

# Project Management

## Beneficial For

Persons who would like to gain knowledge about project management field, project team member practitioners new to project management, and the persons who are related to project management team.

## ➤ Summary

Software project management is an umbrella activity within software engineering. It begins before any technical activity is initiated and continues throughout the definition, development, and support of computer software.

**Four P's** have a substantial influence on software project management—people, product, process, and project. People must be organized to perform software work effectively. Communication with the customer must occur so that product scope and requirements are understood. A process must be selected that is appropriate for the people and product. The project must be planned by estimating effort and calendar time to accomplish work tasks, defining work product, establishing quality check points, and establishing mechanisms to monitor and control work defined by the plan.

## Introduction

Project management is the discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. A project is a temporary and one-time endeavor undertaken to create a unique product or service. This property of being a temporary and a one-time undertaking contrast with processes, or operations, which are permanent or semi-permanent ongoing functional work to create the same product or service over-and-over again. The management of these two systems is often very different and requires varying technical skills and philosophy, hence requiring the development of project management.

The first challenge of project management is ensuring that a project is delivered within the defined constraints. The second, more ambitious, challenge is the optimized allocation and integration of the inputs needed to meet those pre-defined objectives. The project, therefore, is a carefully selected set of activities chosen to use resources (time, money, people, materials, energy, space, provisions, communication, quality, risk, etc.) to meet the pre-defined objectives.

## ....➔ **Project Management:**

The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

## ....➔ **Project Manager:**

A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

## ....➔ **Triple Constraints:**

Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

## ....➔ **The Critical path:**

Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

....➔

## The Project Manager

Project management is quite often the province and responsibility of an individual project manager. This individual seldom participates directly in the activities that produce the end result, but rather strives to maintain the progress and productive mutual interaction of various parties in such a way that overall risk of failure is reduced.

A project manager is often a client representative and has to determine and implement the exact needs of the client based on knowledge of the firm he/she is representing. The ability to adapt to the various internal procedures of the contracting party, and to form close links with the nominated representatives, is essential in ensuring that the key issues of cost, time, quality and above all, client satisfaction, can be realized.

In whatever field, a successful project manager must be able to envisage the entire project from start to finish and to have the ability to ensure that this vision is realized.

Any type of product or service - buildings, vehicles, electronics, computer software, financial services, etc. - may have its implementation overseen by a project manager and its operations by a product manager.

According to Project Management Body of Knowledge (PMBOK Guide), the project manager is the person responsible for accomplishing the project objectives, managing a project includes:

- Identifying requirements
- Establishing clear and achievable objectives
- Balancing the competing demands for quality, scope, time and cost
- Adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders.

Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors. High quality projects deliver the required product, service or result within scope, on time and within budget. The relationship among these factors is such that if any one of three factors changes, at least one other factor is likely to be affected. Project managers also manage projects in response to uncertainty. Project risk is uncertain event or condition that, it occurs, has positive or negative effect on at least one project objective.

## Key Features

....→ **Project Management:**  
The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

....→ **Project Manager:**  
A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

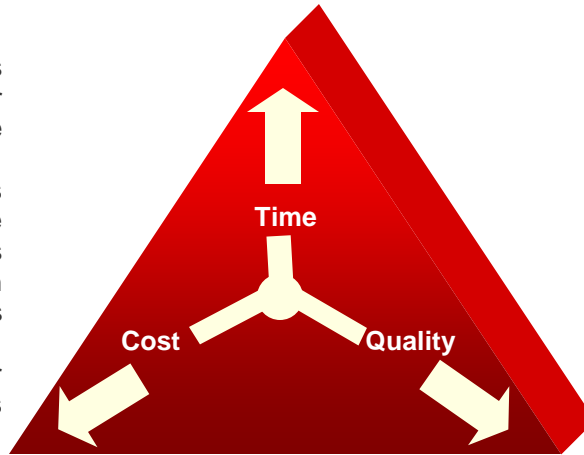
....→ **Triple Constraints:**  
Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

....→ **The Critical path:**  
Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

....→

## Scope Triangle

Like any human undertaking, projects need to be performed and delivered under certain constraints. Traditionally, these constraints have been listed as: scope, time, and cost. This is also referred to as the Project Management Triangle where each side represents a constraint. This triangle illustrates the relationship between three primary forces in a project. Time is the available time to deliver the project, cost represents the amount of money or resources available and quality represents the “fit-to-purpose” that the project must



achieve to be a success. The normal situation is that one of these factors is fixed and the other two will vary in inverse proportion to each other. For example “Time” is often fixed and the “Quality” of the end product will depend on the “Cost” or resources available. Similarly if you are working to a fixed level of “Quality” then the “Cost” of the project will largely be dependent upon the “Time” available (if you have longer you can do it with fewer people).

