

## Detail Study of “Project Management Processes & it’s Framework”



### Engineering

KEYWORDS :

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### ABSTRACT

*This paper maps the details study of Project Management Processes i.e. Project Initiating, Planning, Executing, Monitoring, Controlling & Closing. This paper gives the introduction to the key concept in the project management field; it summarizes the processes, inputs & outputs that are considered good practices on most of the projects most of the times. The project management is application of knowledge, skills, tools & techniques to project activities to meet the project requirements. The process is set of interrelated actions & activities performed to achieve a pre-specified product, result, or service. Project management processes are grouped in to five categories known as Project management Process Groups or Process Group.*

*This paper will elaborate on this process Groups by using the live project & will guide the New Construction Managers about how to monitor & track the project with ease.*

*“Everything becomes simple when it reduce to fundamentals” is basis of Project management Processes.*

### 1. INTRODUCTION:

Project management processes apply globally & across industry groups. Good practice means there is general agreement that application of Project Management processes has been shown to enhance the chances of success over a wide range of projects.

The five process groups are as below mentioned:

**1.2 Planning Process Group** – Those Process required to establish the scope of project, define course of action required to attain objectives that project was undertaken to achieve.

**1.3 Executing process Group** – Those processes performed to complete the work defined in Project Management plan to satisfy project specification.

**1.4 Monitoring & Process Group** – Those Process required to track, regulate the processes & performance of the Project, identify any areas in which changes to plan are required.

**1.5 Closing process Group** – Those process performed to finalize all activities across all process groups to formally close the project.

### 2. LITERATURE REVIEW:

**2.1** Deigo Echeverry, Student Member –ASCE, C. Williams Ibbes & Simon Kim – Member, ASCE. -

Title – “Sequencing Knowledge for Construction Scheduling” – Published in J. Constr. Manage. 1991-117(1): 118-130 –

This paper describes knowledge utilized by skilled schedulers for sequencing construction activities.

**2.2** Alan D. Russel, Member, ASCE & William C. M. Wong – “New Generation & Planning Structures” – J. Constr. Manage. 1993, 119(2)–196-214 – This paper describes the development & use of a new generation of planning structures.

**2.3** R. Sacks – Senior Lect. Faculty of Civil Engg. – Technion Israel Institute of Tech., haifa, Israel, M. Goldin – Graduate student of Technion Israel Institute of Tech., haifa, Israel – “Lean Management model for construction of High rise Apartment buildings” – Execution of finishing works

in high rise buildings is made complex by the need of customize apartments to the varying requirements of individual clients.

**2.4** Zhili Gao – Graduate student, Iowa State Univ., Gary R. Smith, Prof. & Director – Constr. Management & Engineering, North Dakota State Univ., Edward Minchin – Asst. Prof. of Civil Engg., Univ. of Florida. - “Budget & Schedule Success for small capital Projects.” – this paper describes an opportunity to improve the organizational performance through more effective project execution.

**2.5** Damien Schatteman - Research Asst. Dept. of decision Science Information management, Leuven, Belgium. Willy Harroelen – Emeritus Prof., Dept. of decision Science Information management, Leuven, Belgium. Methodology for Integrated Risk Management & Proactive Scheduling of Construction Projects- J. Constr. Manage. , 2008 – 134(11): 885-893 – This paper describes the application of methodology on a real life construction project.

### 3. OBJECTIVES OF STUDY:

**3.1** To study the standards of Project Management - this indicates application of appropriate knowledge, processes, skills, tools & techniques.

**3.2** To study project management processes for a Project i.e. Initiating, Planning, Executing, Monitoring, and Controlling & Closing.

**3.3** To prepare project schedule with the help of planning tool Microsoft Project to understand the project management processes by implementing the same on live project.

**3.4** To understand & the need of Safety standards for successful completion of the Project.

### 4. RESEARCH METHODOLOGY:

Methodology selected for this project is based on following common project management processes. In this chapter the management processes are discussed in details & same is used for live project in Pune, Knodhwa, for Konark Karia Builder & management practices used in this particular projects.

