

Project Management and the Company

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Abstract

With the evolution of projects in industry and the complexity of today's projects, a strong need for project management has arisen. A project manager has to successfully deal with vendors, production, upper management, and design to meet the needs of the demanding customer. The time-to-market interval for new products and projects is continuously decreasing to meet the needs of the market and the customer. This increased urgency has created the need for close management of projects to ensure that the customer's needs are met. A project manager has certain guidelines that must be considered in order to successfully and consistently complete projects in a timely manner. Many educational institutes as well as an agency called the Project Management Institute are now offering formal training for project managers. This report defines what a project and its related tasks are, what a project manager is, and the different types of project management.

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1. Introduction

With the complex, high paced technological industry that exists today, the need for efficient organization is evident. This need for organization stems from the three basic trends that have evolved during this century. The tremendous growth of the human knowledge base, the increase in the need for complex and customized goods and services, and the creation of a global production-consumption environment have cultivated a working environment where the use of teams for problem solving is essential. From the environment created by these three basic trends, the project manager was born. Activities that were once handled by individuals have exploded into large projects due to the complexity and demand of today's needs (Meredith, 1995: 1).

2. The Project

What exactly is a project and where did it come from? Some would consider the start projects to stem as far back as the marvels of the ancient world, others argue that "real" projects did not truly come into existence until this century, beginning with the Manhattan project which developed the atomic bomb (Meredith, 1995: 7). While the origin of the "project" will always be under debate, present day projects consist of anything from advertising campaigns and global mergers to computer software development and technical research and development (R & D). In the most general terms, *a project can be defined as a temporary endeavor undertaken to create a unique product or service*. For a project to be temporary and unique, the product of that particular project must differ in some way from other similar products and must have a definite beginning and end. (PMI Standards Committee, 1996: 4).

A typical hierarchical nomenclature exists in industry today. *Programs* exist on a high level and consist of interdependent, self-contained *projects*. These projects consist of *tasks* or ideas that must be accomplished for the project to succeed. The day-to-day *activities* that are required to complete the tasks are the backbone to every project (Meredith, 1995: 7). Projects receive the most visibility through the programs that exist within the organization. Large programs are especially evident and necessary in large companies and corporations such as Nortel. In these large businesses, each different general technology or product line (CDMA, TDMA, and Amps exist at Nortel Wireless) becomes a program out of the necessity. In each program, every different product is generally a project. However, in some cases, products require division into a multitude of projects because of their inherent complexity. Under each product, the tasks necessary to accomplish the project are discussed by core project teams and divided or assigned to each of the functional group involved. A project is a self-contained unit that is measured against a set of success metrics to determine if the desired result has been obtained. While a project is its own unit, strong dependencies exist between projects to facilitate the needs of the program in which the project exists. Interdependencies within a company not only exist between projects but also between functional support groups and external customers. Coordination of these groups is the essential responsibility of a project manager.

3. The Project Manager

The project manager essentially orchestrates all related groups, management, the customer, and other external groups in a cohesive manner. The purpose of a project manager is to coordinate and facilitate, by all means available, a smooth, well-planned, and easily executable project. “Organization allows the project manager to be responsive to the client and the environment, to identify and correct problems at an early date, to make timely decisions about trade-offs between conflicting project goals, and to ensure that managers of the separate tasks within the project do not optimize the performance of their individual tasks at the expense of the total project – that is, that they do not suboptimize”. (Meredith, 1995: 112)

The project manager must consider many things. When considering the “life cycle” of a project, a project manager must examine time and effort constraints, contributing functional groups, and core team members. The pattern or cycle of a project is similar to driving over a hill. The effort is steady as the car goes up the hill, building energy as it goes, its energy peaks at the crest of the hill, and then the energy is lost very quickly as it progresses down the hill until it levels off again. This is similar to the slow-rapid-slow effort cycle of a project. One would expect that there would be no slow stage of effort at the end of a project, and in fact, some projects never do realize this slow phase. There is no reason that the effort put forth in the beginning of a project should match that of the end. Other projects die like the dying embers of campfire, glowing faintly enough to remind you that it is still there but not doing anything useful. The amount of effort put forth is always most intensive during the bulk of the project as deadlines and roadblocks interfere with each other. A typical life cycle is illustrated in **Figure 1** (Meredith, 1995: 14).

