The Benefits of Applying Project Management in the Manufacturing Industry

MASTER OF SCIENCE IN MANAGEMENT
OF PROJECTS AND PROGRAMS

Rabb School of Continuing Studies
Division of Graduate Professional Studies
Brandeis University

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Abstract

Project management is a discipline that can be applied to all industries, and can be particularly effective in the manufacturing industry. Manufacturing relies heavily on quality and time to market to build and retain its customer base, so these two factors—quality in particular—need to be the focus during the manufacturing process. When a project management methodology is applied to the manufacturing process, its tools and techniques can ensure that quality standards are met and the time to market is efficient. This will be achieved primarily through the techniques of planning, scheduling, risk management, quality management, quality assurance and quality control, and lessons learned.

ABOUT THE AUTHOR

Leanne Bateman, MA, PMP, CSM, is the Academic Program Chair of Management of Projects and Programs at Brandeis University, Division of Graduate Professional Studies (GPS). She also is a faculty member, and the Principal Consultant with Beacon Strategy Group, a Boston-based management firm specializing in project management services. Leanne has 18+ years of experience across the areas of health care, biotech, information technology, high-tech manufacturing, human resources, construction, senior housing, government, and higher education. She is a member of the Project Management Institute, a certified Project Management Professional (PMP), and a certified Scrum Master (CSM).
Project management is a discipline that can be applied to all industries, regardless of the product or service they are designed to deliver. Beyond its basic application across various industries, project management has tremendous value when effectively implemented to significantly increase the success of the product or service being delivered.

The manufacturing industry utilizes machines, tools and labor to mass produce goods for use or sale. Raw materials are processed into finished goods on a large scale, to be sold to wholesalers. Wholesalers sell the finished product to retailers, who in turn sell them to a consumer base for a profit. Manufacturing is closely related to industrial design and engineering.

Manufacturing by nature is heavily embedded in process. Each process builds upon the next, so the product is built cumulatively as each layer of the manufacturing process is applied in a sequential order and in a quality-controlled environment.

Project management can be highly effective in manufacturing because it is also, by nature, process based. The sequential phases of the project management lifecycle directly support the product lifecycle in manufacturing, making it an invaluable tool in facilitating the delivery a product that directly corresponds to its original requirements.
Every industry has different “stress points”—those points that are most critical to the specific product or service being delivered. The most typical stress points are schedule, cost, and quality. Depending on the industry, one (sometimes more) of these stress points directly affects that industry’s profit, thereby making that point absolutely critical to the success of the product, and the company delivering it. It becomes, therefore, a priority in the set of processes involved in producing the product.

Because manufacturing involves a set of processes where each process builds upon the next, quality is of the utmost concern at every stage of each process and every phase of the product being manufactured. Therefore, quality is often the primary stress point in the manufacturing industry.

Quality is directly related to customer satisfaction, and ensures a product will be tried, adopted and regularly purchased by the consumer, thereby directly affecting the company’s profit. If there is an issue around the quality of a product, it will be rejected by its customer base and the issue of damage control becomes priority as the company’s reputation and profit begin to suffer. It is far more difficult to recover from poor quality than it is to ensure it in the first place.

Depending on the product being manufactured, schedule can also be a critical stress point and can sometimes overtake quality for the number one spot. Time to market (TTM) is crucial in highly competitive areas where market share is based on who offers the product first. It could be a new product or an upgraded product.

Apple is a great example of an industry leader who follows an aggressive TTM schedule to consistently deliver products that have the public preordering and lining up outside the store before they even know how the new or upgraded product will work. Apple also has a reputation for quality, so consumer trust is high enough that customers typically do not feel they need to understand how the product will work because they have confidence in Apple products based on their past experience.