A phenomenon known as “scope creep” can be linked to the triangle too. Scope creep is the almost unstoppable tendency a project has to accumulate new functionality. Some scope creep is inevitable since, early on; your project will be poorly defined and will need to evolve. A large amount of scope creep however can be disastrous. When the scope starts to creep, new functionality must be added to cover the increased scope. This is represented by the quality arm of the triangle, representing the ability of the ‘product’ to fulfill users’ requirements. More requirements fulfilled = a better quality product. In this situation you have three and only three options:

1. Add time – delay the project to give you more time to add the functionality
2. Add cost – recruit, hire or acquire more people to do the extra work
3. Cut quality – trade off some non-essential requirements for the new requirements

If the art of management lies in making decisions, then the art of project management lies in making decisions quickly! When faced with scope creep you cannot ignore it. You need to tackle it in one of the ways described above (more later) and the sooner the better. Delaying raises the risk of your project failing. A poor project manager will see the scope triangle as a strait-jacket by which their project is irrevocably constrained.

A better project manager will make better use of one or more of the axes and will shift the emphasis in the project to one of the other axes. The best project managers will juggle all three like hot potatoes and will make decisions every day which effectively trade-off time vs. quality vs. resources. Project life cycle is shown in following figure:

## Key Features

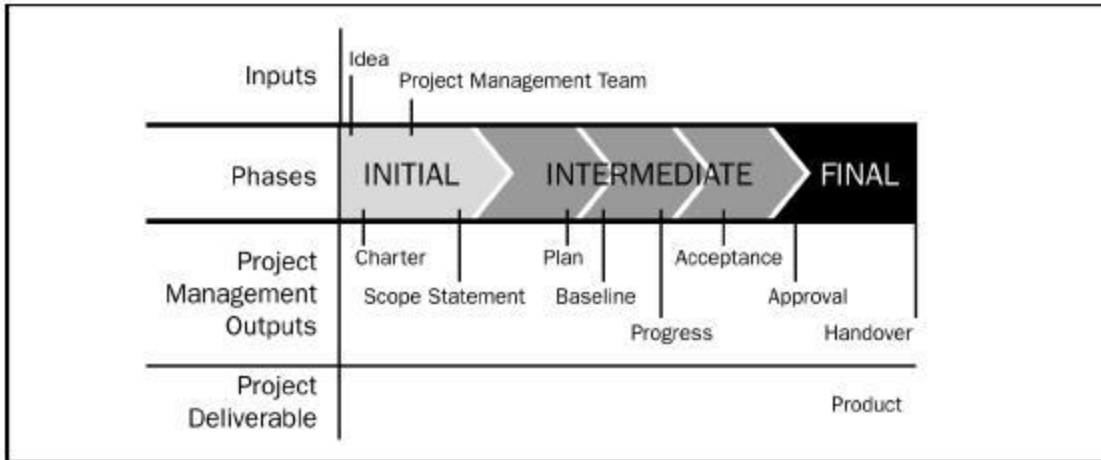
....> **Project Management:**  
The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

....> **Project Manager:**  
A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

....> **Triple Constraints:**  
Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

....> **The Critical path:**  
Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

....>



Typical Sequence of Phases in a Project Life Cycle

### The Critical Path

Another important concept in planning projects is that of the critical path. If a project consists of a set of tasks which need to be completed, the critical path represents the minimum such set, the critical set. This might seem to be a contradiction since you might think completion of all tasks is necessary to complete a project; after all, if they weren't necessary they wouldn't be part of your project, would they? The critical path represents not the ideal set of tasks to be complete for your project, but the minimum set. It is this path that you must traverse in order to reach completion of your project on time. Other tasks while important to overall completion do not impact upon the final delivery for the project. They can therefore be rescheduled if time is tight or circumstances change. Tasks on your critical path however will affect the delivery time of the project and therefore should only be modified in extremis. In the following example the critical path is represented in bold.

