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Project Progress Evaluation:

Methodology and Reporting Template

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Abstract

A way to achieve projects' timely completion is by ensuring effective monitoring of the execution progress. However, a recent survey shows that poor project progress reporting systems are common in practice. Thus monitoring to achieve timely delivery appears not effective. This gap is addressed here to ensure timely completion and effective cost control.

This work provides a methodology for project progress evaluation that is time-cost based. Project planning tools including work breakdown structure and networking were used to develop period and cost schedules and distribution graphs. These would provide the benchmark for assessing the status reports as the project progresses.

The approach was used to develop the benchmark for a given set of activities and this provides a basis for comparing the project's progress and variations.

This work thus provides an analytical approach for project progress evaluation based on the activities, time and cost. This approach is also comprehensive and would ensure timely completion of projects.

Keywords: Project; Progress; Methodology; Evaluation.

Introduction

A project goal is a strong statement a lofty and inspiring vision for the future. It is usually a short and rather broad statement of a positive change in status. On the other hand, a project objective or project purpose states the direct impact the project is expected to have. One single objective unifies a project. While projects usually have a number of component parts, a unified objective states the combined results of all parts taken together.

[+]Dedication: This work is dedicated to our former colleague and friend, the late Engr. Pat. Nnweremizu (Ph.D. in view), who left us not too long ago.

Components are the parts of the project which tell how to reach the stated objectives. They are also sometimes referred to as outputs and are the goods and services the project will produce or provide. The components taken together are typically independent but still integrated. Some components may overlay in timing yet others may have to be done in sequence. How to effectively and efficiently execute these, still pose challenges to both practitioners and clients.

Activities, also called inputs are the tasks carried out to accomplish each component (output). A component is usually broken into a series of activities necessary for its completion. Such activities are presented in the sequence in which they will be performed in the project, and the critical path indicated.

By properly executing all activities, each of the components is achieved, and by completing the components as planned, the objectives are reached. Furthermore, if the objectives are attained, a major contribution towards the goal is made. The above logic is depicted in fig. 1 as the hierarchy of project goal achievement (Olorunnisola, 2007).

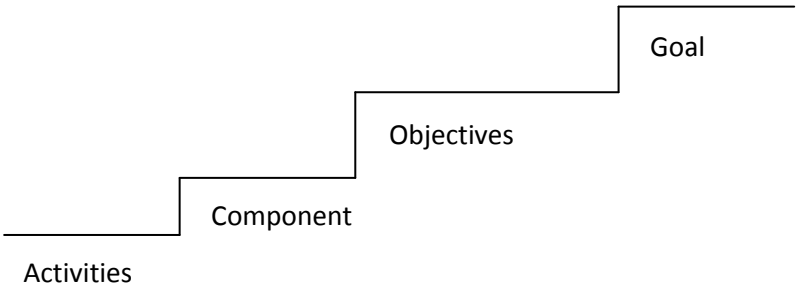


Fig. 1: The hierarchy of project goal achievement

A recent survey of some project monitoring and execution procedures shows that poor project progress reporting system are employed. For an example, most of them are qualitative and descriptive concepts and methods. Anyaeche (2009), reports that poor project progress reports, mostly descriptive and without adequate analytical content, are common in practice.

In this work we would provide a methodology for project progress report to complement the qualitative approach.

Objectives

The objectives of this work are

(1) To develop a methodology for evaluating and reporting Project Progress.

(2) Use the methodology developed to carry out a progress evaluation of a project, given the activities and their precedence relationships.

Literature Review

Some of the previous work in this area include Kulkani and Adlakha (1986), Newell (2002), Newell (2002), e.t.c. Kulkani and Adlakha (1986) studied the Regenerative Pert Network. The authors used markov regenerative pert network to investigate the project progress. Newell

(2002), assessed the preparation of the Project Management report. Also, Newell (2002),, which developed an Algorithm for Project Tasks Selection Using the Intent Tree Structure, with a view to monitoring project progress.

Progress reports have several important functions, which include the following: They

- Reassure recipients that the project is making progress, that the project is going smoothly, and that it will be completed by the expected date.
- Provide their recipients with a brief look at some of the findings or some of the work of the project.
- Give their recipients a chance to evaluate the work on the project and to request changes.
- Provide opportunity for the stake holders to discuss problems in the project and thus to forewarn recipients.
- Force the stake holders to establish a work schedule so that the project is completed on time.

