

**A CRITICAL ANALYSIS ON PROJECT MANAGEMENT
PROCESSES IN PUBLIC WORKS DEPARTMENT,
BANGLADESH**

Dissertation submitted in partial fulfillment of the requirements for the Degree of
Masters in Procurement and Supply Management

Submitted by

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Declaration

I hereby declare that the dissertation entitled “**A CRITICAL ANALYSIS ON PROJECT MANAGEMENT PROCESSES IN PUBLIC WORKS DEPARTMENT, BANGLADESH**” submitted to the BRAC Institute of Governance and Development (BIGD), BRAC University for the degree of **Masters in Procurement and Supply Management (MPSM)** is exclusively my own and original work. No part of it in any form, has been submitted to any other University or Institute for any degree, diploma or for other similar purposes.

Dhaka, August- 2018

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Certificate

This is my pleasure to certify that the dissertation entitled “**A CRITICAL ANALYSIS ON PROJECT MANAGEMENT PROCESSES IN PUBLIC WORKS DEPARTMENT, BANGLADESH**” is the original work of Saimum Hossain that is completed under my direct guidance and supervision. So far I know, the dissertation is an individual achievement of the candidate’s own efforts, and it is not a conjoint work.

I also certify that I have gone through the draft and final version of the dissertation and found it satisfactory for submission to the BRAC Institute of Governance and Development, BRAC University in partial fulfillment of the requirements for the degree of Masters in Procurement and Supply Management (MPSM).

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ABSTRACT

Procurement is a crucial area in the working functions of the government development activities. Public procurement plays a vital role in continuous development process of a nation . In Bangladesh it can contribute a lot in achieving the Vision 2021. Major portion of development projects fund spend through procurement .But the implementation of the development projects as well as procurement are facing some obstacles. The main objectives of the study is to assess the factors affecting the public procurement function at public Works Department under the ministry of Housing and Public Works in Bangladesh. Public procurement has become an issue of public attention and debate, and has been subjected to reforms, restructuring, rules and regulations. It is a matter of great responsibility and accountability for the procurement professionals to spend public money following rules and regulations. Cost overrun is a common phenomenon in the construction projects of Bangladesh. In addition to this, excessive time requirement is another problem to implement the development project. The successful delivery of Government's programs depends on minimizing project uncertainties which directly improves delivery times, quality and stays within the budget. Proper project planning and management can minimize the uncertainties in implementing the project successfully.

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Chapter-01: Research Objective

1.1 Introduction

Government is the main provider of essential services such as health, education, defense and infrastructure. In a developing country like Bangladesh people do not get these services as per requirement . So investigation of the core problems for failure of the programs is a must. In Bangladesh the Projects initiate with lots of enthusiasm and hope. Besides the stakeholders also have a high expectations from the development projects . But at the end of the day some projects can contribute very little to their desired changes. Ultimately most of the projects end up with failure. Time and cost overrun is the most common types of failure in these projects. Some of the projects become successful but ends up with lots of difficulties. So reasons behind the project failure should be addressed properly. The reasons could be Poor Tendering Procedure, Poor Contract Management, weak Project Planning etc.

Public Procurement often constitutes the largest domestic market in developing countries. So public procurement not only means spending public money but also it has huge significance on local industries. It also includes private and third parties who provide services directly to the government.

Public Works Department is one of the oldest departments in Bangladesh. During British era it was named as Public Works of Bengal(PWB).This department is one of the key stakeholders of the government . Because numerous construction projects are executed by this department. Time delay and Cost overrun is a very common phenomenon in executing of these project. Changing in Architectural Plan and scope of work during the execution phase is also very common here. There may be a lot of reasons behind this like lack of proper planning, nepotism, weak governance, inability of the professionals etc.

1.2. Statement of the Problem :

Government allocates necessary funds to implement projects every year. But after every fiscal year it is found that the funds allocated to different ministries are not spent as they meant to be and they are returned to the government exchequer. It indicates that there are some problems in implementation of the projects. This time delay leads to cost overrun due to increase in price of the raw materials. It has become very important to find out the root cause of the problems. These may include delay in preparation and approval of projects, inefficient project management, lack of human resource development, non involvement of people's participation ,inadequate domestic resource mobilization and delay in procurement process etc.

1.3. Objective of the study:

1. To examine the actual amount of delay in different .
2. To determine the causes of the delay .
3. To identify barriers responsible for poor implementation of the projects.
4. To recommend some options to improve the status of the projects.

1.4. Limitations of the Study:

Since the researcher is an employee of the Government so getting permission and covering of long distance was a limiting factor. The parameters of inefficiencies have been identified through qualitative data. But based on their statistical data their significance were not tested. Besides Lack of proper documentation and MIS system in public sector, data are scattered and sometimes it is difficult to link any missing link data.

Chapter 2: Project & Project Management

2.1. An Overview of the Project Management

Project management is an important management practice to achieve specific goals of the projects. Now a days questions have been raised on paying much attention on project management. Is there any differences between project management and general management of an organization? Despite lot of similarities there are tons of differences between them. Projects are more schedule-intensive than most of the activities that general managers handle (Lewis, 2007).

Many factors have to be managed such as resource, time ,budget and risk for successful implementation of the project. Now the question arises what is a project. The Project Management Institute (PMI) defines project as “a temporary endeavor undertaken to produce a unique product, service, or result” (PMI, 2013, p. 3). So it means that it is not a repetitive activity it should be done only once. In case of repetitive activity it is called an operation. A project must have budget, a definite starting and end point, a clearly defined scope of work etc. Every project has three variables to control.

1. Time
2. Resource
3. Money

Another important thing is that the scope of a project because it reflects everything within the project. “A project is a time and cost constrained operation to realize a set of defined deliverables (the scope to fulfill the project’s objectives) up to quality standards and requirements” (IPMA, 2006, p.13). Project management is the efficient management of the variables present in every project. It is all about how the project is managed efficiently with limited resource and time constraint along with limited project budget. According to Maylor, every project is unique; that is the exact project has not been performed before.

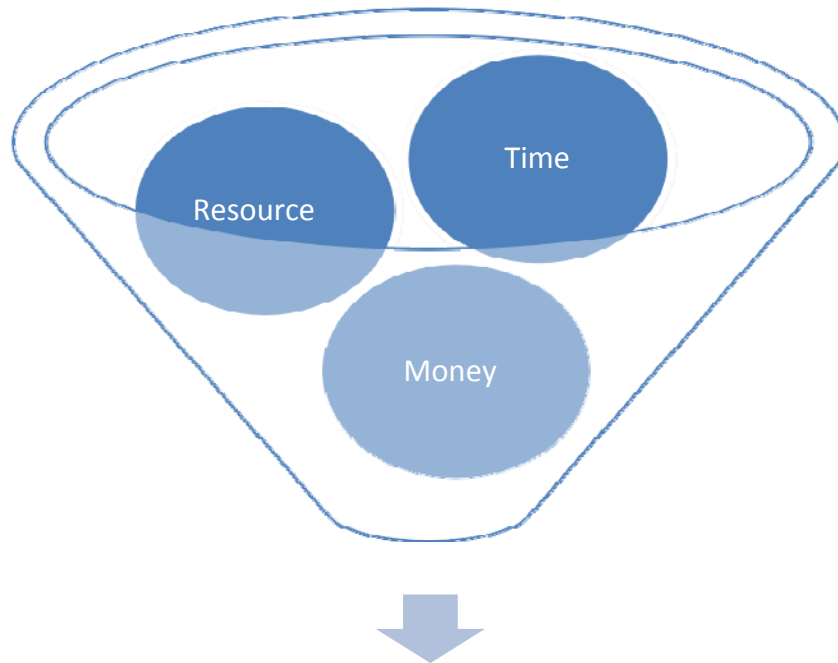


Figure 1: Project variables

2.2 Project management Phases:

A typical project consists of five different phases to complete.