### Key Features

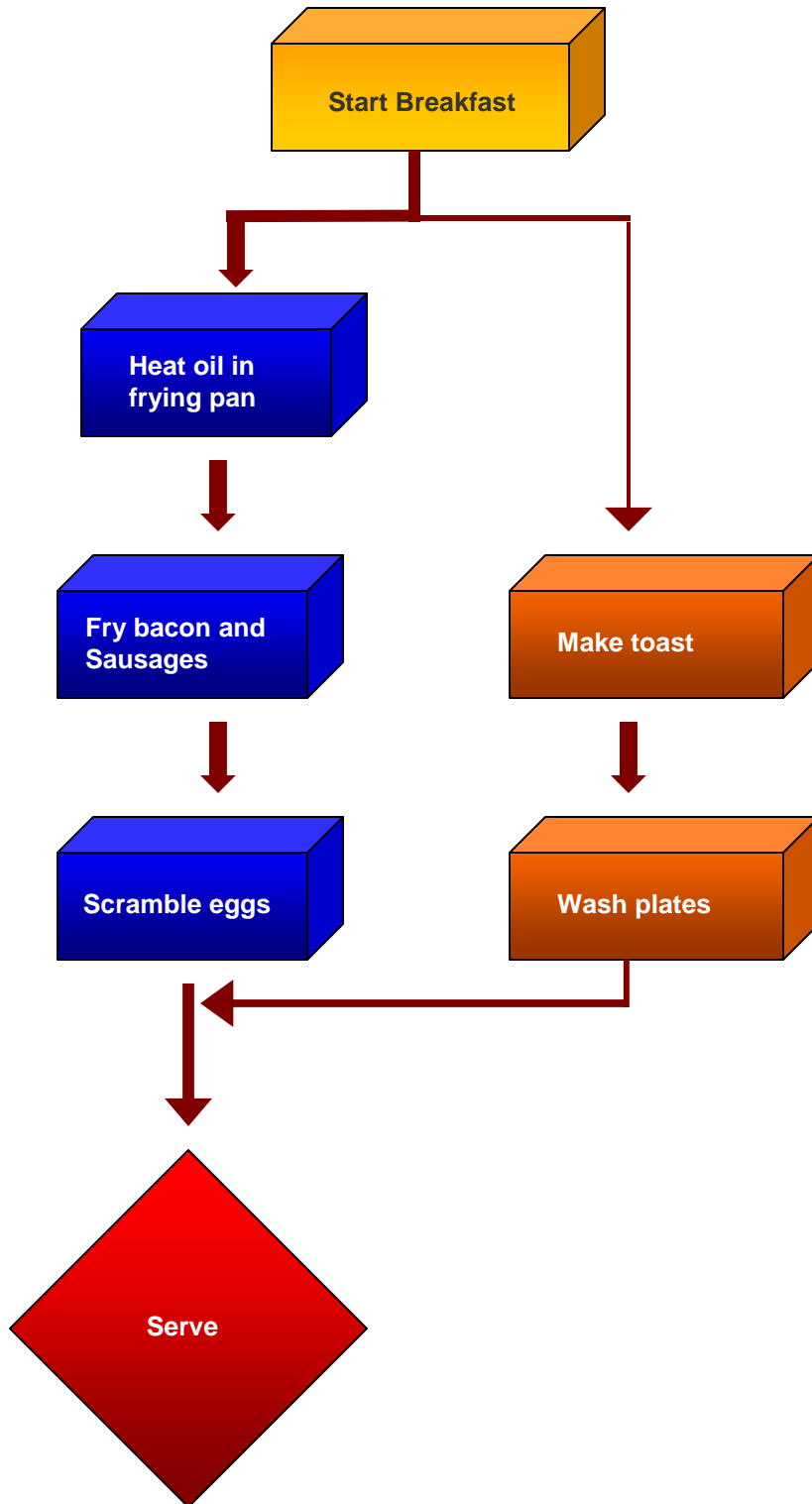
→ **Project Management:**  
The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

→ **Project Manager:**  
A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

→ **Triple Constraints:**  
Project managers often talk of a "triple constraint" – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

→ **The Critical path:**  
Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

→ evident truths about project management.



