

UTILIZATION OF NETWORK DIAGRAM IN PLANNING CONTROL IN NIGERIA'S CONSTRUCTION INDUSTRY

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ABSTRACT

To Plan, Screen, and control all the part of some random venture, there is need for inspiration of every one of those required to arrange any given exercises, in order to have the option to accomplish the task inside concurred standards of time, cost and execution. Network graph as one of the strategy for project arranging is being used in the development ventures, however the utilization is as yet restricted in that individuals has barely any familiarity with the benefit it has over different kinds of technique been utilized. Network graph has a legitimate and viable approach to showing entomb connection between every one of the exercises beginning to end of a task, it is of enormous advantages to ascertain the venture generally span. It serves to outwardly screen project status and detail portrayal to character basic exercises not at all like different techniques, which can lessen personality risk as far as time postponed for project exercises.

Keywords: Project, Project Planning, Project Management, Network Diagram, Intention, P.D.M, Gert, Network Analysis (Network Analysis) Critical Part Analysis (C.P.A), Critical Path Method (C.P.M).

I. INTRODUCTION

A project is a set of tasks which must be completed in order to arrive at a particular goal or outcome. Depending on the size and scope of the project, these tasks may be simple or elaborate, but all projects can be broken down into objectives and what needs to be done to achieve them. (Quincy Yarbrough, 2021).

A **project** is any undertaking, carried out individually or collaboratively and possibly involving research or design, that is carefully planned (usually by a project team but sometimes by a project manager or by a project planner) to achieve a particular aim. (Wikipedia, 2021)

What is a Network Diagram in Project Management?

As a venture chief you are liable to such countless obligations to accomplish the ideal result of the undertaking, to provide your group with a superior comprehension of what the task is? Also, what their obligations involve, an organization chart is intended to imagine everyday exercises. The organization chart is portrayed in the wake of delineating the undertakings and obligations, timetables, checking and controlling to follow the endeavors which are being made, it contains Boxes addressing errands and bolts addressing arrangement, giving out a precious stone image of right assignments and obligations in perfect opportunity at an ideal spot.

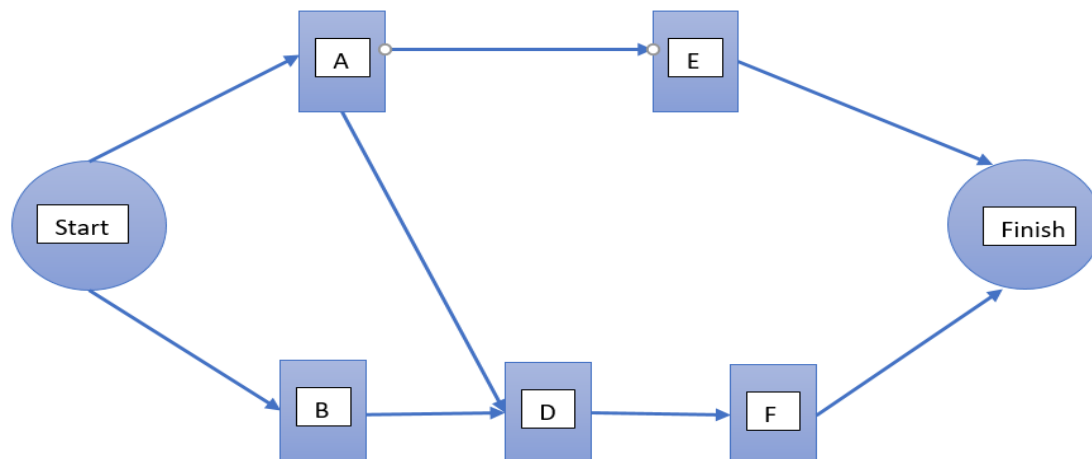


Figure 1: Showing an Activities on the node for a network diagram. (Author's Field Work)

Network chart helps project administrators to picture what is happening, breaking down the circumstance, assessing assets (time, cash, data and individuals) and afterward circulating significant positions into bunches of errands which are being allocated to workers. (Martin Luenendonk, 2022)

The intricacy and straightforwardness of an organization chart relies upon the actual undertaking, it changes as indicated by the circumstance and significance of end target, time and cash. **2.1 Types of Project Network Diagrams**

The Arrow Diagram Method (ADM)

This outline technique is utilized to arrangement the assignments and obligations, the more extended the length of a bolt the more complicated and tedious the errand is, the more modest the bolt the more straightforward the undertaking is. The tail of the bolt shows the beginning or starting mark of the undertaking frequently addressed by "I-hub", in the interim the top of a bolt shows the closure point or the following assignment to be done to accomplish project objectives, the consummation point or the top of the bolt additionally addressed by "j-hub".

