A Some of Paddy Cleaning Machine on Activity Free Float in Activity- on –Arrow and Node Networks: Part II

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Abstract: This research presents important guidelines for implementing the implementation process. Advantages and disadvantages of the project implementation. Considering the project as a network, we use CPM techniques to try to find the critical path of the network, and suggest the best way to supply and manufacture certain machines. Under these constraints, critical paths that include certain project activities. Means the longest path (Depending on the duration) of the project and any delays that will occur on this path will lead to delays in the project. Therefore, critical path analysis is done using the PERT / CPM module. In the project schedule, the total floats and free floats of activity show agility in scheduling. Activity time without affecting subsequent activities.

1 INTRODUCTION

1.1 Total Float

Total float is what many of us are aware of, and is commonly referred to as a float. Total float is the amount of time an activity can be delayed without delaying the project completion date. On a critical path, the total float is zero. Total float is often known as the slack. (https://pmstudycircle.com)

This research can calculate the total float by subtracting the Early Start date of an activity from its Late Start date (Late Start date – Early Start date), or Early Finish date from its Late Finish date (Late Finish date – Early Finish date).
(https://pmstudycircle.com)

1.2 Free Float

Now we come to free float. This is going to be a bit different and might be new to you. Free float is the amount of time an activity can be delayed without delaying the Early Start of its successor activity.

We can calculate the free float by subtracting the Early Finish date of the activity from the Early Start date of next activity (ES of next Activity – EF of current Activity).

Keep in mind that if two activities are converging to a single activity, only one of these two activities may have free float.
(https://pmstudycircle.com)

The Figure 1 below shown activity of network analysis.

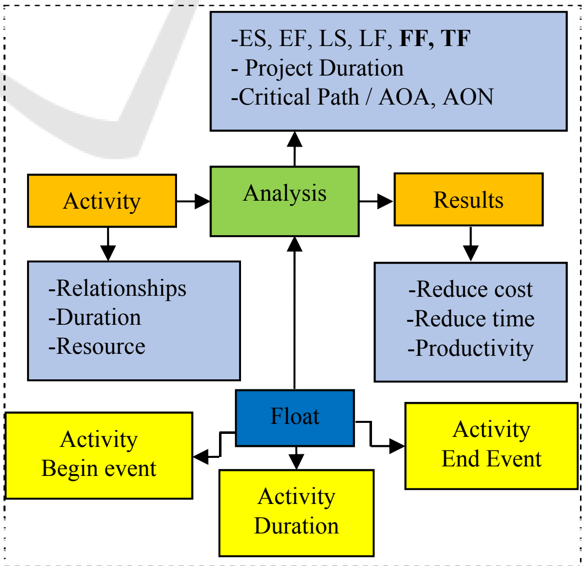

Figure 1: Network analysis.

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1.3 Part I Research

Part I research has been conducted in the field of planning, management and project control. The project is a rice paddy cleaner of the project using a network of activities (S. Bangphan, 2018).

This research has been funded by the University for the Organic Business of 7 types of Organic Brown Rice. The Network Analysis (CPM / PERT) has been conducted and has provided the following answers:

• What are the important activities or tasks in the project that could delay all projects if they are not completed on time?

• Does the project meet deadlines or do not exceed deadlines?

• If the project has to be completed earlier than planned, what is the best way to do this in the least possible way? (S. Bangphan, 2018)

• Table 1 shows the work breakdown structure and Table 2 shows the details of the paddy cleaner.

Table 1: Work breakdown structure (W.B.S.) of paddy cleaning machine.

Activity code	Activity description
A	Frame
B	Install wheel base with wheel flange
C	Install bearing sets and shaft
D	Install shaft combine with bearing and pulleys
E	Assembly kit one
F	Hopper
G	Control hopper sets
H	Shaft support sets
I	Flow controller
J	Assembly kit two
K	Sieve cleaning sets
L	Made shaft of sieve cleaning
M	Crankshaft
N	Belts
O	pulleys
P	Assembly kit three
Q	Top plate
R	Down plate
S	Adjust of belts
T	Assembly kit four
U	all assembly kit and adjust

Table 2: Description of activities paddy cleaning machine (S. Bangphan, 2018).

Act code	Activity description	Immediate predecessor	Estimated duration (Day)	Normal cost (Dollar)
A	Frame	-	5	115
B	Install wheel base with wheel flange	A	3	55
C	Install bearing sets and shaft	A	2	125
D	Install shaft combine with bearing and pulleys	A	2	135
E	Assembly kit one	B,C,D	3	120
F	Hopper	E	3	85
G	Control hopper sets	E	2	65
H	Shaft support sets	E	3	35
I	Flow controller	E	2	30
J	Assembly kit two	F,G,H,I	4	85
K	Sieve cleaning sets	J	2	140
L	Made shaft of sieve cleaning	J	3	110
M	Crankshaft	J	3	80
N	Belts	J	2	100
O	pulleys	J	2	120
P	Assembly kit three	K,L,M,N,O	3	135
Q	Top plate	P	1	120
R	Down plate	P	1	120
S	Adjust of belts	P	2	135
T	Assembly kit four	Q,R,S	4	100
U	all assembly kit and adjust	T	5	110

2 MATERIALS AND METHOD

Consider the activity of the project using the replacement of the AOA network, as shown in Figure 2. This is how the PERT / CPM identifies the critical path. Each activity with a zero slack center is on an critical path through the project network, such that delays along this path will cause the project to delay. Thus, the critical path is (S. Bangphan, 2018)

The starting and finishing times of each activity without delay occurring anywhere in the project are called the **earliest start time** and the **earliest finish time** of activity. This time there are symbols (Scaat, 2009), (Surapong, 2013).