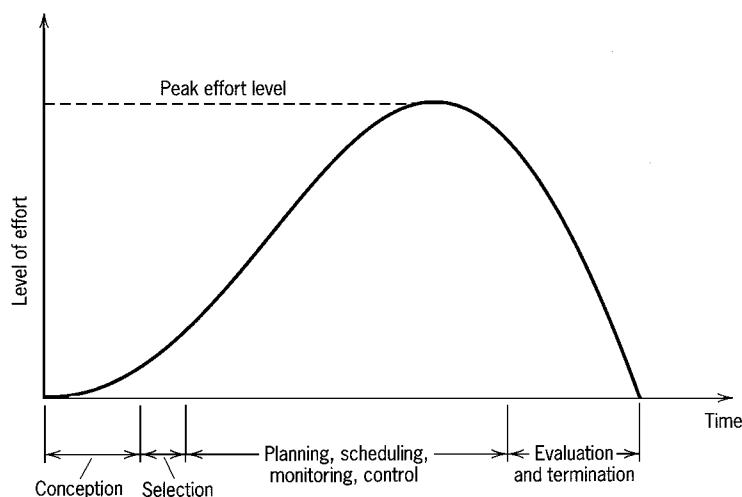


Figure 1: Time distribution of project effort.

Conflicts are another hurdle for project manager’s to face on a day to day basis. The project manager acts like a catalyst that controls the potentially volatile reaction of people, material, time and effort. A mixture that, while unprovoked, remains quite content (Interview, Robert Mair).

4. Methods of project management

4.1. Project Selection

The proper selection of a project essentially sets the precedent for the entire project. Models exist to assist decision-making and to express the facts of the project in a clear and concise manner to facilitate the person(s) responsible for decisions in any particular company. One downfall to project selection is that often, in large companies, the project manager does not have any input into the project selection. A project is often assigned to a project manager without him/her having any previous knowledge of the product. Choosing a bad model to represent the project could condemn a project in its infancy, never getting the chance to offer success to the company. This lack of input places limitations on the flexibility that the project manager has to ensure the project's chance of success. Regardless of who is in charge of choosing the project, certain ideas must be considered: realism, capability, flexibility, ease of use, computerization, and cost. (Meredith, 1995: 113)

4.1.1. Realism

Realism is necessary to make an effective decision as to where the future of a project lies. A realistic view of what the project is or will be contributing must also be considered so that non-value added projects are not kept around just because of personal attachment. Be it the project manager or senior management, whoever is responsible for making such decisions in a company must keep a realistic view of feasibility, current markets, resources, time constraints, and the company's own limitations.

4.1.2. Capacity and Flexibility

The actual capacity of a project should be considered in relation to the company itself when evaluating a project model. A model must be complex enough to handle multiple time periods and unforeseen internal and external situations that may be encountered. The flexibility must be available to handle this range of conditions, be easily modified for effective use, and must optimize information so that the project model becomes a highly effective tool in the decision making process.

4.1.3. Ease of Use, Computerization, and Cost

The project model itself must be easily understood, straightforward, efficient, and convenient to use. Computerization is an effective tool in making project models accessible and useful. They have decreased the data acquisition, time of use, and cost and increased productivity. The cost of any modeling and associated activities must be low relative to the actual project cost and significantly less than the potential benefits of the project.

4.2. Types of management

A project manager has a diverse role, being a single source from which all groups feed (Interview, Robert Mair). Each functional group in the company with applicable input will feed into the project manager thereby allowing the project manager to facilitate the entire project. Where conventional or functional management oversees a related group of people that work with a special and related set of skills (for example, see **Figure 2**), a project manager organizes and controls a project through a cross functional team as illustrated in **Figure 3**. (Meredith, 1995: 110-111)

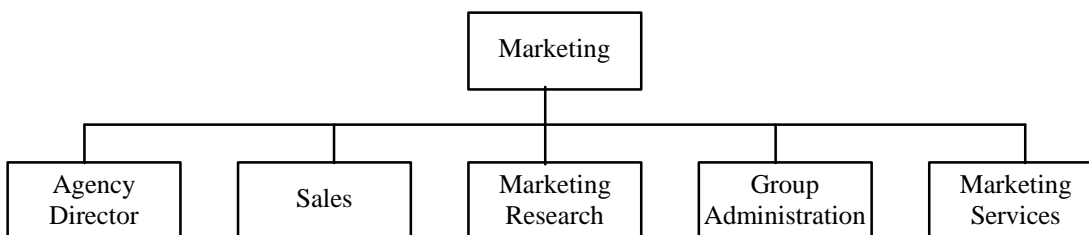


Figure 2: Illustrative example of Functional Management organization.