Pros:

- Visual picture of the project for all the stakeholders that participate in the business in any way.
- It lays out the steps and required tasks necessary in a project and the order they need to be executed.
- It shows complete time frame important deadlines and reporting dates of each step.
- It helps in tracking dependencies, monitoring quality of work and chasing potential bottlenecks.
- This method makes it easier to figure out a sequence of tasks and duties in the project, allowing project managers and their subordinates to deliver in an effective and efficient manner.

Cons:

- Outlining a bolt chart technique is tedious and requires significant expenses, and ability to deliver.
- Bolt outline strategy doesn't give every single insight regarding the venture and the assignments that it involves.
- It's very mind boggling to scale the time period of the undertakings. **The Precedence Diagramming Method (PDM)**

This graphing strategy is utilized to address connections between exercises, here boxes or hubs are demonstrated as undertakings or exercises which will be performed and bolts are utilized to address connections between exercises. The bolts can accordingly address each of the four prospects.

- FS - finish to begin
- SS - begin to begin
- FF - finish to wrap up
- SF - beginning to end

In PDM required time is labeled alongside the arrows.

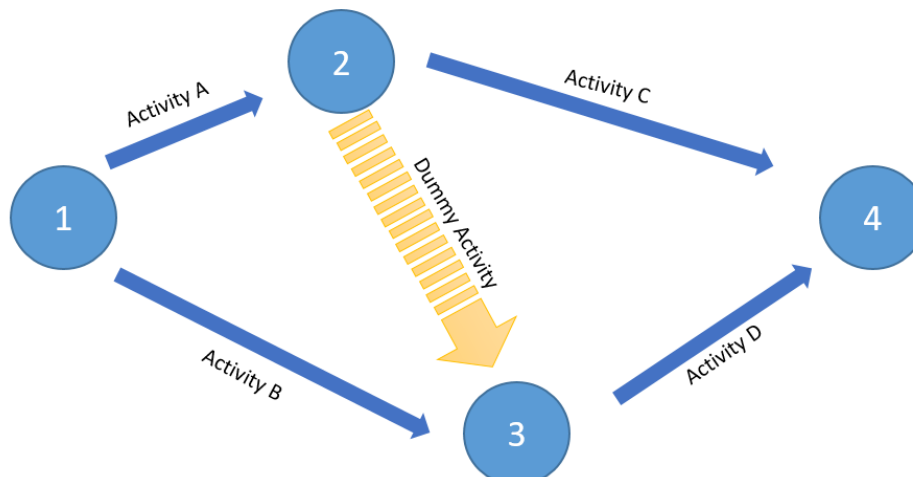


Figure 2: Showing a graphical illustration of a Start to Finish Network Diagram. (Author's Field Work)

Pros:

- PDM is a superior instrument to all the more precisely foster the undertaking plan when contrasted with ADM.
- This outlining strategy plainly talks about the conditions obviously expressing everybody's obligations and obligations.
- It assists with assessing basic exercises and assists with zeroing in on them
- In PDM required time is marked close by the bolts, which assists the partners with scaling the time period of the venture.
- The PDM additionally shows the outcomes and effects happened because of changes in the timetable.
- It shows exercises as stream lines and not moments.

Cons:

- Updating and managing the changes can be a troublesome task and is time consuming.
- It is more complex to update and manage due to less network details.

II. QUESTIONNAIRE ANALYSIS

A total of fifty-five (55) questionnaire was distributed on e-platform to randomly selected individuals on assessment of project planning methods in Nigeria construction industry. There are three sections in the questionnaire; the first section is bio data; the second section is the level of efficiency in planning project and the third section is the most effective in terms of speed of delivery. However, the questionnaire will be analyzed using charts and summary in detail.