ES = earliest start time for a particular activity,
EF = earliest finish time for a particular activity,
D = (estimated) duration of the activity

Where

$$EF = ES + D \quad (1)$$

The **latest finish time** has the corresponding definition with respect to finishing the activity. In symbols,
LS = latest start time for a particular activity,
LF = latest finish time for a particular activity,
Where

$$LS = LF - D \quad (2)$$

The **slack or total float** for an activity is the difference between its latest finish time and its earliest finish time. In symbols,

$$Slack = LF – EF \quad (3)$$

(Since LF - EF = LS - ES, either difference actually can be used to calculate slack.)

A→B→E→F→J→L→M→P→S→T→U
= 5→3→3→3→4→3→3→2→4→5 = 31 days

Project network has an important path and no plan in the duplicate diagram. The corresponding AOA and AON network displays are shown in Figures 2 and 3. The free and floating totals for some activities are summarized in Table 3.

2.1 Float Calculations

In the Arrow activity network, the computer calculates the data for both events at the end of the arrow and the activity itself (arrows). As a result, a variety of data sets are available to determine:

Free Float: This means all floats that can handle the activity without affecting the float of the activity. It can be calculated by subtracting the discount of the main activity from the total float of the activity.

$$FF_{ij} = TF_{ij} – (\text{slack of event } j) \quad (4)$$

The float is the maximum time that this activity can cause a delay in completion before an activity becomes an important activity, that is, the delay of the project.

Free float indicates the value at which the problem activity can be delayed beyond the beginning, without affecting the fastest start.

2.2 Part II Research

Second Research, It is a study of floating time sums. And free floating time. The research is part one. Is a critical path.

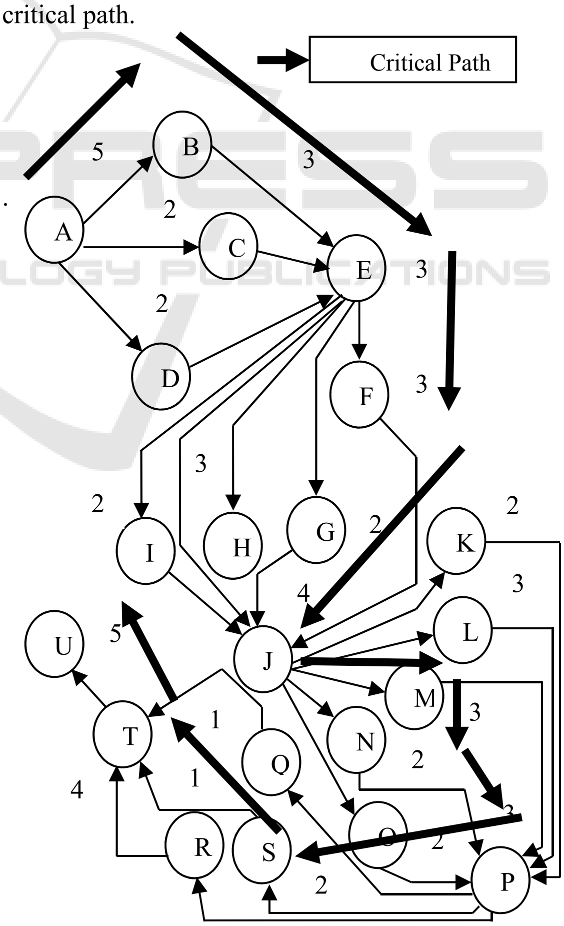

Figure 2: Network diagram for activities paddy cleaning machine (S. Bangphan, 2018).

