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What Great Projects Have in Common

A brief discussion of research which identifies seven common characteristics of highly successful projects and also analyzes their implications for the future of project management, by Dov Dvir and Aaron J. Shenhar

[PROJECT MANAGEMENT]

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BY DOV DVIR AND AARON J. SHENHAR

From time to time we witness a project that stands out — surpassing expectations, creating exceptional value for the sponsoring company and for customers and eventually having an impact on its entire industry. We call such projects “great projects.” Consider the introduction of IBM’s AS/400 in the 1980s. In 1986, IBM’s market share in the growing, important mid-range computer business had shrunk to a single digit. However, 28 months later, a relatively small development lab in Rochester, Minnesota, was the talk of IBM. Engaging thousands of engineers around the world, the \$1 billion Silverlake project created the AS/400 computer, which was launched in 27 languages and soon became one of IBM’s most successful products ever.

In retrospect, the AS/400 development effort could be considered a great project. It was a game changer in the computer industry and gave IBM a competitive edge. Apple Inc.’s success in creating the iPod portable media player and iTunes online store is another more recent example of a great project — one that changed the way people listen to and buy music. Why are such projects so rare — and why can’t more projects be like them?

As part of a decade of research, we collected quantitative and qualitative data on more than 400 projects that were undertaken in various industries since the late 1950s. We looked at projects in their wider sense, that is, as *temporary organizational efforts to introduce change*. In addition to new product development, the projects we studied included product and process improvement, construction, IT and other organizational infrastructure, organizational change, reengineering efforts and marketing campaigns. Data sources included interviews with major players along with project document archives and reports and other published material when available.

From this collection, we searched for projects that stood out, resulting in unusual success and long-term impact. We designated a project as “great” only if:

1. It was a major undertaking of strategic importance to the initiating organization.
2. Its outcome contributed substantially and for an extended period of time to the performance



NASA’s Kepler project, which launched an extraterrestrial spacecraft in 2009 to search for Earth-like planets, had a team spirit that was energizing and exciting.

- of its organization and the well-being of customers and users.
3. It was highly innovative from a scientific, technological, design or operational perspective.
4. The project’s outcome had a major impact on its industry and stimulated others to follow in its footsteps.

We first identified 46 candidate projects that to some extent met all four selection criteria, according to our own judgment. We then turned to a group of five experienced executives, who had not participated in any previous phase of our studies. For each of the 46 projects, we asked them to assess to what extent they agreed that the project fit each criterion, on a seven-point scale. We then summarized the scores for each project and calculated averages across all respondents to develop a final list of 15 great projects.

Although the 15 projects in our study differed in goals, industries and technologies, we

found that seven managerial characteristics were common in our sample; each of the seven characteristics below were shared by at least 12 of the 15 great projects we identified.

1 A great project involves creating a unique competitive advantage and/or an exceptional value for its stakeholders.

For example, IBM AS/400’s advantage was creating a new modular standard in the minicomputer segment. The value of building the Sydney Opera House in Sydney, Australia, was constructing a unique architectural wonder that draws millions of visitors every year. And the value of the Mall of America, an indoor mall/entertainment complex in Bloomington, Minnesota, that attracted more than 40 million visitors in its first year of operation, was its unprecedented size combined with an exciting theme park in a cold Midwestern state. (Continued on page 20)

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2 These projects began with a long period of project definition that was dedicated to defining a powerful vision and clear need and selecting the best execution approach. The extended time was also needed to obtain buy-in from all stakeholders. For example, the Atlantic Crossing project, a transatlantic optical cable laid by Tyco Submarine Systems Ltd. between the U.S., Germany and the U.K, had to fill in an immediate gap in circuit demand to Europe; nonetheless, its definition and planning phase consisted of 17 distinct steps, some performed long before the contract was awarded. Another example was the strategic alliance that the Boeing Co. created with eight leading customer airlines for shaping the configuration of and defining the requirements for the Boeing 777, a twin-engine wide-body aircraft that was developed in the 1990s and became one of the best-selling planes in Boeing's history. And NASA's Kepler project, which launched an extra-terrestrial spacecraft in 2009 into the Milky Way to search for Earth-like planets, was conceived during a decade-long period that involved defining its vision and mission and selecting the best way to carry out the project.

3 Great projects create a revolutionary project culture. The execution of great projects often requires a different project culture, which can later spread to an entire organization. Working with its partner carriers and a network of suppliers for the 777, Boeing created the most user-friendly development environment the company had ever used. That, along with a new CAD/CAM system, changed the way Boeing designed and manufactured commercial aircraft. Similarly, the Z3, a stylish roadster developed by the BMW Group in the early 1990s, changed the way BMW builds cars. The Z3 project's culture was focused on design simplicity and extensive prototype testing, which enabled the company to start manufacturing outside of Germany. Z3 was the first BMW produced in the U.S., and when launched, it surpassed the company's sales expectation by more than 50%.