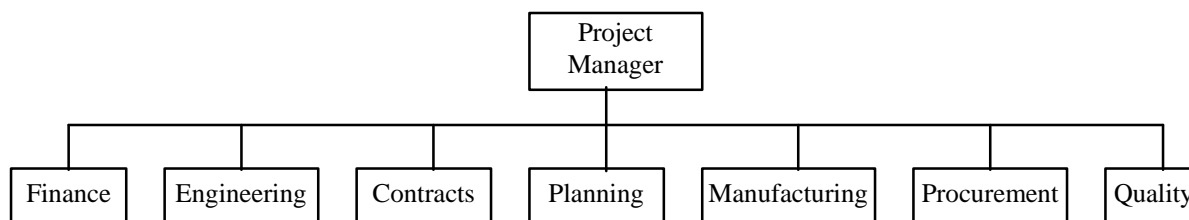


Figure 3: Illustrative example of the responsibilities of a project manager in the project management organization.

The project manager is responsible for keeping senior management completely informed of project status. Senior management must never be surprised by the outcome of any tasks or activities. When possible, all communications should arrive in a timely and accurate manner. The project manager has a responsibility to the project to ensure that the project is not in jeopardy or going off course due to the demands of the different parties involved. Another basic responsibility of the project manager is to the project team. Just as the project team has a responsibility to the project manager and the project to ensure that each individual component is completed, the project manager also has an equal responsibility to assist and guide the project team through the project (Meredith, 1995: 112). This aspect becomes increasingly important as a project ends.

A project manager must excel in several areas in order to complete the job successfully. The “Project Management Knowledge Areas” make up a large portion of the Project Management Body of Knowledge (PMBOK) for project manager’s. Nine areas of management exist to

construct the framework for the processes and responsibilities that a project manager must perform. These nine areas are integration management, scope management, time management, cost management, quality management, human resources management, communications management, risk management, and procurement management and are illustrated in **Figure 4** (PMI Standards Committee, 1996: 7). Processes are essential to every component of a projects success. From my experience at Nortel, I have come to define process as something that is able to be defined and is repeatable. The most effective way to instill process into any project is through written documentation such as a project plan.