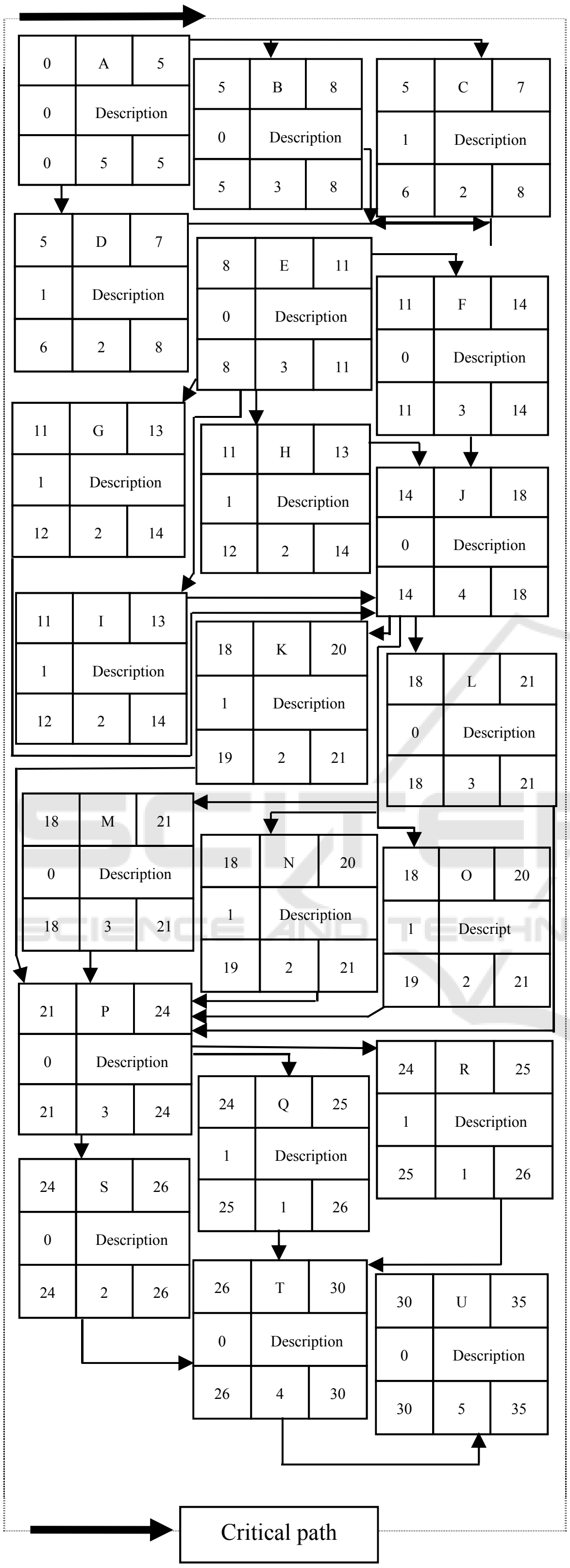

Figure 3: Diagram Node for constructs of paddy cleaning machine (S. Bangphan, 2018).

3 IMPLEMENTATION AND RESULTS

Consider sample projects with AOA networks. Shown in Figure 2. The project network has an important path and no plans in the duplicate diagram. The corresponding AON network representation is shown in Figure 2. The use of (3), (4) free float for some activities summarizes the final column in Table 3.

Table 3: Summary of free floats for some activities of the activity network of project (S. Bangphan, 2018).

Act	Predecessor s	Duration	ES	EF	LS	LF	SL	FF
A	0	5	0	5	0	5	0	0
B	A	3	5	8	5	8	0	0
C	A	2	5	7	6	8	1	1
D	A	2	5	7	6	8	1	1
E	B,C,D	3	8	11	8	11	0	0
F	E	3	11	14	11	14	0	0
G	E	2	11	13	12	14	1	1
H	E	2	11	13	12	14	1	1
I	E	2	11	13	12	14	1	1
J	F,G,H,I	4	14	18	14	18	0	0
K	J	2	18	20	19	21	1	1
L	J	3	18	21	18	21	0	0
M	J	3	18	21	18	21	0	0
N	J	2	18	20	19	21	1	1
O	J	2	18	20	19	21	1	1
P	K,L,M,N,O	3	21	24	21	24	0	0
Q	P	1	24	25	25	26	1	1
R	P	1	24	25	25	26	1	0
S	p	2	24	26	24	26	0	0
T	Q,R,S	4	26	30	26	30	0	0
U	T	5	30	35	30	35	0	0

Explanation: Consider activity B. The slack of head event 5 is 8 – 8 = 0. Therefore, free float = 0 – 0 = 0. Likewise slack of tail event A is 0 – 0 = 0. Therefore independent float = 0.

Critical Path: ABEFJLMPSTU

5333433245= 31 days.

The data analysis in Table 3 can be seen as the date of completion of the activity *U*. The last activity of the project should be 35 days, which is equal to the time it takes to complete the project.

3.1 Calculated Project Float

Team research requires a 44-day end date. Project Float is the total length of time a project can be delayed without delaying the project.

44 days – 35 days = 9 days.

The float may be deleted on a date determined by the research team prior to the time specified in the project schedule. Crashed projects need to be removed or tracked quickly. Crashing is a technique used to shorten the duration of a project by assigning additional resources to the task and reducing the time required for those tasks and details of the components for the construction paddy cleaning.

4 CONCLUSIONS

This research presents a free float for AOA and AON diagrams that assign activity to a specific column in a network diagram, a schedule under a dependency structure, by examining a selected group or activity for each change.

May result or improve all the time estimated by the PERT / CPM method to summarize the paddy machine production project for 44 days. After accelerating all the activities that constitute the critical path, the total project completion time will be 35 days.

The results show that PERT / CPM techniques can lead to improved time and cost of paddy mill production projects and application to other industry and university projects. Increasing number of projects implemented and leading to increased competitiveness.

The float of the project shows a decrease in construction time of 9 days, because it can easily handle data exchange and sequence planning.

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