1. Initiation phase
2. Planning phase
3. Execution phase
4. Monitoring phase
5. Completion phase

1. Initiation phase:

Initiation is the first phase of the project lifecycle. This is where the project's value and feasibility are measured. Project managers typically use two evaluation tools to decide whether or not to pursue a project:

Business Case Document – This document justifies the need for the project, and it includes an overview of potential financial benefits.

Feasibility Study – This is an evaluation of the project's goals, timeline and costs to determine if the project should be executed.

2. Planning phase :

During this phase a team should prioritize the project, calculate a budget and schedule, and determine the resources which will be needed. During this phase the team also gets direction for producing quality outputs, handling risk, creating acceptance, communicating benefits to stakeholders and managing suppliers. The process of developing the project plan varies from organization to organization, but according to Meredith and Mantel (2009), any project plan must contain the following elements:

- Overview
- Objectives or Scope
- General Approach
- Contractual Aspects
- Schedules
- Resources
- Personnel
- Risk Management Plans
- Evaluation Methods

3. Execution phase :

This phase is mostly associated with project management. It is mainly about providing deliverables that satisfy the customers. This is a good time to bring up important project related information. Execution depends mainly on planning phase. The work distribution of the team during the execution phase are derived from the project plan. The main inputs of this phase are the Project Team, Project WBS, Communication Plan, Risk Management Plan, Organization Chart, Responsibility Matrix, Project Notebook, Issues/Action Item Log, Status Reports, Project Schedule etc. and the expected outputs at after this stage are the Current and

Updated Project Schedule, Change Management, quality management, phase of sign etc. (Project management methodology guidelines, 2010).

4. Monitoring phase :

Sometimes monitoring combined with execution because they often occur at the same time. This phase mostly deals with measuring the performance and the progress of the project according to the project plan. Issues arise throughout the project that could cause change in scope to occur. Control of change is very important in overall project control system. Project managers should use the following process steps to control changes in scope (Project management methodology guidelines, 2010):

- Evaluate Scope Change Requests
- Assess Scope Change Impact
- Taking Corrective Action
- Review Status with Owner
- Update Project Plans and Schedule

For maintaining the guaranteed deliverables teams must monitor the activities to prevent scope creep, calculate key performance indicators and track variations from allotted cost and time.

5. Completion phase :

The project is closed when the team delivers the finished one to the customer communicating to stakeholders and releasing resources to other projects. This is a very crucial step because it allows the team to evaluate and document the project and move on the next one. The activities of this phase also ensure that best practices are captured and can be shared, and that continuous improvement on both team and personal levels is practiced (Project management methodology guidelines, 2010).

Inputs: Inputs of this phase are

- ❑ Completed, up-to-date project schedules
- ❑ All project documentation
- ❑ Quality Checklists
- ❑ Phase Sign-offs, as appropriate

Outputs: Outputs of this phase are

- ❑ Post Implementation Review
- ❑ Performance Evaluations
- ❑ Lessons Learned
- ❑ Project Evaluation
- ❑ Delivery of Final Documentation
- ❑ Project Sign-Off
- ❑ Customer Satisfaction Survey
- ❑ Administrative Closure
- ❑ Survey the Project Participants
- ❑ Conduct Post Implementation Review
- ❑ Develop Lessons Learned

Successful project management is the sum of efficient management of all these phases.

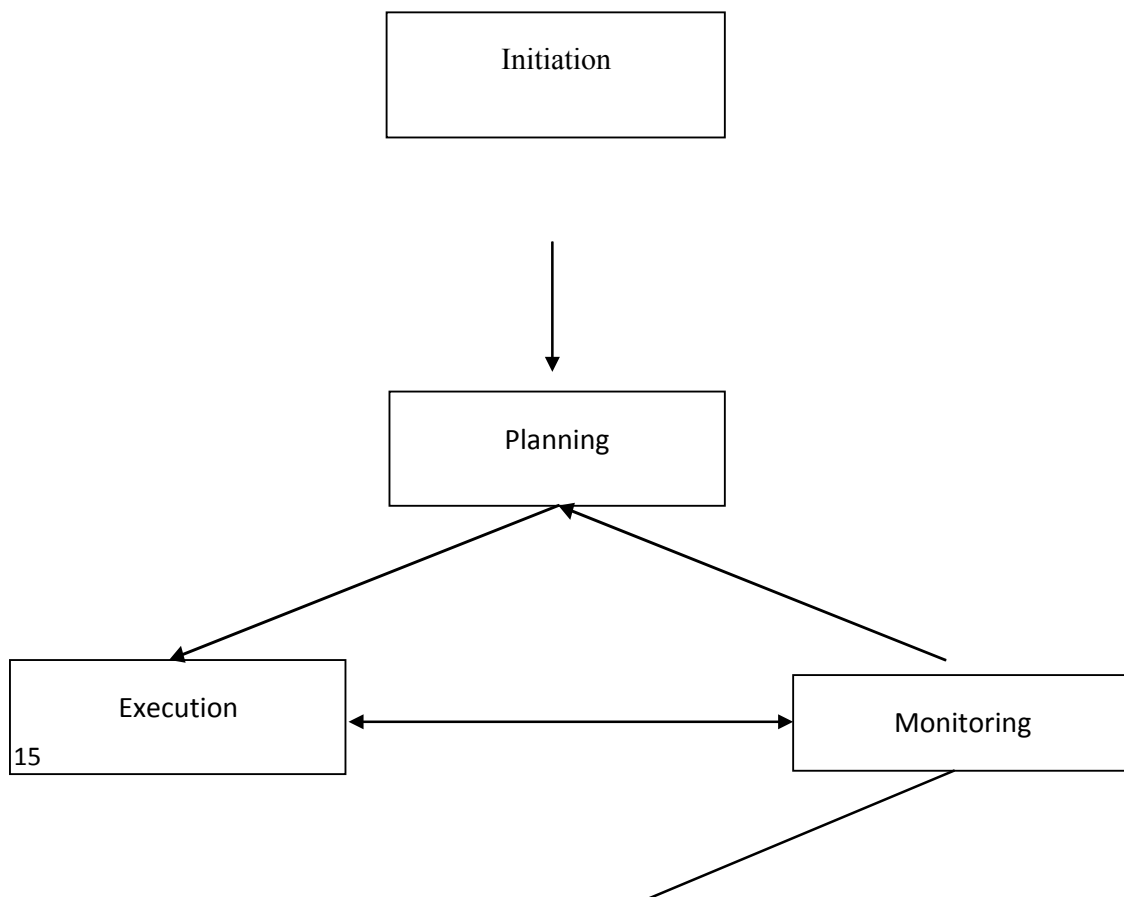


Figure 2 : Phases of Project Management

2.3 Terminologies used in Project Management:

The following terminologies are very much related with project management and most often used by professionals of project management.

Work breakdown structure (WBS): is a deliverable oriented decomposition of a project into smaller components.

Stakeholders: Any individual or group with an interest in the project process or outcome, (Maylor, 2010, p. 77).

Triple constraints: this is managing time, cost and other resources of a project in a way that will keep the project scope in a balance.

Baseline: approved plan for a project or schedule in the project

Scope: this is all the works that constitute the project.

Milestone: selected key events on the project base on their importance

Activity: individual works that constitute the project.

Program: “a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually” (PMI, 2013, p. 9).

The life cycle of a project: the series of phases or activities that a project passes through from the beginning to the end.

Duration: The numbers of minutes, hours, days, months, or years use to complete an activity in a project.

Project portfolio: “a collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives” (PMI, 2013, p. 9).

Process: “set of interrelated or interacting activities which transforms inputs into outputs” (ISO, 2003, p. 2).