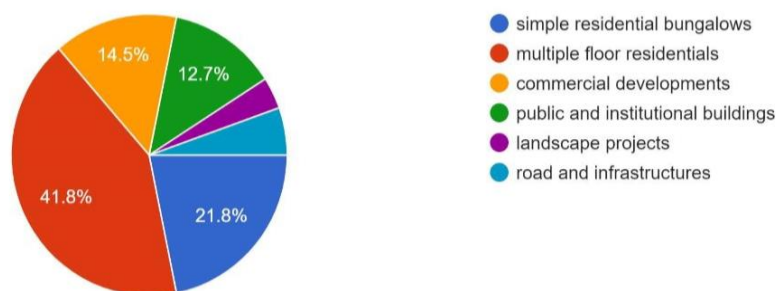
QUESTIONNAIRE: SECTION 1

I. DISCIPLINE OF THE INDIVIDUAL



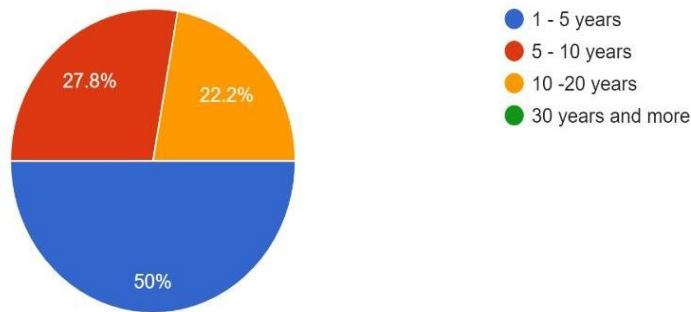
III. EXPERIENCE BASED ON BUILDING SCALE AND TYPE

State experience based on building scale and type
 55 responses



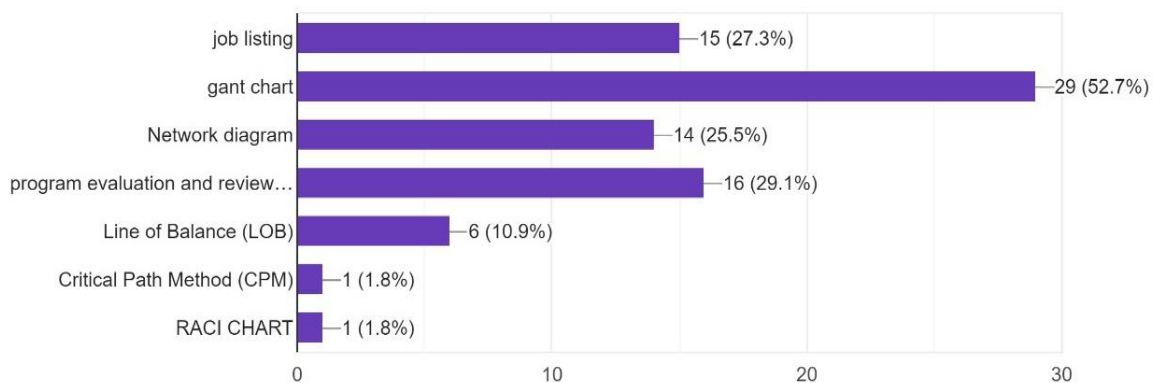
YEARS OF EXPERIENCE

years of experience
 54 responses



PROJECT PLANNING METHODS KNOWN

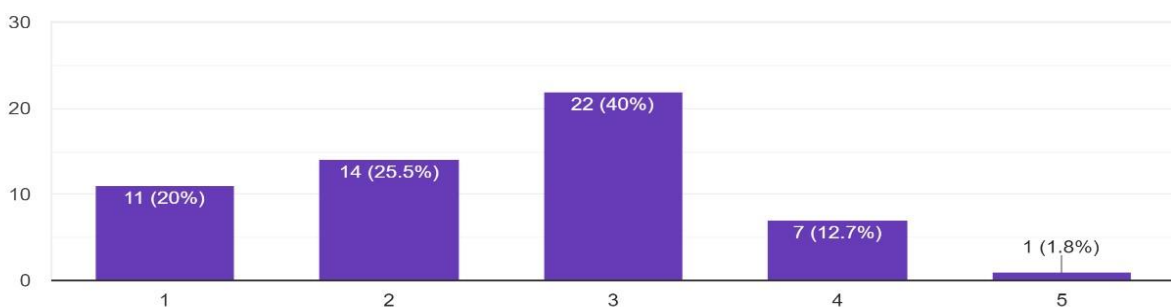
known project planning methods
 55 responses



This clearly shows responses gotten from individuals in the construction and environmental industry which indicates they are professionals and well sought after. Out of the 55 responses, 48 individuals responded on the name of the firm and/or construction company employed. In this section, there are professionals who identified that they have over 20years of experience and below and have worked on different building scales and type, other than construction and they have employ the seven types of project planning methods as shown above. This section also gives a clear insight on the respondent part, inquiring if they are familiar with project planning and this charts clearly shows the analysis. 25.5% of respondent are familiar with Network diagram while the remaining 74.5% are familiar with other methods of project planning. The effect of this on the construction industry is that some of the non- construction professionals will be willing to take on projects using the knowledge of other project planning methods.

