standard operating procedures.

Concurrent with these changes at NASA and P&G, a heated debate emerged within the wider project management profession regarding the need for flexibility, as opposed to the traditional approach, which emphasizes that project success depends on stability. According to the traditional approach, project success can be achieved by focusing on planning and on controlling and managing risks. Although the popularity of this approach has sharply increased across industries, research covering a wide variety of projects consistently reveals poor performance. A large percentage of projects run significantly over budget and behind schedule and deliver only a fraction of their original requirements.[3]

THE FOUR ROLES OF THE PROJECT MANAGER

The Four Roles of the Project Manager

Our research found that today's successful project managers assume four roles that help them cope with unexpected events.

ROLE	DRIVEN BY	TIMING	KEY ACTIVITIES
Develop collaboration	Intention	Initially	•Select the right people •Develop mutual interdependence and trust
Integrate planning and review with learning	Intention	Periodically	•Develop stable short-term plans and flexible long-term plans •Conduct learning-based project reviews
Prevent major disruptions	Events	Occasionally	•Anticipate and cope proactively with a few major problems
Maintain forward momentum	Events	Continuously	•Resolve problems by hands-on engagement •Update and connect through frequent face-to-face communication •Move about (walk the floor) frequently

The other side in this debate is best represented by a newer project management approach popular within the software industry. Called the agile method, it asserts that project success requires enormous flexibility throughout the project's life. However, even proponents of the agile approach acknowledge that this approach is best suited to small projects and teams.[4]

Our studies, employing experiential data collected from more than 150 successful project managers affiliated with more than 20 organizations, indicate that today's successful project managers cope with unexpected events by a combination of the traditional and agile approaches, assuming four roles. (See "About the Research.") Two of the roles are intention-driven and two are event-driven, with each role assumed on its own time schedule throughout the life of the project. The first role, developing collaboration, is performed early on during the project. The second role,

integrating planning and review with learning, is performed periodically. The third role, preventing major disruptions, is performed occasionally. The fourth role, maintaining forward momentum, is performed continuously.[5] (See "The Four Roles of the Project Manager.")

About the Research

In recent years, many researchers have concluded that one reason for the widespread poor statistics about project results is the wide gap between research and practice.[i] The overall objective of our research was to develop a practice-based theory of project management.[ii] To this end, we used three complementary approaches to collect firsthand data on the practices of successful project managers. Believing that management is best learned by emulating exemplary role models, we focused our studies on a selective sample of the best practitioners in their respective organizations.

Our first approach consisted of field studies and structured research tools, particularly 40 interviews (two to four hours each) and 20 observations (four hours to a week each) of practitioners in the following organizations: AT&T, Bechtel (the San Francisco-based construction and civil engineering company), DuPont, General Motors, IBM, Motorola, PPL Electric Utilities (an electric utility company based in Allentown, Pennsylvania), Procter & Gamble and Turner Construction Company (a construction services company headquartered in New York City).

For our second approach, we convened project teams and facilitated reflective dialogues in which participants shared their stories and practices from recent projects. We collected most of the cases, stories and practices through our role as the facilitators of the project management knowledge-development and -sharing communities in three organizations.[iii] In this capacity, Laufer and Hoffman worked for five years with NASA, Laufer and Cameron worked for three years with P&G and Laufer and Russell worked for two years with Boldt (a construction services company based in Appleton, Wisconsin). Project managers from the following organizations participated in these community of practice meetings: AeroVironment (a technology company based in Monrovia, California), Boldt, The Johns Hopkins University Applied Physics Laboratory, Lockheed Martin, NASA, Procter & Gamble, Raytheon and the U.S. Air Force.[iv]

To make sure that the principles we developed were a valid interpretation of the stories we had collected, we adopted a third approach — testing our interim results in real-life situations. Through consulting engagements with four project-based organizations — Boldt, Parsons Brinckerhoff (the multinational engineering and design firm headquartered in New York City), Skanska (the Scandinavian construction and property development group) and Turner Construction — we validated and refined our understanding and developed the four-role framework presented in the current article. We then tested and refined this framework in our work with the Boldt project management knowledge-development and -sharing community. The model presented in this article is the result of a final refinement process, which included a series of interviews with 10 project managers and 10 senior managers. We held these interviews (two to three hours long) with a carefully selected group of practitioners from companies that represented a variety of industries, including Cedars-Sinai Medical Center, NASA, PricewaterhouseCoopers, P&G and the U.S. Air Force.