2.4 Project environment:

This is the environment where the project generally takes place. It represents a connection where the project is processed. It impacts on project which is provided by numerous factors as operational, physical, ecological, social, cultural, economic, pshycological, organizational etc. The Project environment can be analyzed from three perspectives:

1. Project Time Environment
2. External Project Environment.
3. Internal Project Environment.

So it can be said that project environment is dynamic and has a high probability to change during a projects lifecycle. The problem is that it makes the management of the project difficult. Project manager can identify , analyze and understand changes in the project environment .

Project Time Environment:

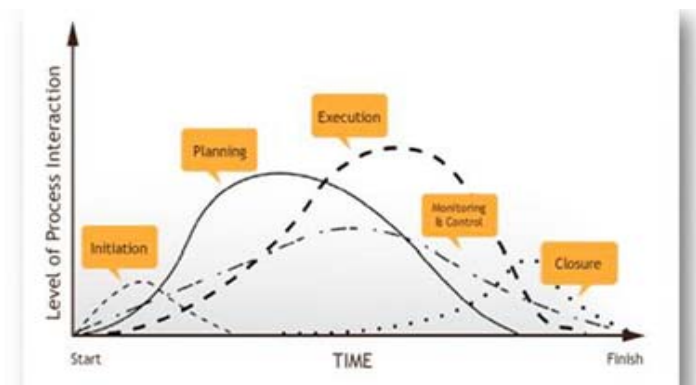


Figure 3: Relationship Between the project Time Phases (PMBOK)

Each of the project phases can be broken down and treated as individual projects. While the senior managers and project manager mostly handles the project initiation but when subdivided it can be considered as a full project. It is temporary and time bound. If at any point in time during the project the planning was inadequate due to lack of understanding of the project time environment ; this can lead to budget and time overrun even if the project is

in its final stage .(A Guide to the Project Management Body of Knowledge: PMBOK Guide)

External Factors: There are numerous ways by which project external environment can be analyzed by Project Managers. One of them is SLEPT.

S- Social

L-Legal

E-Economic

P-Political

T-Technological

It is a very useful tool to analyze the project environment and to identify the elements that could affect the smooth operation of the project.

Socially the lifestyle of the people is a very important factor. Social factors like peoples nature ,choice ,demographics influence the success of the project.

If the legal system of the environment is transparent then the stakeholders gain confidence that the project will not face any time overrun due to potential litigation .

Usually projects become successful where the political environment is stable. Project environment becomes unsafe where the political environment is unstable.

Internal Factors: Mckinsey and co. developed a 7-S of project management from which the internal factors were actually adopted. The project manager can understand the internal factors by analyzing these elements.

| <i>Element</i> | <i>Description</i> |
|----------------------|--|
| Strategy | The high-level requirements of the project and the means to achieve them |
| Structure | The organisational arrangement that will be used to carry out the project |
| Systems | The methods for work to be designed, monitored and controlled |
| Staff | The selection, recruitment, management and leadership of those working on the project |
| Skills | The managerial and technical tools available to the project manager and the staff, and how these are developed |
| Style/culture | The underlying way of working and inter-relating within the work team or organisation |
| Stakeholders | Individuals and groups with an interest in the project process or outcome |

Table-01 : The 7-s of Project Management (Maylor,2010,p.28)

2.5 Project Lifecycle: Project lifecycle consists of different phases. Besides different authors or institutions have their own theories on project phases. Actually project lifecycle means a series of activities that the project goes through beginning to end maintaining a sequence. Meredith and Mantel developed three phases of a typical project:

startup phase
middle phase and
ending phase

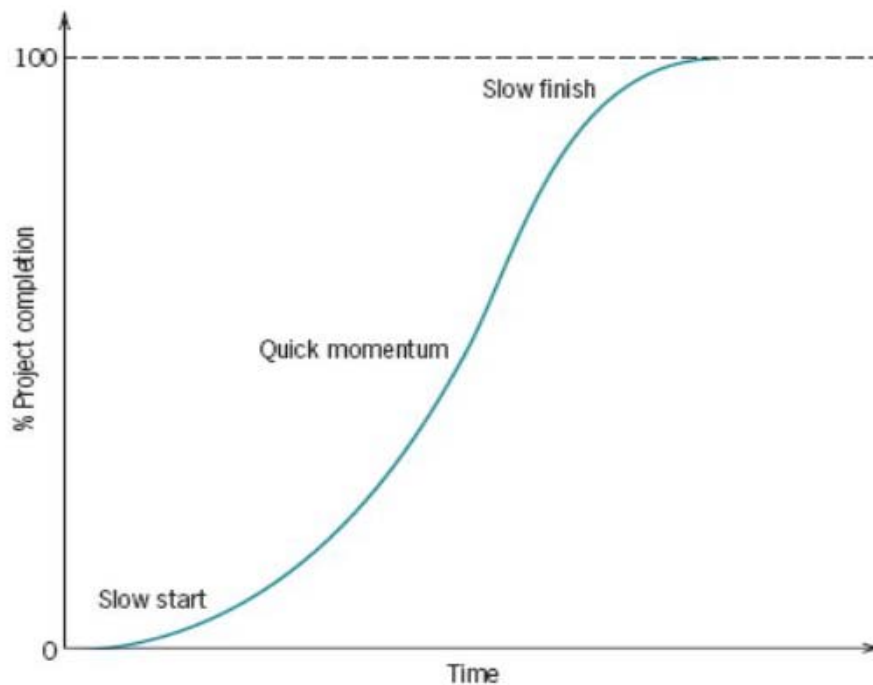


Fig 4: Project Management Lifecycle (Meredith & Mantel, 2009).

Project Management Institute also identified some stages of project lifecycle like starting the project , organizing and preparing , carrying out the project work and closing the project.

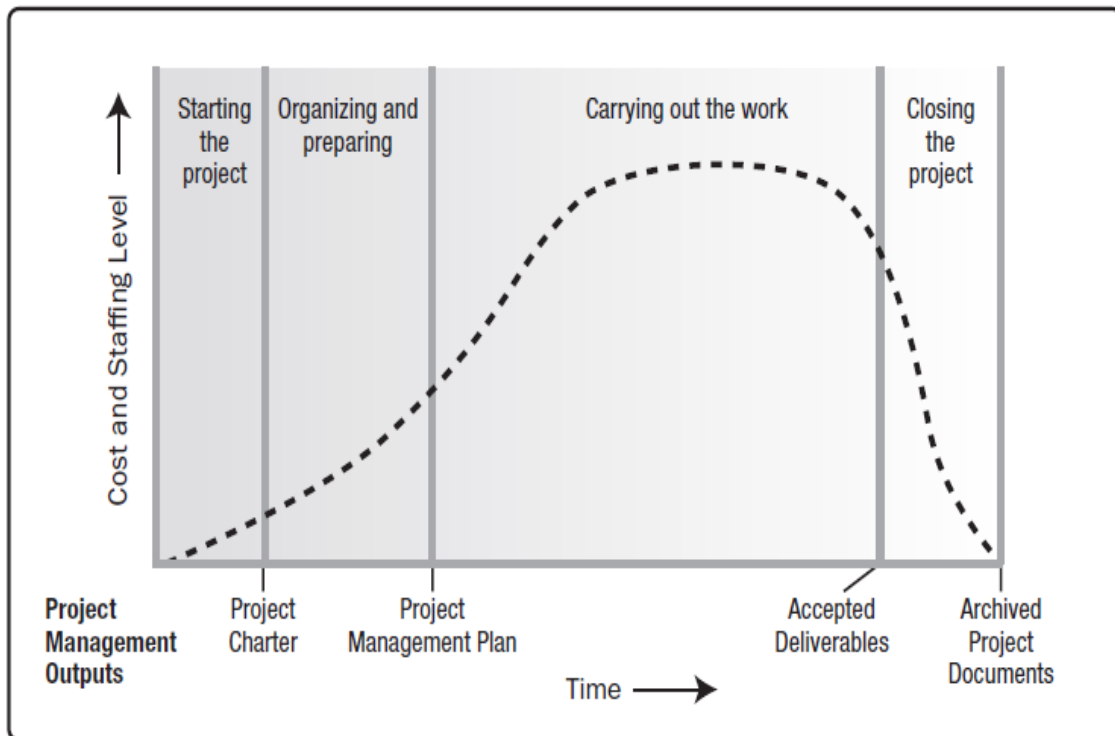


Figure 5: Cost and staffing levels across a generic Project life cycle.(PMI,2013, p. 39)

From the figure we can clearly see that these stages are to the project cost and staffing. During the beginning of the project these levels are generally low and reaches its peak during the execution and declines when the project comes to an end. So it is very clear that risk is higher in the implementation phase. It is also important that during the initiation and planning stage opinions and demands of the stakeholders should be carefully considered.