The integrated nature of Project Management requires

monitoring & controlling process group to interact with the other Process Groups as shown in following fig. 1. In addition, since management of project is a finite effort, the initiating Process Group begins the Project & the Closing Process Group ends it.

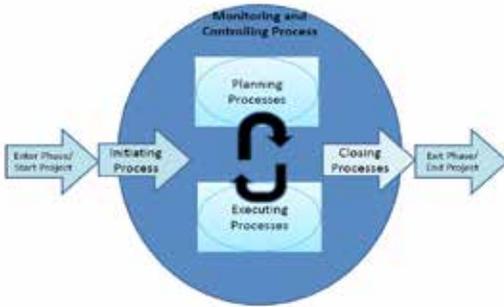


FIG 1-Project Management Process Group

Process groups are seldom either discrete or onetime events; they are overlapping activities that occur throughout the project.

Figure 2 illustrates how Process Groups interact & shows the level of overlap at various times.

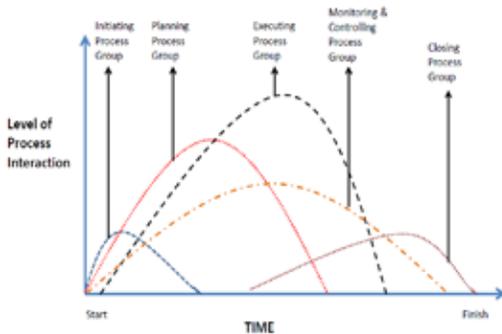


FIG -2 – Process Group Interact in a Phase or Project

**Project management processes group:**

The following sections identify & describe the five Project Management Process Groups required for any project.

**4.1 Initiating Process Group:**

This group consists of those processes performed to define a new project by obtaining authorization to start.

This Group includes the following processes:

**4.1.1 Develop project charter:**

Project charter is process of developing a document that formally authorizes a project & documenting initial requirements.

**4.1.2 Identify Stakeholders:**

Identify stakeholders is a process of identifying all people or organizations impacted by the project.

**4.2 Planning Process Group:**

This group consists of those processes performed to establish the total scope of the effort, define & refine objectives & develop the course of action required.

**Following processes are included:**

4.2.1 Develop project management plan.

4.2.2 Create WBS.

4.2.3 Define Activities.

4.2.4 Sequence Activities.

4.2.5 Develop Schedule with activity duration and resource.

**4.3 Executing Process Group:**

This process group involves coordinating people & resources, as well as integrating & performing activities of project in accordance with project management plan.

Following processes are included in this Group:

4.3.1 Direct & manage Project Execution.

4.3.2 Perform quality assurance.

4.3.3 Develop Project Team.

4.3.4 Manage project team.

4.3.5 Distribute information.

**4.4 Monitoring & Controlling Process Group:**

This process group consists of those processes required to track, review, & regulate the progress & performance of the project, identify any areas in which changes to the plan are required. This process group also includes:

4.4.1 Monitor & control Project work.

4.4.2 Perform integrated change control.

4.4.3 Verify scope.

4.4.4 Control scope.

4.4.5 Control Schedule.

4.4.6 Control Cost.

**4.5 Closing Process Group:**

This group consists of those processes performed to finalize all activities across all project management process groups to formally complete the project. It includes following:

4.5.1 Obtain acceptance by the customer or sponsor.

4.5.2 Conduct post-project or phase-end review.

4.5.3 Record impacts of tailoring to any process.

4.5.4 Document lessons learned.

4.5.5 Close out procurement.

**5. DATA COLLECTION:**

For implementation of above methodology, following project was selected & analysis has been done on same:

Project Name: KonarkKrish II.

Location of the Project: Keshavnagar, Mundhwa, Pune.

Type: Residential Project.

No of Units: 144 No. Units.

Other Amenities- 2 club houses, U/G Parking, swimming pool, STP.



FIG-3 KonarkKrish II

At project the following few points were observed:

1. Project Charter for Project was not prepared by project manager or Project management team.
2. No Project Management Plan was prepared to complete the project.
3. There was no guideline for the junior site engineers at site, for execution, quality and safety.
4. There was no material specifications documented at site.
5. Due to frequent changes in the work by the stakeholders, lot of changes has been done while construction phase.
6. Decision taken at head office was not percolated at site properly, and vice e versa.
7. Responsibility given to each engineer was changing frequently.