1. Develop Collaboration

Since project progress depends on the contribution of individuals who represent different disciplines and are affiliated with different parties, collaboration is crucial for the early detection of problems as well as the quick development and smooth implementation of solutions. The importance of collaboration can be demonstrated by the following two examples in which projects failed.

Tim Flores analyzed the causes for the different outcomes of three Mars exploration missions initiated by NASA's Jet Propulsion Laboratory: Pathfinder, Climate Orbiter and Polar Lander. Although all three projects were conducted under the same guiding principles, were of comparable scope and shared many elements (even some of the same team members), Pathfinder was a success, whereas the other two missions failed. Flores expected to find that the Pathfinder project differed from the other projects in a variety of factors, such as resources, constraints and personnel. Although this was true to some extent, he found that the primary factor distinguishing the successful mission from the failed missions was the level of collaboration. The Pathfinder team developed trusting relationships within a culture of openness. Managers felt free to make the best decisions they could, and they knew that they weren't going to be harshly punished for mistakes. That trust never developed in the other two projects.[6]

A different NASA project, the Wide-Field Infrared Explorer (WIRE) mission, was designed to study the formation and evolution of galaxies. Its telescope was so delicate it had to be sealed inside a solid hydrogen cryostat. When, shortly after launch, a digital error ejected the cryostat's cover prematurely, hydrogen was discharged with a force that sent the Explorer craft tumbling wildly through space, and the mission was lost.

Jim Watzin, a project manager at NASA and a member of the WIRE project team, had this to say regarding the official report that NASA issued following the WIRE failure: "WIRE failed because people could not or would not communicate well with each other. … Individuals ... simply were uncomfortable allowing others to see their work." Watzin added: "The real [lesson] from this loss is that any team member that does not participate as a true team player should be excused [from the project]."[7]

In the next two examples, project success can be attributed to the project manager's deliberate attempt to develop collaboration. (Note that in the discussions that follow, we use only the project managers' first names.)

Allan, the payload manager for NASA's Advanced Composition Explorer project at the Jet Propulsion Laboratory, has described how he developed trust between his team and the 20 groups of scientists developing instruments for the project, who were based at universities throughout the United States and Europe. Allan devised a three-stage plan. First, he selected team members who could operate in a university environment — people who knew when to bend or

even break the rules. Second, he relocated his JPL team to a university environment (California Institute of Technology), recognizing that it might be difficult to develop an open, flexible culture at JPL. Third, he came up with an uncommon process for interacting with the scientists.[8]

The challenge, with regard to interaction, was getting the scientists to regard his JPL team as partners. Having dealt with NASA before, they tended to believe that someone coming from JPL would demand a lot of paperwork, lay out sets of rules to be followed and expect things to be done a certain way. In fact, many of the scientists weren't sure they should share with Allan's team the problems they were encountering along the way — problems that could slow down the project's progress.

When unexpected events affect one task, many other interdependent tasks may also be quickly impacted. Thus, solving problems as soon as they emerge is vital for maintaining work progress.

The primary role of Allan's team was to review the development of the instruments, and Allan believed that the best way to do this was by focusing on trust and convincing the scientists that his team was there to help them solve their problems. To facilitate this, Allan and his team of five to eight members traveled to each university and stayed on site for an extended period of time. By spending days and nights with the scientists and helping them solve their problems — not as auditors but as colleagues — the JPL team gradually became accepted as partners.[9]

Most projects are characterized by an inherent incompatibility: The various parties to the project are loosely coupled, whereas the tasks themselves are tightly coupled. When unexpected events affect one task, many other interdependent tasks are quickly affected. Yet the direct responsibility for these tasks is distributed among various loosely coupled parties, who are unable to coordinate their actions and provide a timely response. Project success, therefore, requires both interdependence and trust among the various parties.[10]

However, if one of the parties believes that project planning and contractual documents provide sufficient protection from unexpected problems, developing collaboration among all the parties may require creative and bold practices.