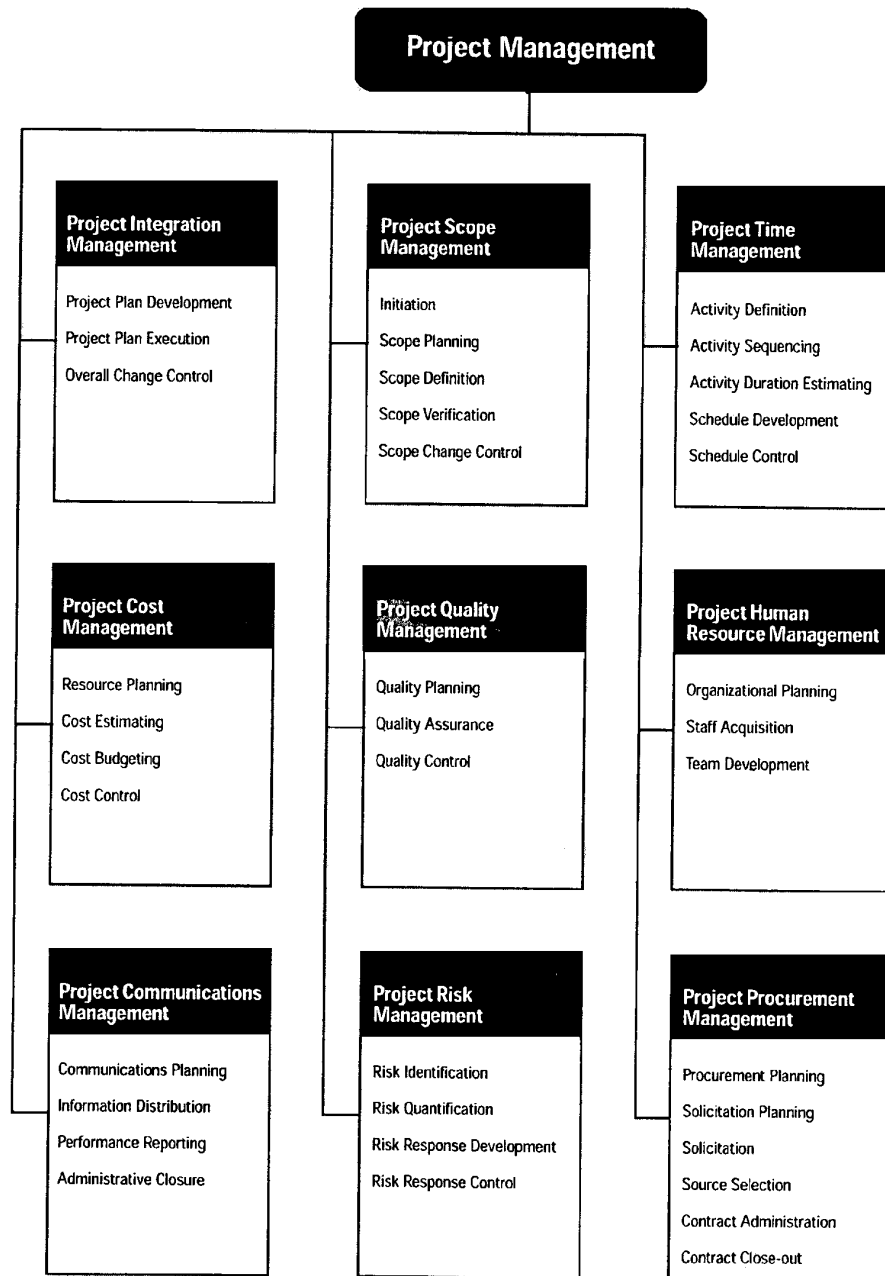


Figure 4: Overview of Project Management Knowledge Areas of Project Management Processes.

4.2.1. Integration Management

For integration management, the most effective way to ensure that processes are in place and that the people involved with the project have guidelines to follow is to create a project plan. This helps maintain the project on its time line and it creates an incredibly powerful tool to execute the project. In the development of a project plan, many factors are used as inputs into its creation. Background information positions the project's existence within the company and in the current market. Both external and internal organizational policies must be adhered to. Constraints are placed on the project itself that limit the projects existence. In addition, assumptions are made in order to help the project progress forward but are not necessarily verified factors and/or influences. From these inputs, a project plan is created. With the project plan complete, a project manager is able to (a) monitor and measure the progress of the project against a pre-determined standards or success metrics and (b) determine the need for change and monitor changes that have already occurred in the project. With a project plan, an important point to remember is that flexibility is absolutely necessary. Preliminary planning is not going to carry a project to completion no matter how well the preliminary plans are done and no matter how good a person may think they are at project management.

4.2.2. Scope Management

An accurate scope of a project is very important to its survival. There are many steps to having the scope defined accurately, and as such, Scope Management becomes a core element to project management. Scope management includes the processes required to ensure that the project includes all work required, and only work required, for completing the project successfully (PMI Standards Committee, 1996: 7). The first step is to gain commitment from management to initiate the project. Scope planning begins with the creation of a written scope statement and becomes the basis for future project decisions. This leads to the scope definition where the subdivision of the major project deliverables into more focused and more manageable components takes place. All groups within the organization must then formally accept this scope definition. As change is a continuous evolution, the scope of a project at any point in time is under development and must be open to necessary change. This requires that the project manager must control and evaluate the changes that occur throughout the project.

4.2.3. Time Management

In today's fast paced market, time is of the essence and must be capitalized. Two parts of a project are integrated into Time Management. The first being the tasks and activities of the project and the second being the scheduling of the project itself. The tasks of a project must first be defined and then categorized into the specific tasks required for the various project deliverables. These tasks must then be sequenced so that all interdependencies are documented. An estimate of the duration of the tasks is completed and is used as input into the project schedule. This results in effective, organized, and timely execution of tasks and, ultimately, of the project deliverables. Scheduling is also an essential factor to a timely delivery of a project. The smaller the project, the more closely sequencing, duration, and scheduling are viewed as a

single process. Scheduling is the culmination of task sequencing, task duration estimation, and resource requirements to produce a project schedule, usually with the aid of computer software such as Microsoft Project®. Starting with a well-laid out project schedule will allow for flexibility and control over and change throughout the project.

4.2.4. Cost Management

Money is always the object of management and customer concerns in any organization. Is this product or project going to be worth the money that we are going to invest into it? The answer is that there are steps that can be taken to give management, customers, and other important stakeholders a realistic and somewhat accurate estimate or budget of the project, even in the preliminary stages. Working from the project schedule, including the sequencing, duration, and resource allocation of the tasks that make up the project deliverables, an analysis of people, equipment, materials, and various other resources can be accomplished. Developing estimates of the cost of the resources for each of the tasks involved produces input for the budget. Cost budgeting allocates cost to each of the resources and produces an overall cost analysis from which to work. Controlling changes that occur in the project due to hold-ups and unforeseen mishaps can be expressed in the budget for easier communication to interested parties. Thus, budgets and scheduling prove to be an effective tool in communication and, quite possibly, could mean the difference between failure and success.