**6. DATA ANALYSIS:**

As project was already started& site construction was in progress, the immediate requirement for the project was to prepare the Project Management Plan. The baseline schedule was first prepared& circulated to site engineers. Microsoft Project tool was used to prepare the Baseline Schedule.

ID	Task Name	Duration	Start	Finish	2014	2015	2016
1	KONARK KRISH II PROJECT	756.13 days	Mon 02-02-15	Sat 28-01-17			
2	Building A	500 days	Thu 23-07-15	Sun 04-12-16			
3	Substructure Work	43 days	Thu 23-07-15	Fri 04-08-15			
24	Superstructural Works	248 days	Fri 04-08-15	Thu 18-08-16			
175	Finishing Works	417 days	Wed 14-10-15	Sun 04-12-16			
43	Building B	500 days	Thu 23-07-15	Sun 04-12-16			
42	Substructure Work	43 days	Thu 23-07-15	Fri 04-08-15			
44	Structural Works	219 days	Fri 04-08-15	Tue 15-07-16			
50	Finishing Works	417 days	Wed 14-10-15	Sun 04-12-16			
128	Development Work	756.13 days	Mon 02-02-15	Sat 28-01-17			
128	Parking Structure	248 days	Thu 01-10-15	Sun 05-08-16			
129	UGWT	34 days	Sat 01-10-15	Fri 04-10-15			
130	Pump Room	64 days	Mon 02-11-15	Tue 05-01-16			
171	Swimming Pool	194 days	Sat 19-12-15	Mon 11-04-16			
183	STP	84 days	Fri 01-01-16	Wed 24-02-16			
188	Club house - 1	167.13 days	Mon 02-02-15	Wed 04-05-16			
189	Club house - 2	167.13 days	Mon 02-02-15	Wed 04-05-16			
225	Misc Work	356.13 days	Wed 04-02-15	Sat 28-01-17			

FIG - 4 – Level 3 Baseline project Management Plan.

Schedule was updated against baseline schedule& progress was shown in terms of percentage completion.

Following figure shows the updated baseline schedule against the actual dates of the activities carried out.

ID	Task Name	% Complete	Baseline Start	Baseline Finish	Actual Start	Actual Finish	Jan	Apr	Jul	Oct
1	KONARK KRISH II PROJECT	75%	Mon 02-02-15	Sat 28-01-17	Sat 01-08-15	NA				
2	Building A	81%	Thu 23-07-15	Sun 04-12-16	Sat 01-08-15	NA				
3	Substructure Work	100%	Thu 23-07-15	Fri 04-08-15	Sat 01-08-15	Wed 18-05-15				
24	Superstructural Works	100%	Fri 04-08-15	Thu 18-08-16	Thu 18-08-16	Sun 05-08-16				
175	Finishing Works	78%	Wed 14-10-15	Sun 04-12-16	Thu 28-08-15	NA				
43	Building B	78%	Thu 23-07-15	Sun 04-12-16	Sat 01-08-15	NA				
42	Substructure Work	100%	Thu 23-07-15	Fri 04-08-15	Sat 01-08-15	Wed 18-05-15				
44	Structural Works	100%	Fri 04-08-15	Tue 15-07-16	Thu 18-08-16	Sun 05-08-16				
50	Finishing Works	71%	Wed 14-10-15	Sun 04-12-16	Thu 05-05-16	NA				
128	Development Work	81%	Mon 02-02-15	Sat 28-01-17	Thu 05-05-16	NA				
128	Parking Structure	100%	Thu 01-10-15	Sun 05-08-16	Thu 05-05-16	Sat 07-01-17				
129	UGWT	100%	Sat 01-10-15	Fri 04-10-15	Fri 20-05-16	Wed 22-05-16				
130	Pump Room	100%	Mon 02-11-15	Tue 05-01-16	Thu 05-05-16	Thu 07-07-16				
171	Swimming Pool	100%	Sat 19-12-15	Mon 11-04-16	Tue 27-05-16	Wed 12-10-16				
183	STP	100%	Fri 01-01-16	Wed 24-02-16	Thu 05-05-16	Mon 27-05-16				
188	Club house - 1	100%	Mon 02-02-15	Wed 04-05-16	Thu 05-05-16	Fri 04-11-16				
189	Club house - 2	100%	Mon 02-02-15	Wed 04-05-16	Thu 05-05-16	Fri 04-11-16				
225	Misc Work	17%	Wed 04-02-15	Sat 28-01-17	Sat 04-06-15	NA				

FIG - 4 – Level 3 Updated Baseline project Management Plan.