This was the case in a large construction project that P&G launched at one of its European plants. After the contractor's project manager, Karl, brushed off numerous team-building efforts, Pierre, the P&G project manager, finally found an opportunity to change Karl's attitude. Three months into construction, the contractor accidentally placed a set of foundations 10 inches inside the planned periphery and poured about 600 lineal feet of striped foundation in the wrong place. Instead of forcing the contractor to fix his mistake and start over — a solution that

would have damaged the contractor's reputation and ego — Pierre chose a different approach. Through several intensive days of meetings and negotiations with the project's users and designers, he was able to modify the interior layout of the plant, thereby minimizing damage to the users without having to tear down the misplaced foundations and hurt the project's schedule. The financial cost of making the changes incurred by the contractor's mistake was significant, but the loss in reputation was minimal. As a result, Karl gradually embraced Pierre's working philosophy — namely, "If they fail, we fail." The realization that the organizations involved in the project are all interdependent led to the development of a collaborative relationship.

2. Integrate Planning and Review With Learning

Project managers faced with unexpected events employ a "rolling wave" approach to planning. Recognizing that firm commitments cannot be made on the basis of volatile information, they develop plans in waves as the project unfolds and information becomes more reliable. With their teams, they develop detailed short-term plans with firm commitments while also preparing tentative long-term plans with fewer details. To ensure that project milestones and objectives are met, these long-term plans include redundancies, such as backup systems or human resources. [11]

One key difference between the traditional planning approach, in which both short- and long-term plans are prepared in great detail, and the rolling wave approach becomes evident when implementation deviates from the plan. In the traditional planning approach, the project team attempts to answer the question: Why didn't our performance yesterday conform to the original plan? In the rolling wave approach, project managers also attempt to answer the question: What can we learn from the performance data to improve the next cycle of planning? In particular, they attempt to learn from their mistakes — to prevent an unexpected event from recurring. [12]

Successful project managers do not limit the learning process to the planning phase but also use it for project reviews. For example, after a review session in the midst of a project at NASA's Goddard Space Flight Center, Marty was a frustrated project manager. The existing review process may have fulfilled upper management's need to control its operations, but Marty felt it did not fulfill his team's need to learn. Therefore, he modified the process to give his team the best input for identifying problems and the best advice for solving them. This meant doing away with the usual "trial court" atmosphere at NASA review sessions, where team members' presentations were often interrupted by review board members' skeptical comments and "probing the truth" questions. In its place, Marty developed a review process that provided feedback from independent, supportive experts and encouraged joint problem solving rather than just reporting.

The first thing Marty did was unilaterally specify the composition of the review panel to fit the unique needs of his project, making sure that the panel members agreed with his concept of an effective review process. The second thing he did was change the structure of the sessions, devoting the first day to his team's presentations and the second day to one-on-one, in-depth discussions between the panel and the team members to come up with possible solutions to the problems identified on the first day. This modified process enabled Marty to create a working climate based on trust and respect, in which his team members could safely share their doubts and concerns. At the end of the second day, the entire panel held a summary meeting. It was agreed that the review session had been a big success. In fact, other NASA project managers quickly adopted Marty's process, including it in their managerial tool kits. [13]

Successful managers of more traditional projects, such as designing and building manufacturing facilities, also practice learning-based project reviews. P&G has replaced review panels composed of external experts or senior managers with peer-review panels. These last four to eight hours and follow a simple protocol: First, the project team concisely communicates its technical and execution strategies, and then the floor is opened to all the invited peers for comments, critique and clarifying questions. Out of the numerous notes documented throughout the review process, five to 10 "nuggets" usually emerge that the project team uses to improve the technical, cost and scheduling aspects of the project. Sometimes, the invited peers even take one or two of the "nuggets" back to their own projects. [14]

3. Prevent Major Disruptions

In their book *Great by Choice*, Jim Collins and Morten T. Hansen describe one of the core behaviors of great leaders as "productive paranoia." Even in calm periods, these leaders are considering the possibility that events could turn against them at any moment and are preparing to react. [15] Similarly, successful project managers never stop expecting surprises, even though they may effect major remedial changes only a few times during a project. They're constantly anticipating disruptions and maintaining the flexibility to respond proactively. [16] The following two examples illustrate that, when convinced that a change is unavoidable, a successful project manager acts as early as possible, since it is easier to tackle a threat before it reaches a full-blown state.