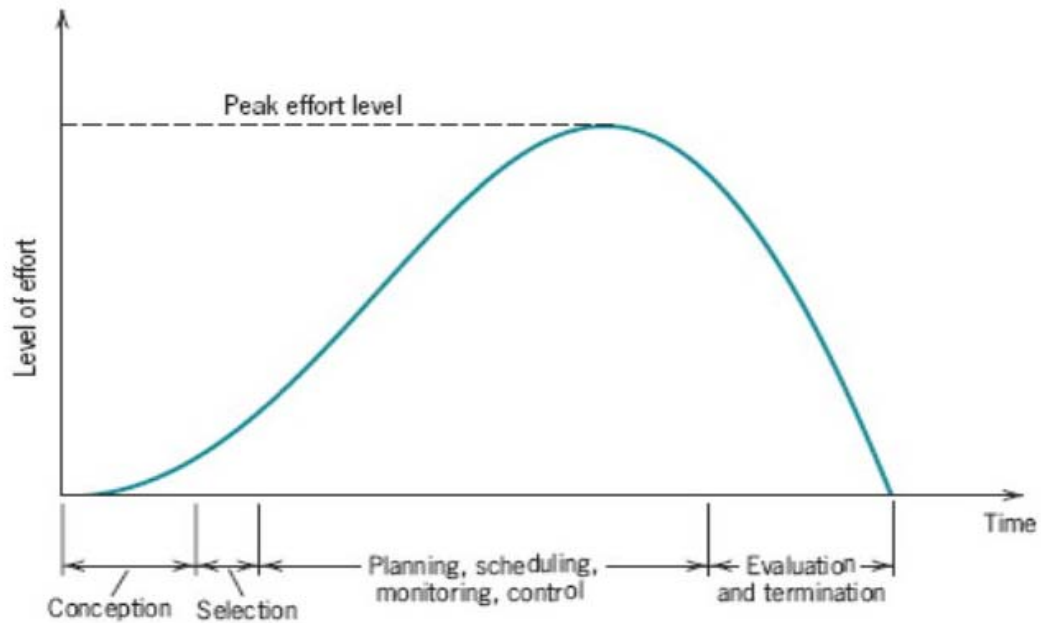


Figure 6: Time distribution of project effort (Meredith & Mantel, 2009).

Maylor also identified four stages of project lifecycle which is commonly known as 4D.

These are :

- **Defining the project**
- **Designing the project**
- **Delivering the project**
- **Developing the project**

2.6 Role of Project Manager:

The project manager is an individual responsible for delivering the project though the specific duties of project manager vary from industry to industry, company to company. According to Lewis, “the primary responsibility of the project manager is to ensure that all work is completed on time, within budget and scope, and at the correct performance level” (Lewis, 2007, p. 24). It indicates that the project manager should possess certain skills to get

the job done in an efficient way as per requirement of the sponsor. As well as the formal responsibilities set out in methods such as PRINCE2, the project manager has an important role in interfacing between the project and the business area. In addition to management

skills, the project manager has to exercise leadership role for a successful completion of a project. According to Parker, “Leadership is the art of getting others to want to do something that you believe should be done” (Packard, 1962, cited in Lewis, 2007, p. 29).

2.7 Managing the Constraints: For many years project managers have been encouraged to look to the Triple Constraints to provide a framework to plan, monitor and control a project. PMBOK defines these constraints as “a framework for evaluating competing demands.” (PMI, 2004, p. 378). But some authors also developed some constraints like Wysocki identified five constraints that every project faces in its life cycle and they are Scope, Quality, Cost, Time and Resources.

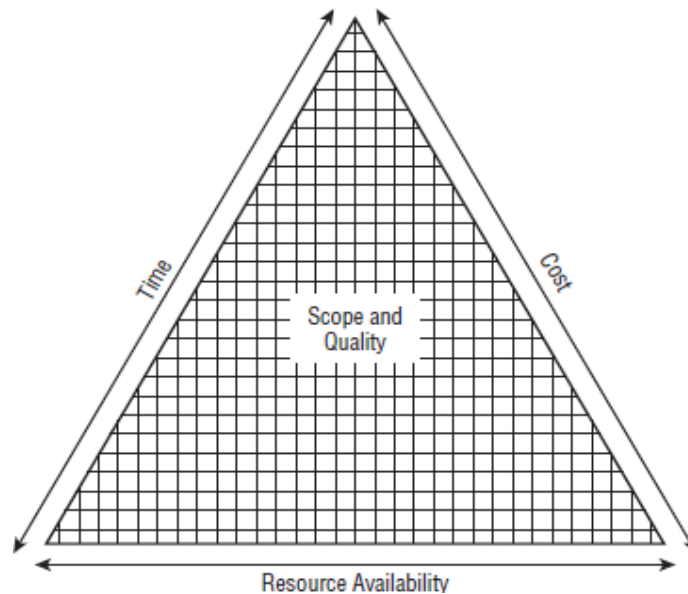


Figure 7 : The scope triangle. (Wysocki, 2009, p. 13).

Project constraints are also considered to be somewhat mutually exclusive . In the project management triangle ,it is assumed that making a change to one constraint will affect one or both of the others.

Chapter 3: Project Management Knowledge Areas

3.1 Knowledge Areas

In their fifth edition PMI identified ten knowledge areas of project management that should be considered by the project managers for carrying out the project work successfully. Another purpose of these knowledge areas is to better organize the different processes of the project. According to PMBOK these knowledge areas are

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resources Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management and
- Project Stakeholder Management

But we will now discuss on Project integration management, Project Scope Management, Project Time Management, Project Cost Management, Project Risk Management.

3.2 Project Integration Management

This is the only project management knowledge area that has processes in each five process groups. According to PMBOK guide “Project Integration Management includes the processes and activities to identify, define, combine, unify and coordinate the various

processes and project management activities within the Project Management Process Groups” . According to the PMI (2013) Project Integration Management includes the following processes:

- Develop project charter
- Develop project management plan
- Direct and manage project execution
- Monitor and control project work
- Perform integrated change control
- Close project or phase.

Develop project charter

The project charter is a document that formally authorizes the project. It is very important that each project should have a project charter. Generally this is done by working with other stakeholders that states the purpose of the project. This the description of the project goals and deliverables of the project. Besides the project manager is also identified by the charter and it gives the PM authority to manage resources for the project.

For external project it establishes agreement between the project sponsor and the project team. In case of internal project the charter is also used to establish internal agreements for better deliverables.