An overview of the contents of the progress report, gives the details of project's purpose, the scope, and activities. These aid the recipients who are unfamiliar with the project, do not remember certain details, or want to check the approach adopted to the project (Badiru, 1988; Kerzner, 2003; Lester, 2003; Babcock and Morse 2005).

Depending on the size of the progress report, the length and importance of the project, and the recipient, the progress report can take the following forms:

- Memo—A short, informal report
- Letter—A short, informal or formal report
- Formal report—A long, formal report

Below are some of the several project planning and scheduling tools available in the literature (Hiller et. al., 2006, Taha, 2007, Anyaeche, 2009).

(1) Statement of work (SOW)
(2) The milestone schedule
(3) The work breakdown structure (WBS)
(4) Gantt (bar) chart
(5) Network scheduling system such as PERT or CPM other project n/w models
(6) Resource allocation methods.

This work would develop a template for project progress and monitoring.

Development of a Progress Report Template

The information for project progress report can be shown with either time periods or project tasks or a combination of both time periods and project tasks (Lester, 1991; Payne et. al

1996).

A time period project progress report usually summarizes work within each of the following:

- Work accomplished in the preceding period(s)
- Work currently being performed
- Work planned for the next period(s)

In Project tasks reports, practically every project activity is broken down into individual tasks, using work break down structure concept.

Although a progress report may include the Introduction, Project description, Benchmark report, Status report, and conclusion, the focus of this work is mainly on the analytical aspects of benchmarking and status report.

2.1. Benchmark Computations

To evaluate the progress of a project, the benchmark has to be in place. The format for this would use the Gantt chart, Resource (cost) schedule and resource (cost) distribution.

A progress report usually summarizes work within each of the following:

- Work accomplished in the preceding period(s)
- Work currently being performed
- Work planned for the next period(s)
- Any unforeseen development.

From the given data, the following are carried out:

- Establish a network diagram
- Determine the critical path
- Determine the cost schedule for each of given time periods.
- Determine the cost distribution graph for each of given time periods.

2.2 Status Chart

While the benchmark gives the expectation of the client, the project or site officer should use the heads in the benchmark and produce a status report. In addition to that he should also provide the percentage completion/compliance and variation.

2.3. Concluding Part. The author of a project progress report should provide an overall appraisal of the project to date, which usually acts as the conclusion. The final paragraph or section usually reassures the stakeholders that all is going well and on schedule. It can also alert recipients to unexpected changes or problems in the project.

To demonstrate the analytical part of a progress report we give an example problem (Nnweremizu, 2006) to give the utility of the developed technique.

3.0 EXAMPLE PROBLEM

3.1 Project Data:

Consider a project with data showing activities, costs in Naira (₦) and the corresponding activities in weeks (wk).

Table 1: Data for A Project

S/No	Activity	Cost (₦)	Duration (wks)
1	A	7,500	2
2	B	2,000	13
3	C	12,000	6
4	D	45,000	10
5	E	6,000	6
6	F	8,000	4
7	G	13,000	9

S/No	Activity	Cost(₦)	Duration (wks)
8	H	4,000	2
9	I	28,000	7
10	J	64,000	6
11	K	9,000	6
12	L	6,000	4
13	M	36,000	10

With the data given in Table 1, we shall attempt to develop a project progress report for every five weeks, assuming that the progress would be assessed every five weeks. It the schedule is different then, the relevant schedule applies.

3.2 Application: Here we give an analytic aspect of project progress report, which gives a good perception of the progress made in the project execution. The first part of this is the drawing of the network diagram and the determination of the critical path, and subsequently, developing a project monitoring benchmark for the project.

3.3 Network diagram

The network for the project with data set as in Table 1 is as shown in Fig. 2. This is drawn using one of the tools highlighted in section 1.3.ie. PERT. is used for this.

