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# **Introduction to Project Management**

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# Introduction to Project Management

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## Course Content

Managing a project successfully is one of the key ingredients for success in any project. A project is said to be successful if it

- Is completed in time
- Meets the intent of the customer / consultant
- Meets the quality requirements / codes / standards
- Meets the Safety & Environmental requirements
- Is within the allocated cost

not necessarily in the same order.

All project teams aspire to meet the above, but not all of them succeed, nor do the successful ones succeed always. Mismanaged projects spoils the reputation of the organization, apart from eroding the profit margins. On the contrary, a successful project enhances the reputation of the organization, which helps in bringing in new and/or repeat orders, increases the productivity of the staff (higher efficiency as a result of boosted morale) and last, but not the least, increases the profit margins or “bottom-line”. As the saying goes – **Nothing succeeds like success.**

Over a period of time, organizations tend to have a mixed record of success in projects. The better-managed companies have more number of successful projects as compared to the unsuccessful ones.

This brief write-up tries to find out the various challenges faced in the execution of successful projects.

## **Difficulties / Challenges in execution of a contract**

### **1. Timely Completion**

Completion of a project within the planned or stipulated period of time is one of the main challenges and decides whether the project is a success or failure. Most contracts lay emphasis on completion period with the clause – “Time is the essence of the contract”. In today’s fast world, the importance of Time (Read Money) needs no reemphasis. These days, projects have tighter completion schedules stretching the contractor as well as the suppliers, not to speak of the consultants, architects and the clients too in the process. A project completed in time, or for that matter ahead of time, gives the client the advantage of starting their business activity in time or earlier, thereby allowing them to start reaping the benefits of the project – could be in terms of direct or indirect profit.

For example – take the case of construction of a manufacturing facility – if the project is completed in time, the client starts his manufacturing in time, rolls out the product in time, starts selling the product in time and obviously starts receiving or reaping the benefits in time. A slight delay in the completion of the project can spark a series of delays down the line from advertising to marketing to product launch to stocking, etc. The client may even lose out on a “first-mover” advantage he/she would have planned, thereby allowing competition to take control of the market after which it may become more difficult to penetrate the market.

In view of the above, these days, most of the projects have penalties for delayed completion to act as a deterrent as well as a bonus clause for faster completion period to act as a motivator.

## 2. Cost Compliance

More often than not, projects are awarded to companies based on the lowest bid. This leads to severe competition and the successful bidder is always under continuous pressure on cost control. The estimation/sales/tendering team, in their enthusiasm to book orders, go very aggressive on costing and start assuming discounts regardless of whether the suppliers/sub-contractors are able to offer the same or not. The project execution team, on the other hand, also have targets to meet –  $x\%$  off the estimated cost! To meet this end, they start “squeezing” the suppliers/sub-contractors for more and more discounts, resulting in pressure all around!!! The key is to manage this pressure successfully and to deliver the project in time within or less than the budgeted figure and obviously, taking care of the quality and safety aspects as well.

## 3. Meeting Quality Standards

Completion of a project in time within the budgeted figure does not alone spell success. What the customer sees at the end of the project is Quality. The pains taken during the project, the difficult site conditions and/or weather conditions that might have existed during the project execution, the difficulties faced by the team in terms of approval, payments, clearances, etc., are all forgotten at the end of the project completion. We have been blessed with the ability to forget things and these are some of the things, that happen during the project execution cycle, which gets easily forgotten. What is remembered generally is the final product or the

project as is seen after the completion. It is indeed a big and difficult challenge to meet, if not exceed the quality requirements of the project.

More often than not, whenever there is a constraint on time and/or cost, the first to suffer would be quality. Speed and money can make people cut corners and hence a close monitoring of quality by a separate team is very important. Since every project is unique in its own respect, one should never lose focus on the aspect of quality.

#### **4. Environment, Health & Safety**

This is another area that has attracted lot of attention in the recent past. Respecting Mother Earth by taking care of the environment, respecting other living beings by ensuring their Health & Safety are our duties as good Citizens. These days most of the organizations have a separate independent department to handle this important area. Just like quality, this is another area, which gets ignored during project execution for the sake of speed and cost. Moreover, the value of human life cannot be measured. Hence, the need to address this properly. This aspect attains more importance in hazardous projects such as Oil Field projects, Off-shore drilling, high rise construction activities, nuclear power projects, etc. Environmental, Health & Safety (EH&S or HSE as is widely known) being a specialized subject, this article does not intend to cover this topic in detail. It's best left to a specialist who will be able to adequately cover the various important aspects of EH&S. Continuous training on Safety to all involved in the project is a must.