Develop project management Plan

This can be said as the master plan of the project which means all planning documents of the project like define, prepare, integrate, and coordinate all subsidiary plans in the project. This is

the basis of all the tasks that need to be performed in the project. This is the summary of other management plans that provides a quick overview of the entire project. It provides project baselines for schedule, scope and cost. According to (Jarocki, 2014) it includes the change management elements such as :

- A communications management plan
- A risk management plan (that includes organizational and user adoption risks)
- A stakeholder management plan (including the need to manage user adoption needs)
- A project sponsorship plan
- Activities required for assessing organizational readiness

3.3 Project Scope Management

Project scope management deals with the processes of defining and documenting all the work that is required to successfully complete a project. Project scope refers to all the work involved in creating the product, service or result of the project and the processes used to create them. The *PMBOK® Guide* (PMI, 2013a) states: —Project Scope Management includes the processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully □ (p. 105). The Scope of a project is its essence — it determines what the project is all about, the deliverables that are to be provided, and the groundwork upon which the project team shall build. The main objective of scoping the project is to ensure that the project team and stakeholders have the same understanding of what product, service or result will be produced by the project and what processes will be used in achieving that goal. These processes include the following:

Collect requirements: This is the process of defining and documenting stakeholder needs to meet project objectives. This is a part of the Planning process group.

Scope definition : This is the process of developing a detailed description of the project and its ultimate product. This is also a part of the Planning process group.

Creating the work breakdown structure (WBS) : This process involves breaking down the project into smaller, more manageable components. Falls under the Planning process group

Scope verification: The process of formalizing acceptance of the complete project deliverables. Its a part of the Monitoring and Controlling process group.

Scope control : Involves monitoring project status and product scope as well as managing changes to the approved scope baseline. Part of the Monitoring and Controlling process group.

3.4. Project Time Management

Time is something we all wish we had more of and this may be especially true if we are in charge of a big project. Project time management is the efficient use of time by means of good organization, efficient productivity and proper planning. It is the process of planning and controlling the amount of time needed to finish a specific activity in a project. That means that, it includes both planning and controlling components of project management.

The *PMBOK® Guide* (PMI, 2013a) states: —Project Time Management includes the processes required to manage the timely completion of the project□ (p. 141). Project managers who are responsible for the projects should use the time management skills to finish their work in the most efficient way possible. The PMI in their fifth edition identified seven time management processes that can be followed for a successful completion of a project. These are:

Define activities: This is the process of identifying and documenting the specific actions to be performed to produce the project deliverables.

Sequence activities: The process of identifying and documenting relationships among the project activities

Estimate activity Resources: The process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity.

Estimate activity Durations: The process of estimating the number of work periods needed to complete individual activities with estimated resources .

Develop schedule: The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.

Control schedule: The process of monitoring the status of project activities to update project Progress and manage changes to the schedule baseline to achieve the plan (PMI, 2013) .

By following these steps Project Manager can come up with a plan like network diagrams to control and regulate the project.

Network Diagrams: It is a very important tool to show the sequence in which project works are carried out. Here we can see an activity on node network diagram-

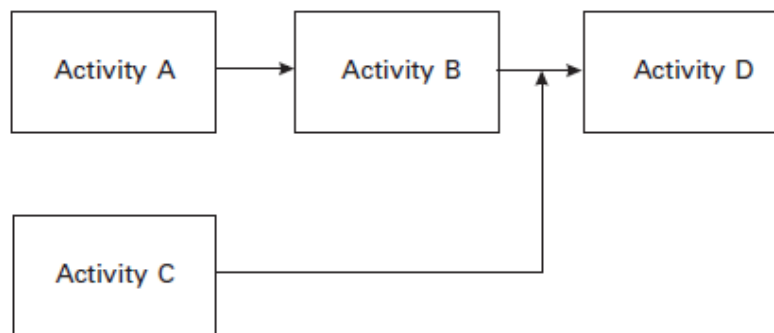


Figure 8 : Activity-on-node.(Source Lewis ,72,p.72)

In activity-on-node above, task A is done before B, and B is done before D, while Task C is done in parallel with A and B. The work is shown as a box or node, and the arrows show the sequence in which the work is performed. “Events are not shown in activity-on-node networks unless they are milestones - points in the project at which major portions of the work are completed” (Lewis, 2007, p. 72).

3.5 Project Cost Management

Cost management is concerned with the process of planning and controlling the budget of a project or business. It includes activities such as planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. The cost management function maintains its important focus at every stage throughout the life cycle of a project. It can affect the end result by either not meeting the performance requirement set by the sponsor or a total cancellation of the entire project if not carefully managed. Kerzner identified some tools and techniques for project budgeting and they are –

- Recent experience in similar work
- Market and industry surveys
- Estimating software and databases if available
- Knowledge of the operations and processes
- Professional and reference material
- Interviews with subject matter experts (Kerzner, 2009).

According to PMI there are some major processes for cost management. They are –

Resource Planning: Determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.

Cost Estimating: Developing an approximation (estimate) of the costs of the resources needed to complete project activities.

Cost Budgeting: Allocating the overall cost estimate to individual work items.

Cost Control: Controlling changes to the project budget.

3.6 Project Risk Management

Project risk management is the process of identifying, analyzing and then responding to any risk that arises over the life cycle of a project to help the project remain on track and meet its goal. Risk can be defined as the “uncertainties that may negatively affect the project by challenging the project’s constraints or parameters (Mintzer, 2002, p.158). The *PMBOK® Guide* (PMI, 2013a) states: —Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project (p. 309).

The following figure depicts a Project Risk Management Overview according to PMI organization (PMBOK).

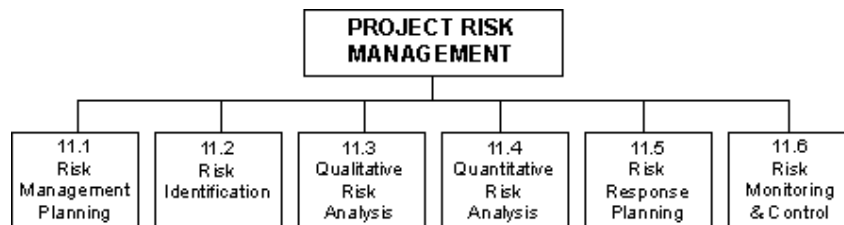


Figure 9 : PMI's Project Risk Management Overview

A common and systematic approach to risk management suggested by Turnbaugh (Turnbaugh, 2005), has three basic stages:

- Risk Identification – determining the types of risks, identify, and assess the potential risks in the project.
- Risk Quantification – the probabilistic characteristics and the degree of the impacts for their impacts.

- Risk Response and Development Control – defining opportunities for managing changes in risk during the project life cycle.

Project Risk Identification:

The first step in project risk management is to identify the risks that are present in the project. Two main sources exist to identify risks and they are people and paper. According to Maylor, project risk identification is the process of predicting the key risk outcomes – indicators that something is going wrong in a project (Maylor, 2010, p.220).

The identification of risk can be developed by engagement of stakeholder throughout the project lifecycle.

Project Risk Quantification:

This is the process of analyzing the identified risks in the project in order to determine their level of impact on the project. Project risk assessment can be done by a number of ways including qualitative and quantitative analysis. Quantitative analysis is the use of mathematical method to determine the likelihood of an event occurring. This is a form of numerical calculations such as percentage of probability of an event occurring.

Project Risk Response:

The last step in project risk management process is to monitor, control and review risks. , according to PMI (2000), the primary objectives of the last step in the project risk management is to track identified risks, monitor residual risks, identify new risks and also ensure that risk responses plans are executed. For instance, “the risk of a critical activity running late can be reduced either through reduction in the scale of the activity or by ensuring that there is sufficient buffer at the end of the project to deal with the outcome – the project being delayed” (Maylor, 2010, p. 222).