4.2.5. Quality Management

In the technology industry, quality standards are a very important part of everyday life. Many organizations have set quality standards, including Nortel's Corporate Standards, set out for all projects to follow. There are also ISO (International Standards Organization) quality standards to contend with. In considering how to deal with quality issues, planning begins by examining the project and identifying what quality standards come into question. How to go about satisfying the issues or non-conformances that arise are determined and a plan is implemented. Evaluation of these solutions during the project is an on-going process to ensure that the quality standards, both internal and external, are satisfied continuously. Strict control of the project is imperative to ensure that non-conformances do not repeatedly occur. As new issues arise, identifying solutions to the non-conformances is an absolute necessity.

4.2.6. Human Resources Management

Working and interacting with a large number of different people is one of the toughest aspects of project management. The project manager designates roles and responsibilities within the project and within the core project team according to the cross-functional relationships that exist. Information must be documented and easily accessible to reduce the conflict that can occur within the different functional groups of the project team. Staffing and space are also very important issues that require the attention of the project manager. Simply stated, if the space is unavailable to build the product or if there is a shortage of people to build the product then the

product will, most certainly, not be built. Alternately, if there is too much space or too many people assigned to the build then the company is supplying non-value-added support to the project. Another concern when dealing with staffing issues is that of the team spirit. Development of the individual and of the team as a whole plays an important role in teamwork, group dynamics, and increased project performance. I have discovered in my time with Nortel that a team is more effective if a cohesive bond and open lines of communication exist in the work environment.

4.2.7. Communications Management

Good communication is an important component to the success of a project. When organizing the communication links that must be in place in order to establish strong group dynamics, three basic questions must be asked; who, when, and how. Who needs to know what information that the project manager holds? When does that person need it by? How is the project manager going to deliver this information? If answered properly, these three issues will create open and effective communication between all of the stakeholders and the project manager. However, if not dealt with completely, the life of the project is jeopardized due to the fact that the essential links to the life line of the project are not receiving the right information in a timely manor. It is the responsibility of the project manager to collect and propagate information such as project status reviews, progress measurements, and forecasts through its essential and designated lines of communication. As the project manager is the driving force of the project, they must gather, generate and circulate administrative process documentation meant to recognize and formalize a projects' progress through such milestones as phase achievement and, ultimately, project completion itself.

4.2.8. Risk Management

Risk analysis is a major influence to senior management when reviewing initial project plans and it continues to be a strong driving force as the project cycle churns. Risk analysis involves the identification, qualification and response development of a product or project. Identification of risks incorporates determining which risks are hindering to the project and documenting the attributes of each of these risks. The next step in risk analysis is the qualification of the risks. This is accomplished by evaluating each of the risks involved with the project and their interdependencies. Assessing these risks leads to a multitude of possible project outcomes or scenarios. Using the scenarios found in the assessment, a definition can then be created for both the areas for enhancement and threats to the project. Risk assessment must continue to evolve as the project continues, reaffirming the need for flexibility from the project manager.

4.2.9. Procurement Management

In larger organizations, procurement is generally performed by a separate department while in smaller companies procurement is performed by the project manager of each individual project. The procurement process consists of identification, planning, solicitation, source selection,

contract administration, and contract closure. Identification and planning consist of determining what to procure and when it is needed by. Documentation of the requirements of the product and identification of potential sources is then required. As solicitation begins, the quotations, bids and proposals are negotiated which leads to the source selection where decisions are made as to which of the suppliers to conduct business with. The relationship with the supplier is managed while negotiations and the writing of contracts takes place. The contracts are then agreed upon and any unresolved issues are attended to before this point. This is the essential procurement process and it helps to ensure that all products and services needed to complete a project are correct, in place, and on time.

5. Conclusion

In today's technological markets, project management is a necessity to keep a company organized, efficient, and competitive. Programs and projects have become commonplace in industry today. Project managers must have excellent organization, time management, conflict resolution, people skills, and above all, flexibility. In the realm of R&D, nothing is ever stable or predictable. A project manager must be able to accept and adapt to constant change. Effective project management takes many years of practice and experience. The project manager has a responsibility to management, the project team, and the project itself. Following the process designed by the project manager and his team and using such criteria as integration or planning, scope, time, cost quality human resources, communications, risk, and procurement, a project has a much higher chance of success. If poor communication or planning happen repeatedly then conflicts result.

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