#### **5. Meeting the intent of the customer**

To meet the intent of the customer through the design made by the designer is the ultimate aim of the project. The customer's needs or

requirements are translated into a design by a consultant /engineer which in turn gets fulfilled by the construction team. Easier said than done !!! More often than not, as the project progresses, we see a “gap” in understanding between the client’s intent to what is understood by the contractor. A dedicated customer representative, preferably an experienced engineer helps in bridging or narrowing this “gap”.

The 5 points listed above are mutually inter-dependent dimensions of a project, which is essential for its successful completion. There are many bottlenecks and hurdles, which pose a threat to the success of any project. Listed below are some of the major ones.

(a) Achieving a balance between the various aspects like time, quality, cost, safety, etc.

As explained earlier, it’s prudent to appreciate and accept the fact that all of the various dimensions of a project like Time, Safety, Quality and Cost are interlinked and sacrificing one for the sake of the others will not augur well for the project. What’s important is to have the right balance. For example, a project can have the best of safety practices, but may not meet the completion schedule or cost constraints. Likewise, a project completed in time within the budget, may lack in safety aspects and probably would have added a long list of casualties. The key is to have the right balance.

The following examples should serve as eye-openers.

During the course of a project, the project team finds out that there has been a delay in ordering of major equipments and this would adversely impact the completion schedule. To cut corners, the project team starts

talking to vendors who can supply the equipments within a short span of time, but whose names do not appear in the approved list of vendors. These vendors were not in the approved list initially, for the simple reason that they didn't meet the quality norms. The contractor starts putting pressure on the consulting engineer/client for approval of the new vendor so that the project completion dates can be achieved. Meticulous planning at the initial stage of the project and a common vision of all concerned with respect to the various dimensions of the project enumerated earlier, will ensure that such things don't happen.

Similarly, by employing inferior quality sub-contractors (obviously, they must be cheaper!!!), may result in project delays and/or safety issues and/or re-work at a later date.

**(b) A good beginning**

More often than not, projects are booked on tight completion schedules. The marketing or sales team in their enthusiasm to bag an order, sometimes, go overboard and commit/accept very tight schedules. These tight schedules, though achievable, may be possible only by meticulous planning from day one of the project. Time is money and hence it's not unreasonable for a client to expect a fast completion. However, once the order is booked, there are handshakes and congratulations all around, and people tend to relax. The sales person might even take a break to celebrate. This may lead to delays in starting the project, which obviously has a chain reaction on the future events. The project team has to start off straightaway and start looking at the critical path and focus their attention failing which deadlines will be missed which in turn may lead to chaos right at the beginning of the project itself. As the saying goes – Well begun is half completed.

At the beginning of the project, the most crucial activities like scheduling of the project, design and engineering, deciding the sub-vendors or sub-contractors, ordering of major long delivery equipments, mobilization of manpower and site, etc., are done. Lot of efforts need to be put in at this stage to ensure a smooth progress of the site. Small mistakes made at this stage, results in larger irreparable deficiencies at a later date. A top-down approach from the higher management to instill the importance and gravity of the project at the starting phase can pave way for a proper functioning of the project. A kick-off meeting addressed by the key people can get the project on track early on.

### (c) Being prepared

Identification of the key people involved in a project like the Project Manager, Engineers, Supervisors, Draughtsman, etc., is one of the most important tasks for the management. Doing this important task without losing any time once the project is awarded is equally important. Normally, people are busy with their existing ongoing projects. The moment a new project is awarded, it's not practical to immediately deploy a new team as if they were waiting for this project to start off !!!

There's almost always a time lag between the time a project is awarded to the time the project team actually gets cracking on the job. This time needs to be minimized as much as possible. This period known sometimes as the "warm-up" period of the project is one of the critical phases. The management should give due importance to this phase of the project for the smooth functioning of the project team.

The sales team will be the first to know that a project is being awarded. Normally, there's always a small time frame or gap between the time this

information is known to the actual date on which an order is placed due to procedural formalities and documentation requirements at the client's end. Effective utilization of this small period of time is a very good method of being prepared in advance. Moreover, the first few meetings or key design activities should be initiated by the sales engineer/team with the project engineer to support him. Slowly, as time progresses, the project and/or planning team takes over and the sales team fades away from the scene to go back to his routine work. This results in a smooth transition. The sales team who have been "living" with the project for the past few weeks or months may know a lot about the project and hence are at a distinctly advantageous position to start off. The project team, on the other hand, has to start studying the contract, technical details, drawings, etc., and this takes some time, which when lost can be valuable. Moreover, the individual members of the project team maybe busy with an existing project even if it's under the final stages. No organization can afford to keep manpower idle and waiting for a new project to start. More often than not, they are "pulled out" from an existing site nearing completion.