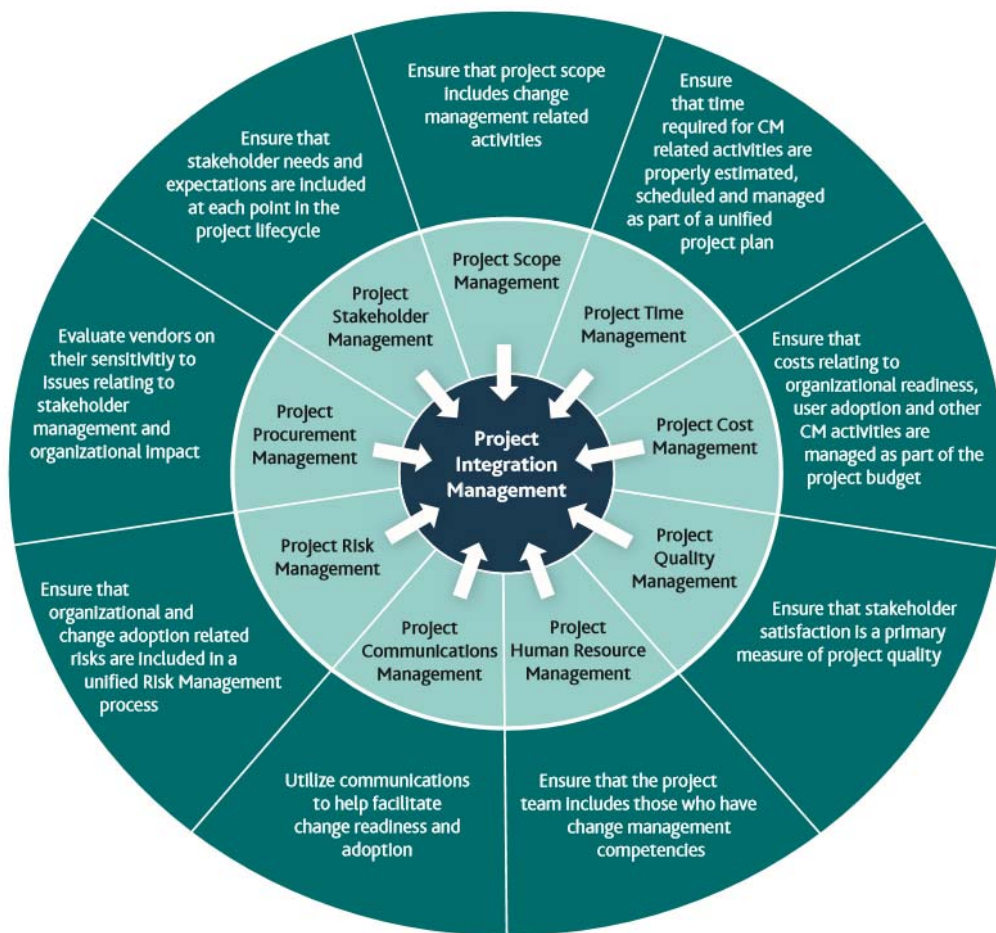


Figure 10 : Knowledge areas of project management and their functions (Jarocki, 2014).

Chapter 4: Evaluation of Time Management Processes

4.1. Evaluation Objective

The objective of the study was to evaluate the following :

1. Find out the actual amount of time delay or percentage of delay by analyzing the data of the projects.
2. Find out the amount or percentage of cost deviation of the projects.
3. Find out the root causes of the problems.

4.2. Work Plan and Methodology

No primary data was used in this study. It was totally done on the basis of secondary data. All data were collected from the respected working divisions of Public Works Department. We consulted with the respective executive Engineers, sub-divisional Engineers and assistant engineers of the divisions. All collected data was analyzed using Microsoft Excel.

The work stages are:

- Meeting the supervisor and preparation of research plan.
- Consulting with PWD officials.
- Collecting data from different working divisions.
- Analyzing the data manually
- Writing the report with the results and recommendations
- Submission of the report

4.3. Data Collection Methods

This is one of the most critical stages of the study. Data was collected from different PWD divisions .Most of the informations were gathered from PCR(Project Completion Report) and DPP(Development Project Proposal). The projects were selected randomly but these projects represent the current performance of the projects in public sector of Bangladesh.

4.4. Selection of Projects

Seven projects were selected randomly under different ministry. These projects have different categories like one of them is umbrella project and another one is a deposit work based project etc. The projects were under Ministry of power, energy and mineral resources, Ministry of housing and public works, Prime Minister's Office, Ministry of Social Affairs and Ministry of home affairs of Bangladesh.

Chapter 5: Results and Discussions

5.1 Description of the sample

Seven projects of different pattern were selected randomly under the Ministry of power, energy and mineral resources, Ministry of housing and public works and Ministry of home affairs of Bangladesh.

5.2. Data Analysis

Microsoft Excel software was used for analyzing the data.

5.3. Results

Cost overrun of the examined projects:

Table 2 (Figure 1) shows the happening of cost overrun in 03 (three) projects out of 7 (seven). 100 % cost overrun happened incase of project 6. Cost overrun involves unexpected costs incurred in excess of budgeted amounts due to an underestimation of the actual cost during budgeting. Cost overruns are common in infrastructure, building, and technology projects. The 7 projects we selected have different amount of cost overrun.

Table 2 : Cost overrun of different projects

| Sample Project | Cost overrun % |
|----------------|----------------|
| Project 1 | 0 |

| | |
|-----------|-------|
| Project 2 | 0 |
| Project 3 | 13.27 |
| Project 4 | 0 |
| Project 5 | 0 |
| Project 6 | 100 |
| Project 7 | 40 |

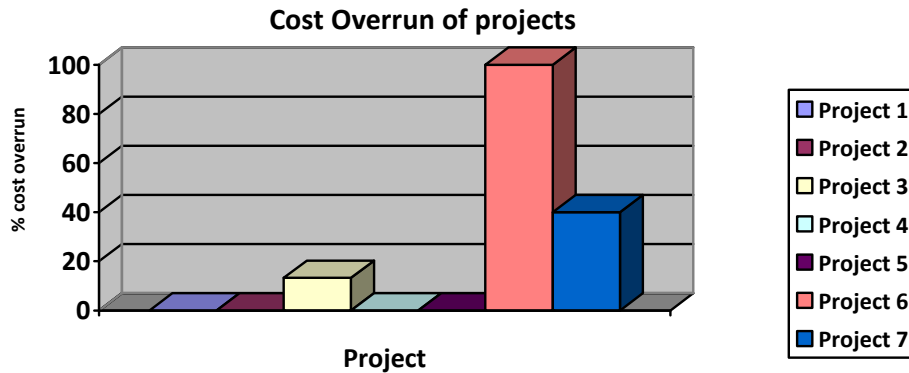


Figure 11 : Cost overrun of different projects

Time overrun of the projects:

Table 2 (Figure ...) shows the time overrun happening of 07 (seven) construction projects of PWD. Out of 07 only 04 projects have implemented within stipulated time. On the other hand implementation time has been extended for 03 projects. The amount of time overrun is 43%. But in case of Project 3 and Project 7 the amount of time overrun is alarming.

The time overrun in construction projects has become one of the most common problems in the industry that cause multitude of negative effects on the projects and its stakeholders.

Table 3: Time overrun of different projects

| Sample Project | Time overrun % |
|----------------|----------------|
| Project 1 | 66.67 |
| Project 2 | 0 |
| Project 3 | 167 |
| Project 4 | 33 |
| Project 5 | 0 |
| Project 6 | 0 |
| Project 7 | 114 |

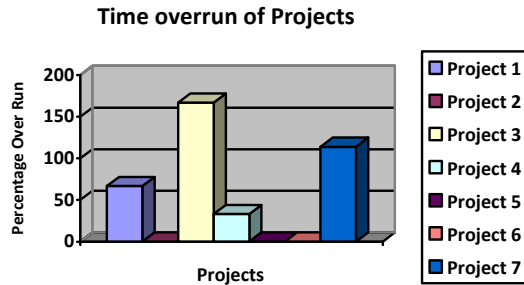


Figure 12 : Time overrun of different projects

Time overrun in construction projects has become a worldwide status quo.