**Key Features**

....> **Project Management:**  
 The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

....> **Project Manager:**  
 A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

....> **Triple Constraints:**  
 Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

....> **The Critical path:**  
 Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

....> constraints.

**10 Axioms:**

**Nick Jenkins** (Pioneer in project management) has been suggested 10 self

In order to complete my project of cooking breakfast I have to go through the steps of frying bacon and sausages and scrambling eggs. The tasks “make toast” and “wash plates”, while important, are not time-dependent or as critical as the other three tasks. I can move either of those tasks but if I try to move anything on the critical path its going to delay the project. Ideally I’d like to have toast with my breakfast but a) it’s not essential and b) it doesn’t matter where in the process it happens. If I make toast before or after scrambling my bacon, it makes little difference to the overall result. On the other hand I can hardly fry my bacon before the oil is hot, nor can I scramble my eggs before frying my bacon (they’d turn to glue). The critical path represents the critical sequence of events which must occur if I want to successfully complete my project. Normally major 'milestones' will be represented on the critical path and they will often occur when different threads of the project come together. For example in the diagram to the right my only milestone is when I serve the completed breakfast. At this point I will have finished my preparations and completed everything on both tracks. This is represented by a diamond in the diagram above. If I suddenly discovered I was late for work, I could cheerfully discard the optional “toast” component of my project, take the critical path instead and still achieve my original milestone of delivering breakfast (and maybe even make it to work on time!).

## Basic Principles for Successful Project Management

**Nick Jenkins** (Pioneer in project management) has been suggested following self evident truths about project management:

### I. Know your goal

It may sound obvious, but if you don’t have an end-point in mind you’ll never get there. You should be able to clearly state the goal of your project in a single sentence. If you can’t, your chance of achieving it is slim.

### II. Know your team

Your team is the most important resource you have available and their enthusiastic contribution will make or break your project. Look after them and make sure the team operates as a unit and not as a collection of individuals. Communications are vital! Invest time in promoting trust and ensuring that everyone knows what they have to contribute to the bigger picture. Dish out reward as well as criticism, provide superior working conditions and lead by example.

### III. Know your stakeholders

Spend time with your stakeholders. Stakeholders either contribute expert knowledge offer their political or commercial endorsement which will be essential to success. Shake hands and kiss babies as necessary and grease the wheels of the bureaucratic machine so that your project has the smoothest ride possible.

### IV. Spend time on planning and design

A traditional mistake is to leap before you are ready. When you’re under pressure to deliver, the temptation is to ‘get the ball rolling’. The ball is big and heavy and it’s very, very difficult to change its direction once it gets moving. So spend some time deciding exactly how you’re going to solve your problem in the most efficient and elegant way.

## Key Features

- ....→ **Project Management:**  
The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.
- ....→ **Project Manager:**  
A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...
- ....→ **Triple Constraints:**  
Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.
- ....→ **The Critical path:**  
Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.
- ....→ and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost

## V. Promise low and deliver high

Try and deliver happy surprises and not unpleasant ones. By promising low (understating your goals) and delivering high (delivering more than your promised) you:

- Build confidence in yourself, the project and the team
- Buy yourself contingency in the event that something goes wrong
- Generate a positive and receptive atmosphere

Consider : if everything goes right you will finish early everyone will be happy; if something goes wrong you might still finish on time ; if things goes really badly you might still not deliver what you anticipated but it will still be better than if you over-promised!

## VI. Iterate! Increment! Evolve!

Most problems worth solving are too big to swallow in one lump. Any serious project will require some kind of decomposition of the problem in order to solve it. You must pay close attention to how each piece fits the overall solution. Without a systematic approach you end up with a hundred different solutions instead of one big one.

## VII. Stay on track

You have an end goal in mind. You need to work methodically towards the goal and provide leadership (make decisions). This applies whether you're a senior project manager with a team of 20 or you're a lone web developer. Learn to use tools like schedules and budgets to stay on track. Consistency is what separates professionals from amateurs.

## VIII. Manage change

We live in a changing world. As your project progresses, the temptation to deviate from the plan will become irresistible. Stakeholders will come up with new and 'interesting' ideas, your team will bolt down all kinds of rat holes and your original goal will have all the permanence of a snowflake in quicksand. Scope creep or drift is a major source of project failure and you need to manage or control changes if you want to succeed.