NASA's Advanced Composition Explorer project, discussed earlier, was plagued from the start with severe financial problems arising from internal and external sources. Internally, the development of the nine scientific instruments led very quickly to a $22 million cost overrun. Externally, the project, which was part of a larger NASA program, inherited part of a budget overrun in an earlier project. As a result of these internal and external factors, the ACE project experienced frequent work stoppages, forcing the manager to constantly change his contractors' and scientists' work priorities.

Don, the project manager, believed that without immediate changes the project would continue down the same bumpy road, with the likely result that cost and time objectives would not be met. To prevent this, he made an extremely unpopular decision: He stopped the development of the instruments, calling on every science team to revisit its original technical requirements to see how they could be reduced. In every area — instruments, spacecraft, ground operation, integration and testing — scientists had to go back and ask such questions as: How much can I save if I take out a circuit board — and how much performance will I lose if I do take it out?

At the same time, Don negotiated a new agreement with NASA headquarters to secure stable funding. To seal the agreement, he assured them that, by using descoping tactics, the project would not go over budget. With the newly stable budget and the project team's willingness to rethink its technical requirements, the ACE project gradually overcame its technical and organizational problems. Completed early and below budget, the spacecraft has provided excellent scientific data ever since.

The second example of preventing a major disruption from occurring took place during the Joint Air-to-Surface Standoff Missile, or JASSM, project. In this case, the Pentagon had decided to make another attempt to develop

JASSM after the first attempt was aborted due to a cost overrun of more than $2 billion. The original project manager for the second attempt was dismissed in midcourse due to poor performance, and a new project manager, Terry, replaced him.

To keep costs under control, Terry decided to have two contractors compete for the final contract. Terry quickly realized that both contractors were approaching the development too conservatively and that unless he took a more radical approach, the project would be canceled again. Therefore, he told the contractors to completely disregard the military standards and adhere to only three key performance parameters. One of the contractors, Lockheed Martin, took this directive seriously and changed its approach dramatically. It decided to build the missile fuselage not out of metal but out of composites. And to accomplish this, it found a company that made baseball bats and golf club shafts. The company had never built a military product, but it knew how to weave carbon fiber and was open-minded. Following trials with several prototypes, this company was able to manufacture a product of the highest quality. Lockheed Martin transformed this small company from a baseball bat provider to a cruise missile supplier, which led to Lockheed Martin winning the contract — as well as to remarkable cost reductions.

4. Maintain Forward Momentum

As noted earlier, when unexpected events affect one task, many other interdependent tasks may also be quickly impacted. Thus, solving problems as soon as they emerge is vital for maintaining work progress. As Leonard R. Sayles and Margaret K. Chandler wrote in their 1971 book *Managing Large Systems*, “In working to maintain a forward momentum, the manager seeks to avoid stalemates. ... Another penalty for waiting is that in a good many situations, corrective action is possible only during a brief ‘window.’ … The heart of the matter is quickness of response.” In a study of project managers on construction sites, it was found that they addressed (not necessarily solved) 95 percent of the problems during the first seven minutes following problem detection.[17]

In a recent knowledge development meeting, a group of 20 project managers at The Boldt Company, a construction services company based in Appleton, Wisconsin, focused on how best to cope with unexpected events. It became evident that most of the managers employed three complementary practices: hands-on engagement; frequent face-to-face communication; and frequent moving about.

Regarding hands-on engagement, one project manager, Charlie, said that to solve problems he often engaged in activities such as making phone calls, convening urgent meetings and taking trips to local retail stores to purchase missing parts. Documenting the time it took him to resolve 10 recent problems, Charlie reported that three were resolved within 30 minutes, three within 60 minutes, and three in less than one day; one problem took two days until it was resolved. Charlie also said that, because of his quick responses, he made one mistake. However, he was able to quickly repair its damage the following day. The entire group at Boldt agreed that maintaining forward momentum

was more important than always being right.[18]

The second practice, frequent face-to-face communication, was described by Matt, one of the project managers, in terms of "daily 10-minute huddles" with all the on-site team members (the superintendent, field engineers, project coordinator and safety officer). Matt used these informal morning meetings to share the latest instructions from the client and to ensure that team members understood one another's current workloads and constraints and understood how they could help one another. Very often, the meetings enabled the team to identify and resolve conflicting priorities before they became problems. Matt noted that, while the primary purpose of the huddle was to update everyone, it also reinforced a spirit of camaraderie and a sense of shared purpose. As a result, these meetings turned out to be very valuable for sustaining teamwork.[19]