Relation between cost of the project and time overrun:

The history of the construction industry worldwide is full of projects that were completed with significant time and cost overruns. A defined relationship cannot be established between the cost of the project and time overrun due to small sample size but a random trend can be seen in the data pattern.

Table 4: Relationship between time overrun and cost of the projects

| Sample Project | Cost of the project (BDT) | Time overrun % |
|----------------|---------------------------|----------------|
| Project1 | 10617.26 | 66.67 |
| Project2 | 2428.38 | 0 |
| Project3 | 936.38 | 167 |
| Project4 | 3006.66 | 33 |
| Project 5 | 4048.08 | 0 |
| Project 6 | 4971.72 | 0 |
| Project 7 | 18121.2 | 114 |

Highest time overrun occurred in the third project which is 167%. Though the cost of the project is lowest among seven of them but time overrun is highest . This is unusual . Because this type of time overrun occurs in the big budget projects.

On the other hand the lowest time overrun is 0 in the second project. It is a single centred project with moderate amount of budget. This is the only project which finished in due time. So it can be said that the project was under special supervision so that it can not exceed the anticipated time limit.

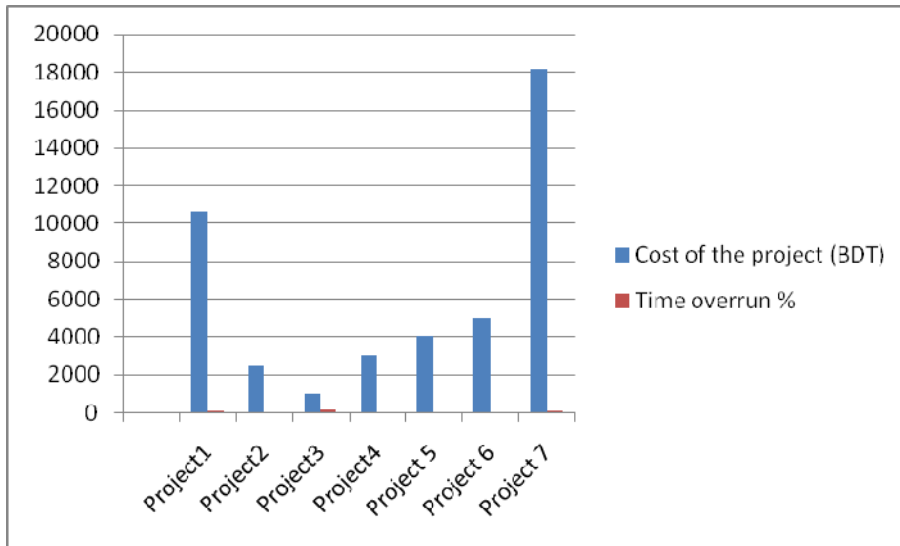


Figure 13. Relationship between time overrun and cost of the projects

Relation between cost of the project and time overrun:

Time and Cost overrun is very closely associated with one another. Sometimes delays and cost overrun is found in the very early stage of the project and sometimes it is found in the middle of the project. Here it is seen that highest time overrun occurred with the highest cost deviation in project 3. So it can be said that due to massive time overrun cost of the materials and other associated cost also increased. So it became difficult for the Project Team to finish the project within the initial budgeted cost of the project.

Table 5: Relationship between time overrun and cost deviation

| Sample Project | Cost deviation% | Time Overrun% |
|----------------|-----------------|---------------|
| Project1 | 0 | 66.67 |
| Project2 | 0 | 0 |
| Project3 | 13.27 | 167 |
| Project4 | 0 | 33 |
| Project 5 | 0 | 0 |
| Project 6 | 100 | 0 |
| Project 7 | 40 | 114 |

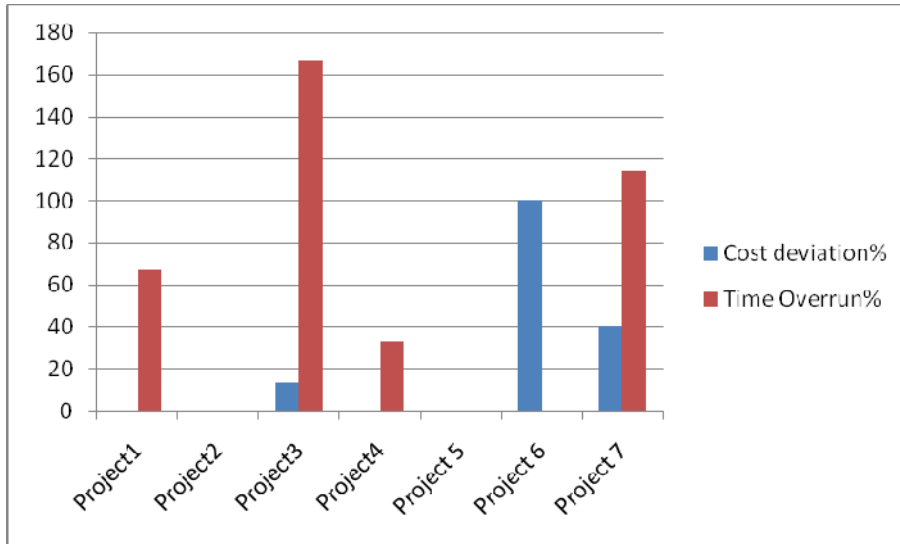


Figure 14: Relationship between time overrun and cost deviation

In case of Project 1 time overrun is 66.67% but cost deviation is 0. This is a deposit work. It can be said that according to IRON TRIANGLE Time overrun is minimized by adjusting cost and quality which is also applicable for project 3 where time overrun is 33% and cost overrun is 0%.

In case of Project 2 no time and cost overrun were occurred. The reason may be is that the project was held in the premises of the Supreme Court and the project team was very concerned on time and cost deviation of the project. So it is clearly said that time deviation is the major problem in the public projects which consequently introduce cost deviation.

Reasons for time overrun :

From the collected data some reasons for time delays were found:

1. Inaccurate Planning and Scheduling of Projects

This is one of the most critical part of the projects. In Most cases project time failure occurs due to inaccurate planning and scheduling. During planning inaccurate calculation of lead time causes the problem .

2. Insufficient fund flow

For a successful project completion adequate fund flow is a very important factor. But in public projects of Bangladesh sometimes this type of situation arise for various reasons. This

was a very common practice in government projects but now a days the situation has been developed.

3. Non availability of land

This type of situation develops mostly in umbrella projects. Sometimes delay in land acquisition occurs at 1 center which consequently delays the whole project.

4. Delay in approving extra work and variation

Extra work and variation is worldwide problem in construction projects due to some last minute decision change by the client or changes in the architectural drawing. But in most of the government projects in Bangladesh approval of the variation takes a lot of time resulting time delay in the project.

5.Lack of coordination between parties

This is a very common problem in the government projects of Bangladesh. Because in most cases more than two parties get involve in the project and due to lack of proper coordination, inefficiencies and lack of trust between the parties causes time overrun in the projects.

6.Fluctuations of prices of materials

In Bangladesh raw materials of construction projects are directly linked to the world market. Due to that reason price fluctuation of raw materials is very common. When price of the raw materials goes up the pace of the project slows down by the contractors and most of the cases project time schedule gets failed.

7.Unforeseen ground condition

Sometimes ground conditions are not in a favorable condition for construction works like a very low land or in the hilly area of the country. Sometimes the land also occupied by unwanted people which creates time delay in the project.

8.Poor liquidity of contractors

Sometimes the contractors get so many works in hand which creates liquidity crisis of the contractors . Due to lack of liquidity contractors miss the schedule of the projects which creates time delay.