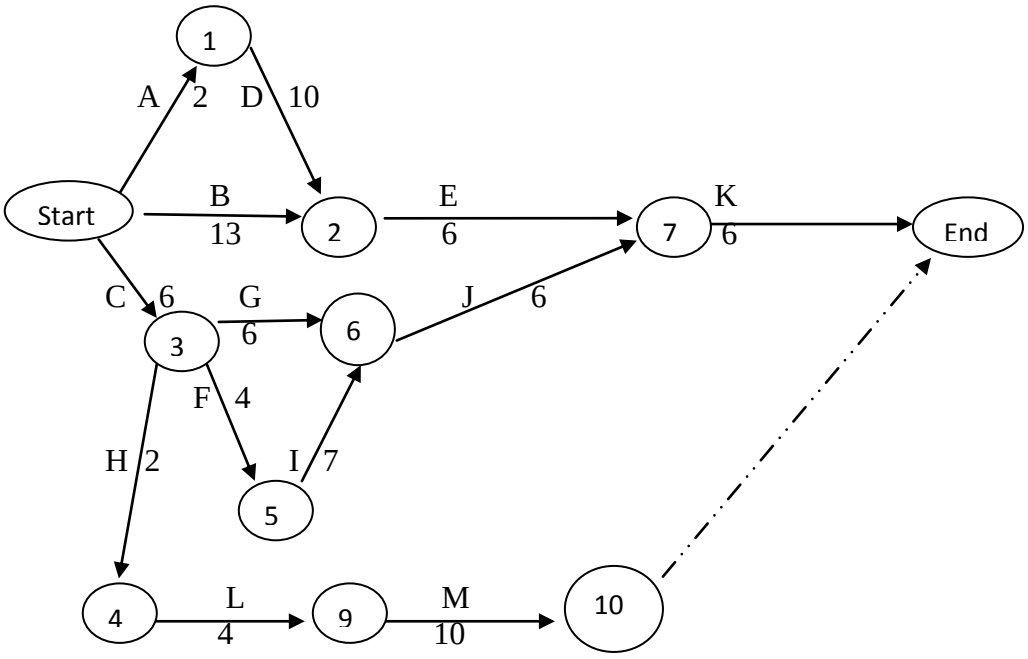


Fig. 2: Network diagram

4.0 RESULTS AND DISCUSSION

4.1 Computation of Results

To develop the inspection schedule we use the given data to develop a bench mark. This serves as the reference for assessing the performance at any of the scheduled inspections. A status report is prepared along the same outline of the benchmark and a comparism made to determine the level of achievement, the discrepancies and variations.

The following are computed: For the bench mark, we compute the following:

- Calculate the cost slope
- Determine the cost schedule for each five weeks
- Draw the bar chart schedule, and
- Construct the cost distribution graph

Table 2a : Cost Schedule and percent completion of the project activities

Period	Activity	Cost	Duration	Cost Slope	Activity Time (weeks)	Total Activity expenditure	Completion		
							% age	Cumm	Activity
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0 to 5	A	7500.00	2	3750.00	2	7500.00	100.00	100.00	A
	B	2000.00	13	153.85	5	769.23	38.46	38.46	
	C	12000.00	6	2000.00	5	10000.00	83.33	83.33	
	D	45000.00	10	4500.00	3	13500.00	30.00	30.00	
	Total 0 to 5					31769.23	100.00		
6 to 10	B	2000	13	153.85	5	769.23	38.46	76.92	
	C	12000	6	2000.00	1	2000.00	16.67	100.00	C
	D	45,000	10	4500.00	5	22500.00	50.00	80.00	
	F	8,000	4	2000.00	4	8000.00	100.00	100.00	D
	G	13,000	9	1444.44	4	5777.78	44.44	44.44	
	H	4,000	2	2000.00	2	4000.00	100.00	100.00	H
	L	6,000	4	1500.00	2	3000.00	50.00	50.00	
	Total 6 to 10					46047.01	100.00		
11 to 15	B	2000	13	153.85	3	461.54	23.08	100.00	B
	D	45,000	10	4500.00	2	9000.00	20.00	100.00	D
	E	6,000	6	1000.00	2	2000.00	33.33	33.33	
	G	13,000	9	1444.44	5	7222.22	55.56	100.00	G
	I	28,000	7	4000.00	5	20000.00	71.43	71.43	
	L	6,000	4	1500.00	2	3000.00	50.00	100.00	L
	M	36,000	10	3600.00	3	10800.00	30.00	30.00	
	11 to 15					52483.76	100.00		

The results of cost slope and the cost schedule for every five weeks are given in Table 2. Table 2 also gives the total expenditure for the scheduled periods as well as the expected completion, not just for the individual activities, but also for the activities expected to be completed in any of the periods.