As for the third practice, frequent moving about, one project manager, Tony, described the three primary outcomes of spending 30 minutes a day roaming around the project site. First, he was able to develop rich and open communication with his team members. Tony explained that while many workers did not feel safe asking him questions during various formal meetings, they felt very comfortable interacting with him freely during his on-site visits, which had a great impact on their motivation. Second, receiving immediate information, and in particular a greater range of information, enabled him to identify problems early on. At times, he was able to detect conflicts before they actually became an issue. Third, Tony developed a much better understanding of where the project was with respect to the schedule, rather than having to take someone's word for it. He found that coming to the weekly and monthly planning and scheduling meetings equipped with firsthand, undistorted information allowed him to address questions and solve problems much better. The Boldt project managers did not agree on the preferred timing for moving about and, in particular, whether one should schedule the visits, as Tony did, or leave their timing flexible. However, they all agreed that moving about is a most effective practice that should be applied as often as possible.[20]

These three practices are not limited to construction projects. For example, in the previously mentioned JASSM project, which was geographically dispersed, all three practices necessary to maintain forward momentum were employed by the various project managers at each production site. Additionally, Terry, the customer's project manager, spent much of his time moving about between all the different production sites.

Implications for Senior Managers

Although every project manager tries to minimize the frequency and negative impact of unexpected events, in today's dynamic environment such events will still occur. Acknowledging the emergence of a problem is a necessary first step, allowing the project manager to respond quickly and effectively. Some organizations assume that almost all problems can be prevented if the project manager is competent enough — resulting in project managers who are hesitant to admit that they are facing an emerging problem. In fact, a recent study indicates that project managers submit biased reports as often as 60 percent of the time.[21] When upper management fosters an organizational climate that embraces problems as an inherent part of a project's progression, project managers are able to detect and resolve problems more successfully.

Management scholar Henry Mintzberg argues that today's managers must be people-oriented, information-oriented and action-oriented. In contrast, the two prevailing project management approaches, the traditional approach and the

agile approach, do not require project managers to encompass all three orientations. The traditional approach (primarily intention-driven) stresses information, whereas the agile approach (primarily event-driven) stresses people and action.

By assuming the four roles discussed in this article, the successful project managers we studied are both intention- and event-driven and embrace all three orientations. Developing collaboration requires them to be people-oriented. Integrating planning and review with learning requires them to be information-oriented. Preventing major disruptions requires them to be action-oriented. Finally, maintaining forward momentum, which is pursued throughout a project, requires them to adopt all three orientations. Senior managers must ensure that all three orientations are considered when selecting project managers and developing project management methodologies.[22]

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ii. M.S. Feldman and W.J. Orlikowski, "Theorizing Practice and Practicing Theory," Organization Science 22, no. 5 (September-October 2011): 1240-1253; and S. Tengblad, ed., "The Work of Managers," 337-354. Our research approach was influenced in many respects by management scholar Henry Mintzberg's approach. That includes viewing management as a practice (not as a profession) and stressing the use of systematic observations of managers. In particular, it involves the use of "rich description," about which Mintzberg writes: "I need to be stimulated by rich description. … Tangible data is best … and stories are best of all. …Anecdotal data is not incidental to theory development at all, but an essential part of it." See H. Mintzberg, "Developing Theory About the Development of Theory," in "Great Minds in Management: The Process of Theory Development," eds. K.G. Smith and M.A. Hitt (New York: Oxford University Press, 2005): 355-372.

iii. See, for example, E. Wenger, R. McDermott and W.M. Snyder, "Cultivating Communities of Practice" (Boston, Massachusetts: Harvard Business School Press, 2002), 49-64; and J.S. Brown, "Narrative as a Knowledge Medium in Organizations," in J.S. Brown, S. Denning, K. Groh and L. Prusak, "Storytelling in Organizations: Why Storytelling Is Transforming 21st Century Organizations and Management" (Burlington, Massachusetts: Butterworth-Heinemann, 2005), 53-95.

iv. D. Lee, J. Simmons and J. Drueen, "Knowledge Sharing in Practice: Applied Storytelling and Knowledge Communities at NASA," International Journal of Knowledge and Learning 1, no. 1-2 (2005): 171-180.

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