#### (d) Allocation and Management of human resources

Typically, human resource allocation for a project is seen as a one-time exercise. At the beginning of a project, a team is appointed and then, left to handle the project. It is not uncommon to see projects getting into rough weather right at the beginning or fizzling out towards the end without proper completion. A proper manpower histogram should be drawn at the project planning stage itself to ascertain the actual requirement of people both at site and for back-office support. This should be made in line with the project schedule to ensure that there is synergy. Typically any project can be divided into 4 parts – the planning

stage, the procurement stage, the execution stage and the closing stage. More back-office manpower is required in the first 2 stages and more on-site manpower is required in the final 2 stages.

On similar lines, many times, the demobilization of the project team starts much before the actual completion of a project. This is probably necessitated due to the need to allocate this team to another new project site. The last portion of any project (the handing over phase or closing phase) requires people to ensure that the final handing over including Testing, Adjusting and Balancing (TAB) is done properly. Failing to do this can turn out to be disastrous and becomes the cause for dissatisfied customers. The other activities that form part of this last stage are the final documentation, training of the clients' operating personnel, supply of spares, arriving at the final contract value including reconciliation of measurements, submission of bank guarantees, issuance of warranty letters, etc.

### (e) Planning

As the saying goes, "Fail to plan, plan to fail". One of the key ingredients of success in any activity is planning. In many projects, there is a tendency to start activities much before planning is done. This will probably fetch short term results in terms of work progress, but in the long term, work done without proper planning may end up in delays, reworks, rectifications, wastage of time and money – In short, an unsuccessful project.

Proper planning / scheduling helps to identify critical paths, long delivery items, hurdles, constraints and provides opportunity to take corrective action before it becomes too late.

Identifying inter-face criticality is an equally important task. An example indicated below, would help to understand this better :

Imagine a project where large diameter pipelines have to be buried underground – i.e. below road crossings. The procurement and delivery of these pipelines very early in the project becomes important, so that the roadwork can be completed. Otherwise, one may end up doing additional breaking/making good of the roads. This will cost both time and money and quality may suffer too. Hence, even though the laying of pipelines may not be a big task, the extent of pipes that come under the road needs to be planned and procured earlier as compared to the rest.

#### (f) Acting at the right time

A project is a dynamic activity and demands action at the right time. Failure to take correction action at the right time, often lands the person in embarrassing or sometimes costly situations. For example, take the case of a project requiring air-conditioning equipment. Imagine a situation wherein the capacity of the unit selected is inadequate. This can be corrected only if this were to be checked at the design stage. If not done at the design stage, it may result in ordering of a wrong undersized unit resulting in inadequate cooling during peak summer when the need for air-conditioning is felt the most, thereby creating a situation of embarrassment. It may not be practical to change the unit unless large scale changes are made, which in turn may not only result in higher costs but also in related difficulties.

#### **The final learning lesson**

Well, to err is human – We all make mistakes and projects are no different. The key is to minimize the mistakes by a systematic planned execution procedure. Notwithstanding the same, there are chances that

some mistakes are committed during the project execution. Hence, the importance of the “post-mortem”, to analyze these mistakes and use it as a learning curve for the future projects.

There are many questions one can ask at the end of the project completion - Some of the pertinent questions which may help us to get things right at least the next time are:

- a) What were the positives of the project and why did they happen ?  
Were they “one-off” situations or were they strategised ?
- b) Similarly, what were the negatives of the project and why did they happen ? Were they “one-off” situations and how to ensure that they don’t happen again ?
- c) What were the surprises in this project? Why did it happen ?  
Were they identified at the right time ? If yes, what was the correction action taken?
- d) Was anything done differently ? and if yes, what were the results ?
- e) What were the main strengths ?
- f) Did the project maximize the strengths of the individuals and/or the project team ?
- g) What were some of the weaknesses that should be fixed ?
- h) Which products or processes could have yielded a better price and/or efficiency, if chosen/planned at the right time ?

- i) What was the wastage of materials, consumables & time ? Were they controllable ?
- j) What are the areas that are to be focused for cost and time optimization?

As the saying goes, failure is the stepping stone to success. One has to ask some of the above questions, if not more, before the project team embarks on their next project. The ability to do a self-introspection, analyze and take corrective action is a sure-shot way of achieving excellence.

It may not be a bad idea to compile the learnings from each project – both positive and negatives – which can in turn result in executing the next project in a better manner. In short, a compilation of the “best practices” adopted in the project along with the “difficulties” encountered can be used as a learning curve for the future benefit. Focus on the weak areas and strengthen the strong areas.