Table 2b : Cost Schedule contd

Period	Activity	Cost	Duration	Cost Slope	Activity Time (weeks)	Total Activity expenditure	Completion		
							% age	Cumm	Activity
16 to 20	E	6,000	6	1000.00	4	4000.00	66.67	100.00	E
	I	28,000	7	4000.00	2	8000.00	28.57	100.00	I
	J	64,000	6	10666.67	3	32000.00	50.00	50.00	
	M	36,000	10	3600.00	5	18000.00	50.00	80.00	
	16 to 20					62000.00	100.00		
21 to 25	J	64,000	6	10666.67	3	32000.00	50.00	100.00	L
	K	9,000	6	1500.00	2	3000.00	33.33	33.33	
	M	36,000	10	3600.00	2	7200.00	20.00	100.00	M
	21 to 25					42200.00	100.00		
26 to 30	K	9,000	6	1500.00	4	6000.00	66.67	100.00	K
	26 to 29					6000.00	100.00		

From the Table 2, the client or the officer monitoring the progress of the project cana t a glance is the following :

4.2 Cost bar chat

Next we draw the Gantt chat for the cost of the activities. This is presented in fig.3. Fig.3 also shows how much each activity would cost and the possible overlap in time of the activities.

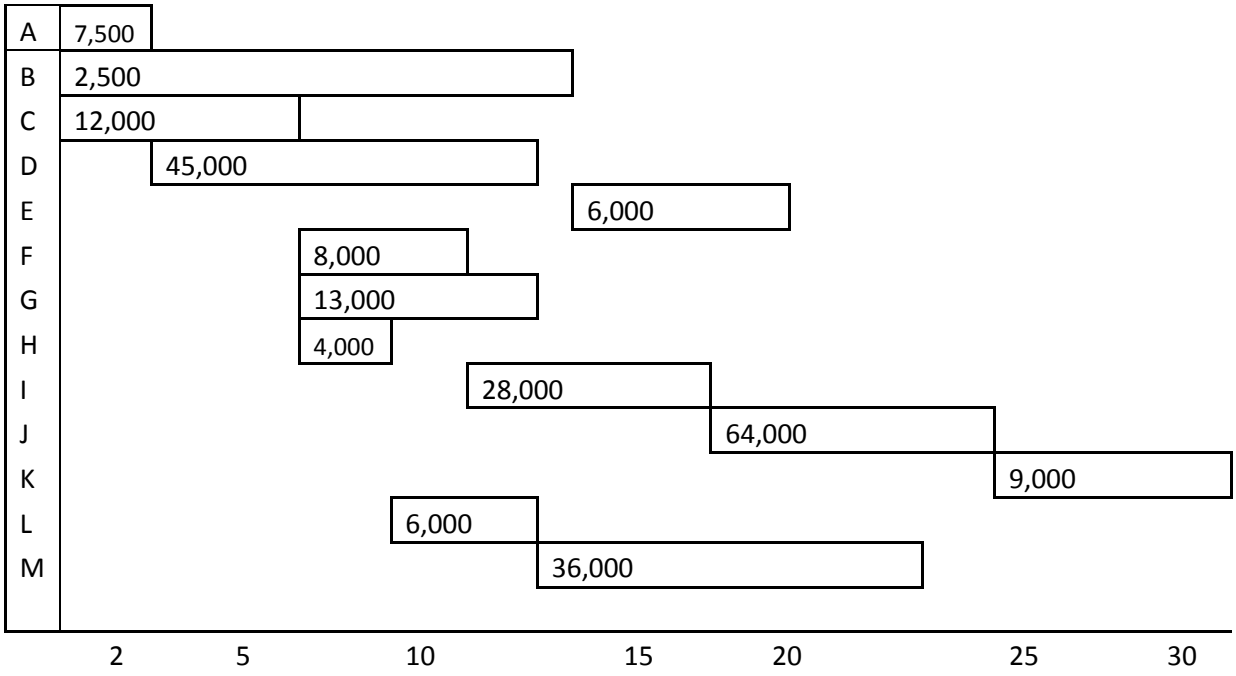
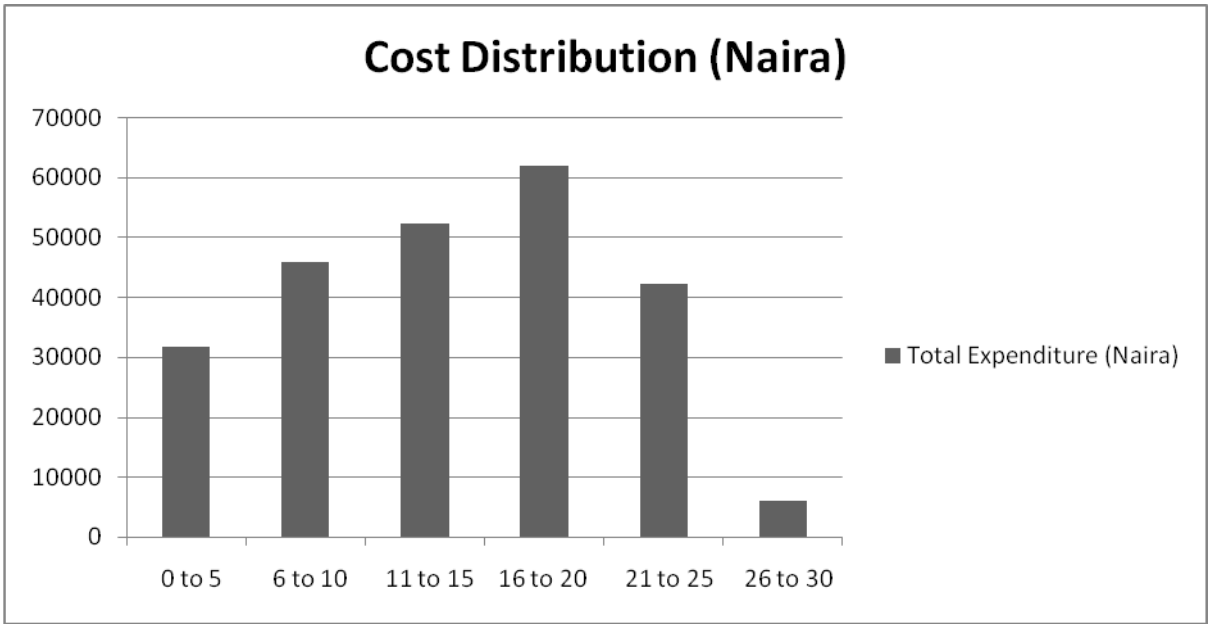