This doesn't imply that there should be single, immutable plan which is written down and all other ideas must be stifled. You need to build a flexible approach that absorbs changes as they arise. It's a happy medium you're striving for - if you are too flexible your project will meander like a horse without a rider and if you are too rigid your project will shatter like a pane of glass the first time a stakeholder tosses you a new requirement.

## IX. Test Early, Test Often

Projects involve creative disciplines burdened with assumptions and mistakes. Sure you can do a lot of valuable work to prevent mistakes being introduced, but to err is human and some of errors will make it into your finished product. Testing is the best way to find and eliminate errors.

## Key Features

### → **Project Management:**

The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

### → **Project Manager:**

A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

### → **Triple Constraints:**

Project managers often talk of a "triple constraint" – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

### → **The Critical path:**

Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

### → **Project Management:**

The discipline of organizing and managing resources in such a way that these resources deliver all the work

### X. Keep an open mind!

Be flexible! The desired outcome is the delivery of the finished project to a customer who is satisfied with the result. Any means necessary can be used to achieve this and every rule listed above can be broken in the right circumstances, for the right reasons.

Don't get locked into an ideology if the circumstances dictate otherwise.  
Don't get blinded by methodology.  
Follow your head.

Focus on delivering the project and use all the tools and people available to you. Keep an eye on the schedule and adjust your expectations and your plan to suit the conditions. Deliver the finished product, promote its use, and celebrate your success and then move on to the next project.

### References :

#### Project Management Associations:

Several national and professional associations exist which has as their aim the promotion and development of project management and the project management profession. The most prominent associations include:

- The Association for Project Management (UK) ([APM](#))
- The Australian Institute of Project Management ([AIPM](#))
- The International Project Management Association ([IPMA](#))
- The Project Management Institute ([PMI](#))
- The International Association of Project and Program Management ([IAPPM](#))
- The International Project Management Commission ([IPMC](#))

### International Standards

- [A Guide to the Project Management Body of Knowledge](#) (PMBOK Guide)
- [APM Body of Knowledge 5th ed.](#) (APM - Association for Project Management (UK))
- [PRINCE2](#) (Projects IN a Controlled Environment)
- [P2M](#) (A guidebook of Project & Program Management for Enterprise Innovation, Japanese third-generation project management method)
- [V-Modell](#) (German project management method)
- [HERMES](#) (The Swiss general project management method, selected for use in Luxembourg and international organizations)
- [OPM3](#)

## Key Features

### → Project Management:

The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

### → Project Manager:

A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...

### → Triple Constraints:

Project managers often talk of a "triple constraint" – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.

### → The Critical path:

Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.

### → 10 Axioms:

**Nick Jenkins** (Pioneer in project management) has been suggested 10 self evident truths about project management.

## Professional Certifications

- [ISO 10006](#):1997, *Quality management - Guidelines to quality in project management*
- [CPM](#) ([The International Association of Project & Program Management])
- [ISEB Project Management Syllabus](#)
- [JPACE](#) (Justify, Plan, Activate, Control, and End - The James Martin Method for Managing Projects (1981-present))
- [Project Management Professional](#), [Certified Associate in Project Management](#), [PMI](#) certifications

## Key Features

- ....> **Project Management:**  
The discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.
- ....> **Project Manager:**  
A Person related to project management activities like identifying requirements, establishing clear and achievable objectives, adapting the specifications, plans and approach to the different concerns and expectations of various stakeholders, balancing the competing demands for quality, scope, time and cost, etc...
- ....> **Triple Constraints:**  
Project managers often talk of a “triple constraint” – project scope, time and cost – in managing competing project requirements. Project quality is affected by balancing these three factors.
- ....> **The Critical path:**  
Project consists of a set of tasks which need to be completed first; the critical path represents the minimum such set, the critical set.
- ....> **10 Axioms:**  
**Nick Jenkins** (Pioneer in project management) has been suggested 10 self evident truths about project management.

## About OTS Solutions

OTS Solutions is one of the leading offshore software development service providers, offering an array of IT related services to its clients across the globe.

Since our inception, we have steadily grown into a reputed provider of high-quality and cost-effective software development services. Our ability to evolve continuously and flexible approach towards the dynamic business world has helped us to gain success in short span of time. Today, OTS provides offshore as well as onsite software development services to its clients across the globe.