**7. PRACTICAL PROBLEMS FACED:**

There were lots of problems faced during preparation of Project Management plan. Few were listed below:

- 7.1 Few of the senior engineers were not co-operating to new ideas management wanted to implement.
- 7.2 It has been observed that no rate analysis has been done while awarding the contract to some of the contractors.
- 7.3 Some of contracts were terminated during the execution phase due to contractual issues by Builder.
- 7.4 Due to all above reasons, schedule has been revised.

7.5 Safety standards are not followed to the satisfactory level.

**8. RESULTS:**

There was considerable amount of changes happened in terms of Quality of work & Amount of time saved during execution of works.

8.1 Due to Project Management Plan, it became very easy for site engineers to understand the volume of work & time required to complete the milestones.

8.2 As rate analysis has been done for some of the costlier items on the request by the management, it has been observed that lots of contracts were awarded wrongly. i.e. for electrical contractor We have done lot of market research, rate analysis and found the rate given to current contractor was much more.

Same has happened with one of the RCC, Plumbing & tiling contractor.

Table 1 shows summary of rate analysis shown for Electrical Work.

KrishII - Top Sheet						
Sr. no	Desc.	No. of Flats	Contractor		as per Market	
			Rate	Amount	Rate	Amount
1	1 BHK	48	41000	1968000	38000	1824000
2	2 BHK	72	50500	3636000	48500	3492000
3	2.5 BHK	12	56000	672000	53000	636000
4	3 BHK	12	62000	744000	59200	710400
5	Meter Room	3	55000	165000	51670	155010
6	Material Supply	1	55200	55200	55200	55200

It has been seen from the above table that appr. 36,00,000.00Rs. Saved from the termination of current electrical contractor.

8.3 Same analysis done for various suppliers & contractor to save on cost, i.e. Lift Vendor, Tiling Contractor, Plumbing Contractor, STP, Painting Contractor etc.

8.4 By using Baseline Schedule, problem of material shortage has been reduced, because engineers now able to tell their requirement well in advance.

## 9. CONCLUSION:

9.1 Project management processes ensure effective flow of the project throughout its existence.

9.2 Project managers should carefully address each process & its constituent's inputs & outputs.

9.3 Project management is an integrative undertaking requiring each project & product process to be appropriately aligned & conducted with the other process to facilitate coordination.

9.4 It has been observed at KonarkKrish II, that with Project management Approach we can save lot on project time & cost.

9.5 Proper safety can ensure a great deal of time & cost saving for project.

## 10. REFERENCES:

- 1 DeigoEcheverry, Student Member –ASCE, C. Williams Ibbs& Simon Kim – Member, ASCE., "Sequencing Knowledge for Construction Scheduling" – J. Constr. Manage. 1991-117(1): 118-130
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- 3 R. Sacks – Senior Lect. Faculty of Civil Engg. –Technion Israel Institute of Tech., haifa, Israel, M. Goldin – Graduate student of Technion Israel Institute of Tech., haifa, Israel – " Lean Management model for construction of High rise Apartment buildings"
- 4 ZhiliGao – Graduate student, Iowa State Univ., Gary R. Smith, Prof. & Director – Costr. Management & Engineering , North Dakota State Univ., Edward Minchin – Asst. Prof. of Civil Engg., Univ. of Florida. - "Budget & Schedule Success for small capital- Facility Projects."
- 5 E. Damien Schatteman - Research Asst. Dept. of decision Science Information management, Leuven, Belgium. Willy Harroelen – Emeritus Prof., Dept. of decision Science Information management, Leuven, Belgium. Methodology for Integrated Risk Management & Proactive Scheduling of Construction Projects.