4 A great project needs a highly qualified project leader who is unconditionally supported by top management. Not surprising, highly qualified leaders make a difference. More specifically, a successful project leader should have high personal skills, excellent communication qualifications and connections to upper management. In some of our cases, the project manager was even a member of the top management team. For example,

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- ▶ A.J. Shenhar, "One Size Does Not Fit All Projects: Exploring Classical Contingency Domains," *Management Science* 47, no. 3 (March 2001): 394-414.
- ▶ A.J. Shenhar, "Strategic Project Leadership®: Toward a Strategic Approach to R&D Management," *R&D Management* 34, no. 5 (November 2004): 569-578.
- ▶ A.J. Shenhar and D. Dvir, "Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation" (Boston, Massachusetts: Harvard Business School Press, 2007).

Tom Furey, the director of IBM's Rochester Development Laboratory, served also as the Silverlake project manager.

However, having a great leader is not enough. Almost all projects are often plagued by problems, conflicts and crises. Yet in the great projects we studied, top management's support reflected a strategic decision to continue with the project until its successful end. A typical example was the U.S. Army's Mobile Subscriber Equipment project (MSE), which in the 1980s built an area-switched integrated communication system designed to replace legacy systems in the U.S. Army division and corps levels. The then Secretary of Defense made MSE part of his high-priority Defense Enterprise Program. This imbued the project team with a sense of importance and allowed the Army to implement new streamlined acquisition processes. The resulting MSE system built by GTE proved far superior to previous generations and provided the base for modernizing army communications at the time.

Similarly, Microsoft's Bill Gates strongly supported the Word for Windows project until its successful end in spite of significant problems, frequent redesigns and painful delays. After its launch in 1989, Word for Windows soon become the new market standard for word processing.

5 Great projects maximize use of existing knowledge, often in cooperation with outside organizations. All successful projects in our sample adopted everything they could, rather than trying to reinvent what was already known. Existing technology components were either adopted from previous projects or brought in from the outside. For example, Word for Windows used the existing Word for Macintosh design; Boeing 777 used CAD/CAM software purchased from Dassault Systems. And when the World Trade Center project was built in New York City in the 1960s, it adopted an Italian technology to cope with reaching bedrock water levels in the Hudson River. Finally, for its iPod and iTunes design, Apple adopted existing technol-

ogies that had been developed by Fuse and PortalPlayer Inc.

6 These projects have integrated development teams with fast problem-solving capability and the ability to adapt to business, market and technology changes. Although previous research has identified the importance of open communication within a project team, we found that what really made the difference was the multidisciplinary structure of the teams and their ability to solve problems as they developed. The teams were also able to quickly adapt to changes in the business and technological environments, often refocusing the project in a different direction. Almost all the great projects in our study had truly diverse teams with representatives from around the company and beyond. Apple, for example, is well known for engaging people from design, manufacturing, software and packaging in an ongoing process of product and technology development that facilitates quick adaptation and changes.

7 Great project teams have a strong sense of partnership and pride. A dedicated team working long hours to overcome obstacles often distinguishes a great project from a more ordinary one. Today, more than 25 years later, the story of the spirited Apple team that in the 1980s developed the first Macintosh, a new category of easy-to-use computers, still generates interest. More recently, NASA's Kepler project team spirit was informal, energizing and exciting. Team members were inspired, proud and committed to the project's vision. They took ownership of the project, without too much direction from higher-level management.

What is new here? Some of these factors appeared in previous studies, so what can we learn from this research? What makes the findings of in this study useful is the specific *focus and combination* of factors. For example, managers of great projects understand that their project's mission is *not* just to deliver a product; rather, it is to make a difference and create a unique com-

petitive advantage and exceptional value for customers. Similarly, having a good project leader is not enough; he or she must have unconditional top management support. And just building a cross-functional team is not sufficient; such teams must learn to work together, communicate well, have a sense of pride and above all develop the ability to quickly solve problems and adapt to changes in a fast-moving business environment.

One of the benefits of this study may be its contribution to the ongoing debate about the right approach to project management. Traditionally, project management was perceived as an operational undertaking, where most projects could be managed in a similar way — with project activity focused on creating a good plan and then making every effort to stick to the plan throughout the project. A project's goal was to meet time, budget and requirement goals, and success was measured by how well the team could achieve that goal.

The classical approach to project management has been challenged in recent years by suggestions to adopt a more adaptive and strategic approach. According to this view, projects are major drivers of change and vehicles for creating future businesses. A project's goal (and its team's responsibility) is to achieve business results by exploiting new market and technological opportunities and by creating competitive advantage and added value. In addition, this strategic approach suggests that "one size does not fit all," and planning and execution must adapt to the specific project context and the dynamic changes in the environment during the project's execution. The great projects in this study clearly used an adaptive and strategic approach. If top executives will realize the importance of projects for their organizations, while learning the ingredients of outstanding projects, perhaps there will be more great projects.

Dov Dvir is a professor of management at Guilford Glazer Faculty of Business and Management at Ben Gurion University of the Negev in Beer-Sheva, Israel. **Aaron J. Shenhar** is a professor of supply chain and project management at Rutgers Business School, Rutgers University in Newark, New Jersey. Comment on this article at <http://sloanreview.mit.edu/x/52316>, or contact the authors at smrfeedback@mit.edu.

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