Project Management

Project management is formal management decipline in which projects are planned and executed using a systematic, repeatable, and scalable process. A project is defined as:

A unique set of activities that are meant to produce a defined outcome,

With a specific start and finish date, and a specific allocation of

resources.

Because a project is bounded by its results, time, and resources, we often need to make trade-offs among these three elements, or project “parameters.” Thus project management is the process of developing substantive, systematic data about each parameter so that the trade-off decision making between parameters is more effective. The project management process, in turn, is a series of steps given below.

Steps involved in project management are:

1. Define and Organize the project
   1. Establish the project organization
   2. Define the project parameters
   3. Plan the project framework
   4. Assemble the project definition document
2. Plan the project

2.1) Develop the work breakdown structure

2.2) Develop schedule

2.3) Analyse resources

2.4) Optimize trade-offs

2.5) Develop risk management

1. Track and manage the project

3.1) Collect status

3.2) Plan and take adaptive action

3.3) Close out the project

Benefits.

1. Develop a full understanding of the project goals, objectives and benefits before committing significant resources. This ensures that only the projects which are expected to provide benefits exceeding the investment of time and money are initiated.
2. Ensure that the project proceeds effectively through all the essential phases, from concept through to completion. This makes sure the project is properly reviewed by the stakeholders at key stages including initiation and final acceptance.
3. Provide a rigorous approach to defining a realistic, but still challenging, timescale and budget for completion of the project.  
   Establish a structured approach for clearly defining roles and responsibilities for the delivery of the project and its work packages. This is critical to building commitment to the project objectives.
4. Implement a systematic process to manage changes to the project scope or objectives. This minimises the risks associated with change to the end-product or to the benefits for the sponsors.
5. It is important since it ensures that what is being delivered is right and will deliver real value against opportunity.
6. It is important since it brings leadership quality and risk taking ability to the person who is representing project.
7. It also ensure the quality of whatever is being delivered, consistently hit mark.
8. The biggest benefit of efficient management is ultimate flexibility. It allows you to firmly map out your strategies on how you want your project to get completed. But, the biggest benefit of this organisation is that when you discover any smarter direction, you can immediately take it. For all types of companies, this alone is worth the cost of admission.
9. Whenever you complete any project on time and within budget, the customer will walk away satisfied and happy. So happy customer is one that you’ll see again and again, and he will also recommend your business to hundreds of other people. Greater awareness about your business means greater sales and profits. Smart management of project is done using tools that enable client/manager relationship to flourish.
10. Efficient management can provide a roadmap that can be easily followed and may lead to project completion. Once you know where to avoid pot holes and bumps, it’s certain that you’ll work smarter and not harder resulting in greater productivity that will last for a very long time.

Agile Development

In software application development, Agile is a methodology that anticipates the need for flexibility and applies a level of pragmatism into the delivery of the finished product. Agile requires a cultural shift in many companies because it focuses on the clean delivery of individual pieces or parts of the software and not on the entire application.

Agile methodology that is widely used is Scrum.

Scrum.

Scrum is a A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value.

Scrum is:

* Lightweight
* Simple to understand
* Difficult to master

Scrum is a process framework that has been used to manage work on complex products since the early 1990s. Scrum is not a process, technique, or definitive method. Rather, it is a framework within which you can employ various processes and techniques. Scrum makes clear the relative efficacy of your product management and work techniques so that you can continuously improve the product, the team, and the working environment.

The Scrum framework consists of Scrum Teams and their associated roles, events, artifacts, and rules. Each component within the framework serves a specific purpose and is essential to Scrum’s success and usage.

Scrum is founded on empirical process control theory, or empiricism. Empiricism asserts that knowledge comes from experience and making decisions based on what is known. Scrum employs an iterative, incremental approach to optimize predictability and control risk.

Three pillars uphold every implementation of empirical process control: transparency, inspection, and adaptation.

Transparency

Significant aspects of the process must be visible to those responsible for the outcome. Transparency requires those aspects be defined by a common standard so observers share a common understanding of what is being seen.

For example:

* A common language referring to the process must be shared by all participants; and,
* Those performing the work and those inspecting the resulting increment must share a common definition of "Done".

Inspection

Scrum users must frequently inspect Scrum artifacts and progress toward a Sprint Goal to detect undesirable variances. Their inspection should not be so frequent that inspection gets in the way of the work. Inspections are most beneficial when diligently performed by skilled inspectors at the point of work.

Adaptation

If an inspector determines that one or more aspects of a process deviate outside acceptable limits, and that the resulting product will be unacceptable, the process or the material being processed must be adjusted. An adjustment must be made as soon as possible to minimize further deviation.