Fig. 3: Cost bar chart

4.3 Cost Distribution Graph

The cost distribution graph is presented next. Observe that this shows how much is required for each of the scheduled periods. The graph is given in fig 4.



Period in weeks

Fig. 4: Cost distribution graph

Essentially the site officer writing the report should highlight the variations and the percentage completion of the different tasks and a summary for the time period specified.

(b) The Status Report
A status report is then developed, for the corresponding cost schedule, bar chart and cost distribution graph. A comparism is then made to establish the variations and how the target completion and progress are made.

4.4 Algorithm for Project progress report

From the given data, do the following:

a. Establish a network diagram
b. Determine the critical path
c. Determine the cost schedule for each of the given time periods.
d. Establish the cost distribution graph for each of given time periods.
e. Establish the cost bar chart.
f. Establish a benchmark for executing the activities based on the critical part and cost distribution graph.
g. Establish a status report
h. Compare (f) and (g).
i. Make necessary recommendations.

5.0 CONCLUSIONS

In this work we presented the different techniques used in project monitoring and evaluation and succinctly combined them to produce a project progress evaluation template that can be used to monitor project progress.

The project progress evaluation needs developing both a benchmark report and a status report. A case example was used to demonstrate the utility of the approach.

In this work we demonstrated and developed project monitoring template. This template could be applied to any project be it in construction, service or manufacturing. The key feature is that the activities to achieve the set goal(s) of the outcome(s) are identified or developed.
Finally, the techniques were subsequently used to demonstrate the progress evaluation process.

6.0 RECOMMENDATIONS FOR FURTHER WORK

The activities considered here are the individual tasks. A further evaluation can be carried out for given sets of activities that can be carried out concurrently, instead of specifying say activity ‘A’, ‘A’ can be a set of activities that can be simultaneously executed as a group, thus providing a leverage for resource leveling savings. A generic computer program can be developed to make the procedure easier and more user friendly. These call for further work especially when the activities involved are many.

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