This type of customer loyalty is critical to companies in the manufacturing industry. This loyalty measures the degree to which consumers prefer and continue to purchase the same brand, which in turn increases customer retention for that brand. This retention directly and significantly impacts the company’s profit. In fact, one study showed that “a 5% improvement in customer retention will yield a 25-30% increase in profitability across a variety of industries.”¹ Given this impact, it makes complete sense that quality should be the primary focus in the manufacturing process.

Since the two key challenges in the manufacturing industry are quality and schedule, both of which are directly addressed by the tools and techniques used in project management, it follows that applying a project management methodology in the manufacturing industry is a wise business strategy.

The Benefits of Applying Project Management in the Manufacturing Industry

A report from the Economist Intelligence Unit was conducted in March 2010, and outlined the benefits of applying project management to the manufacturing industry. The report included feedback received from 251 senior executives in the manufacturing industry from around the world.

The result of this survey found that:

• Industrial manufacturing projects are more likely to come in on time and on budget when project managers report directly to senior executives.

• Strong project management methodologies give teams more flexibility, increasing the likelihood of success.

• Organizations with a mature approach to project management (established project management methodologies and trained professionals) recognize the importance of risk management.

• The right tools enable project teams to manage risks and reduce errors but do not take the place of good oversight.

The findings of the Economist Intelligence Unit report reflect the industry-specific challenges of manufacturing.

Top project management challenges vary by project phase (% respondents)

<table>
<thead>
<tr>
<th>Design phase</th>
<th>Manufacturing phase</th>
<th>Installation phase</th>
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<tbody>
<tr>
<td>Clearly defining scope based on client specifications</td>
<td>Meeting quality, cost and on-time delivery goals</td>
<td>Meeting quality, cost and on-time delivery goals</td>
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<tr>
<td>Accurately forecasting timelines</td>
<td>Controlling scope creep and change orders</td>
<td>Controlling scope creep and change orders</td>
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<tr>
<td>Accurately forecasting budgets</td>
<td>Controlling project progress while overseeing multiple contractors over long periods of time</td>
<td>Controlling project progress while overseeing multiple contractors over long periods of time</td>
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<tr>
<td>Changing customer demands</td>
<td>Securing cost-effective materials and resources</td>
<td>Managing changing client expectations</td>
</tr>
<tr>
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<td>66</td>
<td>49</td>
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<td>53</td>
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<td>36</td>
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They also highlight some key points in the application of project management:

**Management Support**

It is critical that the Project Manager have a direct line of contact, communication and support with the Project Sponsor.

**Senior-level oversight improves chance of success**

Percentage of projects delivered on schedule and at or below budget in the last three years, based on seniority of person with overall responsibility for project management across the business.

(% respondents)

<table>
<thead>
<tr>
<th>Role</th>
<th>On schedule</th>
<th>At or below budget</th>
</tr>
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<tbody>
<tr>
<td>Project management office</td>
<td>41</td>
<td>30</td>
</tr>
<tr>
<td>Senior-level executive</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>Project sponsor</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Varies from project to project</td>
<td>27</td>
<td>20</td>
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Project Management Methodology: Tools and Techniques

There should be an established project management methodology in place, within which the Project Manager can effectively manage the tasks, milestones, deliverables, and stakeholders during the lifecycle of the project.

Robust methodology underpins proficiency

Assessment of organization’s proficiency at managing each project stage, based on approach to project management. (% respondents)

Organization-wide approach applied uniformly to all projects

- Good or excellent: 62%
- Not very good or bad: 14%

General approach, customized by project

- Good or excellent: 39%
- Not very good or bad: 11%

Informal approach determined by project managers

- Good or excellent: 32%
- Not very good or bad: 20%

Do not use project management methods

- Good or excellent: 30%
- Not very good or bad: 20%


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The Importance of Risk Management

This established project management methodology would support a strong and consistent focus on risk management, which is a key concern in the manufacturing industry, primarily in terms of quality.