Scrum prescribes four formal events for inspection and adaptation, as described in the Scrum Events section of this document:

* Sprint Planning
* Daily Scrum
* Sprint Review
* Sprint Retrospective

## **Uses of Scrum**

Scrum was initially developed for managing and developing products. Starting in the early 1990s, Scrum has been used extensively, worldwide, to:

1. Research and identify viable markets, technologies, and product capabilities;
2. Develop products and enhancements;
3. Release products and enhancements, as frequently as many times per day;
4. Develop and sustain Cloud (online, secure, on-demand) and other operational environments for product use; and,
5. Sustain and renew products.

Scrum has been used to develop software, hardware, embedded software, networks of interacting function, autonomous vehicles, schools, government, marketing, managing the operation of organizations and almost everything we use in our daily lives, as individuals and societies.

As technology, market, and environmental complexities and their interactions have rapidly increased, Scrum’s utility in dealing with complexity is proven daily.

Scrum proved especially effective in iterative and incremental knowledge transfer. Scrum is now widely used for products, services, and the management of the parent organization.

The essence of Scrum is a small team of people. The individual team is highly flexible and adaptive. These strengths continue operating in single, several, many, and networks of teams that develop, release, operate and sustain the work and work products of thousands of people. They collaborate and interoperate through sophisticated development architectures and target release environments.

Quality Control and management

Total Quality Management (TQM) is the management approach used for quality control and management. It describes a management approach to long–term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work.

It is a method by which management and employees can become involved in the continuous improvement of the production of goods and services. It is a combination of quality and management tools aimed at increasing business and reducing losses due to wasteful practices.

**Principles of TQM**

1. **Management Commitment**

Plan (drive, direct)

Do (deploy, support, participate)

Check (review)

Act (recognize, communicate, revise)

1. **Employee Empowerment**

Training

Suggestion scheme

Measurement and recognition

Excellence teams

1. **Fact Based Decision Making**

SPC (statistical process control)

DOE, FMEA

The 7 statistical tools

TOPS (Ford 8D – team-oriented problem solving)

1. **Continuous Improvement**

Systematic measurement and focus on CONQ

Excellence teams

Cross-functional process management

Attain, maintain, improve standards

1. **Customer Focus**

Supplier partnership

Service relationship with internal customers

Never compromise quality

**Steps to implement TQM**

**1. Choose Control Subject**: Control subject must consist mainly of product and process characteristics set out in specifications and producer manual etc. Control subject must not be biased in nature and it must represent a great number of acceptable criteria for our justification etc.   
**2. Establishment measurement**: After we have selected the control subject, what follow is the establishment measurement, which is done by actual performance of goods & services. The measurement standard can be specified through defining frequency of measurement, the way the data will be recorded, the format for recording such data and person that will be held responsible for the making of such measurements.  
**3. Establish standard of performance**: For each control subject chosen, it is mandatory to stabilize and establish a standard of performance i.e. the performance of good quality, target and objectives have to be evaluated. This is the primary goals for product reliability and durability etc.  
**4. Measure actual performance**: One of the most critical steps in TQM is to measure the actual performance of a product or using the process. measurement (equipment) tools such as thermometer, clocks, yard and weight scale, other include data system and computer etc and compare it with standard of performance. a value judgement is necessary to drawn a conclusion from the scenario etc  
**5. Interpret actual and standard performances**: Comparing actual performance of the product & the standard performance as to determine if the product conform to the quality goals or not etc. The comparison is necessary to see if there is any likely differences or variability exist at all in the performance indicator etc.  
**6. Take corrective action**: In a well functioning TQM system, actuation is needed to stimulate actions and to restore conformances to requirements. It could be an official computer or a calibrated knob for adjusting a machine tool, or even a memorandum to subordinates. Corrective actions are needed by applying quality improvements measures or tools to restore conformance to requirements and also to ensure product quality reliability & durability.

**Benefits.**

* **Cost reduction**. When applied consistently over time, TQM can reduce costs throughout an organization, especially in the areas of scrap, rework, field service, and warranty cost reduction. Since these cost reductions flow straight through to bottom-line profits without any additional costs being incurred, there can be a startling increase in profitability.
* **Customer satisfaction**. Since the company has better products and services, and its interactions with customers are relatively error-free, there should be fewer customer complaints. Fewer complaints may also mean that the resources devoted to customer service can be reduced. A higher level of customer satisfaction may also lead to increased market share, as existing customers act on the company's behalf to bring in more customers.
* **Defect reduction**. TQM has a strong emphasis on improving quality within a process, rather than inspecting quality into a process. This not only reduces the time needed to fix errors, but makes it less necessary to employ a team of quality assurance personnel.
* **Morale**. The ongoing and proven success of TQM, and in particular the participation of employees in that success can lead to a noticeable improvement in employee morale, which in turn reduces employee turnover, and therefore reduces the cost of hiring and training new employees.