Chapter 6: Summary and Recommendations

6.1. Summary

Successful project completion is a very stressful and challenging job. Efficient project management will ensure that the client receives a product that meets their expectation. Successful project management requires strict supervision and wide range of activities. From initiation or planning to the closure of the project, all of the ten basic functions or activities should be properly managed in order to deliver a successful project.

The study investigated the current time and cost overrun factors in PWD and future scope for improvement of the projects. From data analysis it is very clear that most of the projects in PWD suffers due to time extension or overrun. Various reasons also discussed over here. However a compact and effective project management planning may reduce the time delay and other effects .

6.2. Limitations:

Due to some unavoidable circumstances there were certain limitations of the study:

- The sample size was very small compared to the number of projects performed by PWD every year. Due to lack of proper documentation data collection of this huge number of projects become very difficult.
- The study is based on actual project related information. No survey or other methods were adopted.
- Due to small sample size it became very difficult to reach a concrete decision or solution.
- The study was done on the basis of time and cost related data. Manual errors may exist that may affect the result.

6.3. Challenges:

Some major challenges for effective project management in PWD is identified during the study and they are :

- Inaccurate Planning and Scheduling of Projects
- Frequent design changes
- Delays in decision making
- Poor project management
- Insufficient fund flow
- Non availability of land
- Unrealistic contract duration and requirements imposed
- Lack of contingency plan for emergency situation
- Incomplete design at the time of tender
- Lack of communication between parties
- Effect of weather
- Mistakes and errors in design
- Lack of proper skill on project management

6.4. Recommendations:

Based on the collected information, data analysis and on international practice some recommendations for better project management are:

- PWD should form a unit assigned with the task of maintaining a database which would maintain information pertaining to the past performance of the contractors.
- Some advanced planning tools should be introduced in PWD like Program analysis and review technique (PERT), Critical Path Analysis (CPA), Graphical Evaluation and Review Technique (GERT) etc.
- Expedite the approval process strictly adhering to the existing procedure.
- Improve the existing process of monitoring and controlling in order to have close inspections at appropriate stages to detect potential problems in time and to draw immediate attention of higher management.

- Increasing delegation of financial and administrative power at lower level to make the process more smoother.
- Decentralisation of financial authority and administrative authority is very much necessary for umbrella projects. In cases of large umbrella projects centralized system may be helpful for cost reduction for bulk procurement . But decentralization of authority makes the project management more smoother.
- Should consider a contingency plan in case of any emergency situation develops. Sometimes a plan B is very effective for project completion.
- Creating a very competent project team is very important for successful project management.
- The clients ,PWD and contractors should keep themselves abreast of recent developments in construction management and contract law by undergoing training programs and workshops.

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Appendix

Projects:

Project 1:

Name: Construction of 13-Storeyed Head Office Building with Two Basements of Gas Transmission Company Limited (GTCL) at Sher-e-Bangla Nagar administrative area, Agargaon, Dhaka.

Administrative ministry/ division: Ministry of Power, Energy & Mineral Resources/ Energy & Mineral Resources Division.

Executing Agency: Gas Transmission Company Limited (GTCL) and Sher-e- Bangla Nagar P.W.D. Division 2.

Location of the Project: Sher-e-Bangla Nagar, Dhaka Metropolitan Area, Dhaka

Implementation Period:

Date of commencement:

Original: 01/07/2012

Actual: 01/07/2012

Date of completion:

Original: 30/06/2015

Actual: 30/06/2017

Time overrun % of original time: 66.67%

Cost:

Original: 10848.31 lakh Taka

Latest revise: 10848.31 lakh Taka

Actual expenditure: 10617.26 lakh Taka

Cost overrun % of original cost: 0%

Project 2:

Name: Internal infrastructural development of Bangladesh supreme court.

Administrative ministry/ division: Ministry of Housing and Public Works.

Executing Agency: P.W.D. Division 4 ,Dhaka.

Location of the Project: Ramna, Dhaka Metropolitan Area, Dhaka.

Implementation Period:

Date of commencement:

Original: July 2016

Actual: July2016

Date of completion:

Original: June 2017

Actual: June 2017

Time overrun % of original time:0%

Cost:

Original: 2466.91 Lakh Taka

Actual expenditure: 2428.38 lakh Taka

cost overrun % of original cost: 0%

Project 3:

Name: Establishment of 06(Six) Nos. Vocational Training center in six Division for the Orphan and Disable Boys and Girls .

Administrative ministry/ division: Ministry of Social Affairs.

Executing Agency: Department of Social Services and PWD

Location of the Project: Patuakhali.

Implementation Period:

Date of commencement:

Original: July 2005

Latest revise: January 2006

Actual: January 2006

Date of completion:

Original: June 2008

Latest revised: June 2011

Actual: June 2013

Time overrun % of original time:167%

Cost:

Original: 1082.16 Lakh Taka

Latest revise: 978.63 lakh Taka

Actual expenditure: 936.38 lakh Taka

cost overrun % of original cost: (-) 13.27%. Tk. 145.78lakh saved.

Project 4:

Name: Construction and Re-construction of 54 Old and Dilapidated Fire Service and Civil Defence Station

Administrative ministry/ division: Ministry of Home Affairs

Executing Agency: Fire Service and Civil Defense Directorate and PWD

Location of the Project: 54 different places of Bangladesh .

Implementation Period:

Date of commencement:

Original: July 2008

Latest revise: July 2008

Actual: July 2008

Date of completion

Original: June 2011

Latest revised: June 2012

Actual: June 2012

Time overrun % of original time: 33%

Cost:

Original: 3006.66 Lakh Taka

Latest revise: 3006.66 lakh Taka

Actual expenditure: 3006.66lakh Taka

cost overrun % of original cost: 0%

Project 5:

Name: Construction of NGO Affairs Bureau Office Building

Administrative ministry/ division: NGO Affairs Bureau, Prime Minister's Office.

Executing Agency: Public Works Department (PWD)

Location of the Project: Plot# E-13-B, Agargaon, PS-Kafrul, Dhaka.

Implementation Period:

Date of commencement:

Original: January 2014

Latest revise: January 2014

Actual: November 2014

Date of completion

Original: December 2016

Latest revise: December 2016

Actual: December 2016

Time overrun % of original time: 0%

Cost:

Original: 4737.47 Lakh Taka

Latest revise: 4737.47 Lakh Taka

Actual expenditure: 4048.08 Lakh Taka

cost overrun % of original cost: 0%

Project 6:

Name: Bangabandhu Textile Engineering College at Tangail.

Administrative ministry/ division: Ministry of Jute & Textile

Executing Agency: Public Works Department (PWD)

Location of the Project: kalihati, Tangail

Implementation Period:

Date of commencement:

Original: 03/01/2011

Actual: 03/01/2011

Date of completion:

Original: 30/06/2014

Actual: 30/06/2014

Time overrun % of original time: 0%

Cost:

Original: 2840 lakh Taka

Latest revise: 4976 lakh Taka

Actual expenditure: 4971.72 lakh Taka

Cost overrun % of original cost: 100%

Project 7:

Name: Construction of Dhaka Central Jail at Gazipur .

Administrative ministry/ division: Ministry of Home Affairs

Executing Agency: Directorate of prisons and PWD

Location of the project: Gazipur

Implementation Period:

Date of commencement:

Original: July1995

Latest revise: July1995

Actual: July1995

Date of completion

Original: June 2002

Latest revise: June 2010

Actual: June 2010

Time overrun % of original time: 114%

Cost:

Original: 12941.56 Lakh Taka

Latest revise: 18121.27 lakh Taka

Actual expenditure: 18121.27lakh Taka

cost overrun % of original cost: 40%.

[Causes of revision

1. Price of construction material increased, schedule of rate changed.
2. Physical work of 5 station dropped
3. Inter-component adjustment for successful completion of project]