Foresight and action critical for success

Respondents who consider this skill critical, based on approach to project management. (% respondents)


Identify risks and avoid or mitigate their impact

- Organization-wide approach applied uniformly to all projects: 52
- General approach, customized by project: 40
- Informal approach determined by project managers: 32
- Do not use project management methods: 10

Identify problems and solve them quickly

- Organization-wide approach applied uniformly to all projects: 58
- General approach, customized by project: 44
- Informal approach determined by project managers: 56
- Do not use project management methods: 20
Project Manager Leadership

Even more important to the success of the project, beyond the various tools and techniques of a project management methodology, is the critical skill of leadership on the part of the Project Manager. Effective leadership requires solid and effective skills in the areas of communication, decision making, negotiation, relationship building, conflict resolution, and diplomacy.

The advice from the senior managers polled in the survey is derived from their own lessons learned in the manufacturing industry:

Lessons learned: advice from industrial manufacturing experts
Project managers in every industry can benefit from lessons learned by industrial manufacturing experts. These include:

- **Create a sense of urgency from day one.** Setting early goals and demanding accountability upfront create a culture that is focused on getting the job done.

- **Conduct milestone reviews that go beyond contractual obligations.** The more often progress is tracked and compared with forecasts, the easier it is to identify problems and pull the project back on track.

- **Track progress, without getting trapped in the minutiae.** Project managers have to find the balance between tracking tasks and the cost, in time and money, of doing so.

- **Focus on more than one problem.** Keeping the big picture in view when making decisions enables project managers to choose solutions that lead to overall project and business success.

- **Remember that the project manager’s reputation is on the line.** It is not enough to come in on time and on budget. If the customer is not happy with the way the project was managed or with the outcomes, it will be considered a failure.

- **Balance the information overload.** A good project manager gives clients enough information about the project to be informed, but not so much that they are overwhelmed.

- **Prove the project manager’s worth in bottom-line results.** “If a project manager shows that a project’s return on investment is at least 1–15%, ” says Mr. Gil of Enercon Engineering, “the project manager is paying for himself and the company is making a profit.”

Lessons learned is an important project management tool that helps an organization learn from their past to prevent making the same mistakes in the future. This is critical in manufacturing, where consumer trust is the lifeline of the manufacturer’s profit.
The MSMPP Curriculum and its Relevance to Project Management in the Manufacturing Industry

There are seven core courses and three electives required to complete the Master of Science in Management of Projects and Programs (MSMPP) at Brandeis University. The core courses are:

- Foundations of Project Management
- Professional Communications
- Advanced Scheduling and Control
- Organizational Leadership and Decision Making
- Risk Management in Projects and Programs
- Negotiating and Conflict Resolution
- Program Management: Theory and Practice

These courses, particularly the first six, are directly applicable to managing projects in the manufacturing industry. Consider the important points specific to the manufacturing industry that were highlighted previously and part of the findings of the Economist Intelligence Unit report: each one of those points directly corresponds to one or more of these core courses:

**Management Support:**
- Professional Communications
- Organizational Leadership and Decision Making
- Negotiating and Conflict Resolution

**Project Management Methodology:**

**Tools and Techniques**
- Foundations of Project Management
- Advanced Scheduling and Control
- Risk Management in Projects and Programs

**Risk Management**
- Advanced Scheduling and Control
- Risk Management in Projects and Programs
- Negotiating and Conflict Resolution

**Project Manager Leadership**
- Professional Communications
- Organizational Leadership and Decision Making
- Negotiating and Conflict Resolution
- Program Management: Theory and Practice

The Management of Projects and Programs curriculum at Brandeis University, therefore, is highly relevant to anyone interested in a project management career within the manufacturing industry.

For information about the program, please visit the program website.
Master of Science in Management of Projects and Programs

In summary, the MSMPP seeks to advance project and program management professionals in the field by providing a robust curriculum that balances the hard and soft skills essential of project and program managers. The curriculum is aligned but not tied to PMI Standards, allowing the master’s program to retain its applied focus and while recognizing the relevance of the professional standards.

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