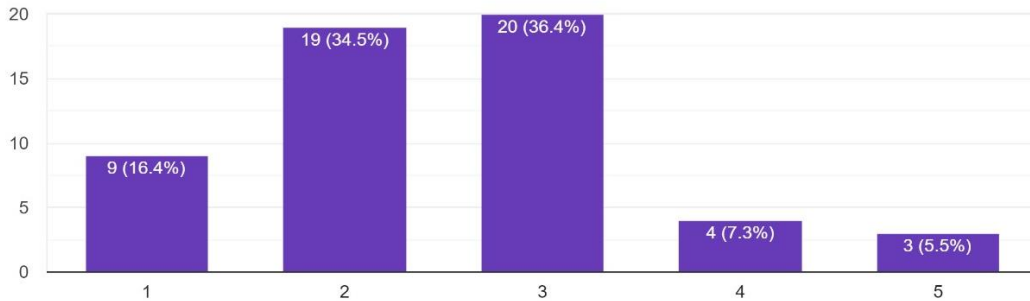
QUESTIONNAIRE: SECTION 2

level of efficiency in planning project using job listing
 55 responses



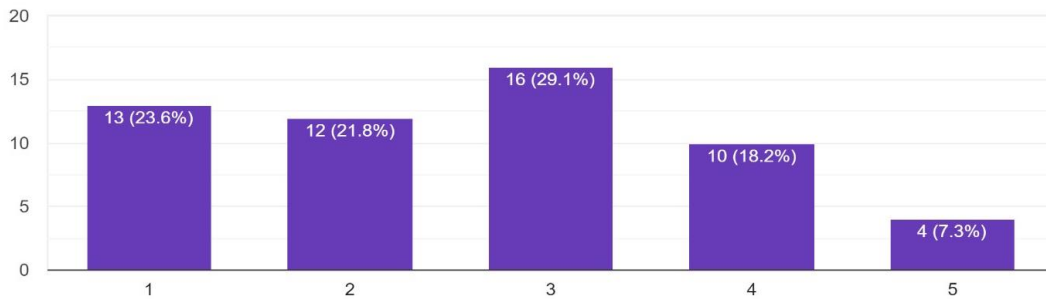
LEVEL OF EFFICIENCY USING JOB LISTING

level of efficiency in planning project using gant chart
 55 responses



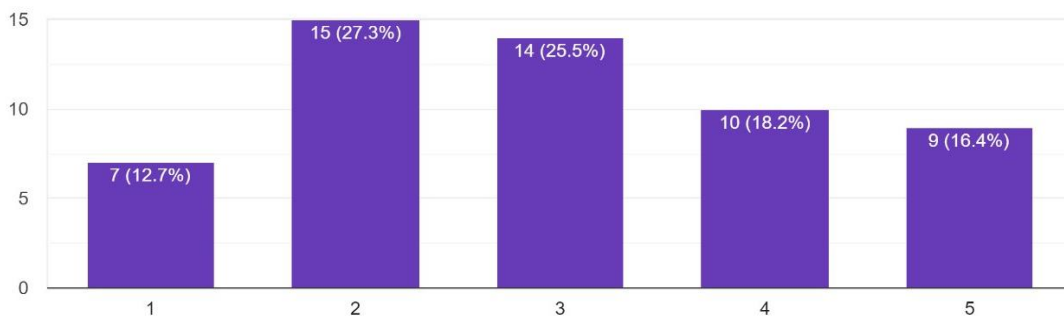
LEVEL OF EFFICIENCY USING GANT CHART

level of efficiency in planning project using Net work diagram
 55 responses



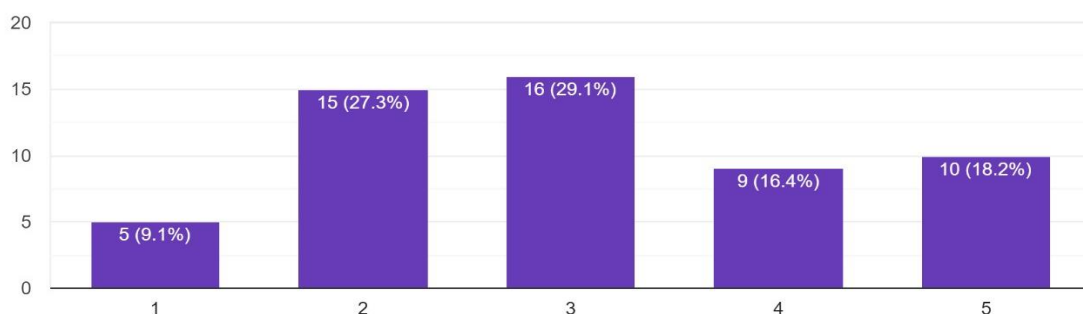
LEVEL OF EFFICIENCY USING NETWORK DIAGRAM

level of efficiency in planning project using PERT
 55 responses



LEVEL OF EFFICIENCY USING PERT

level of efficiency in planning project using LOB
 55 responses



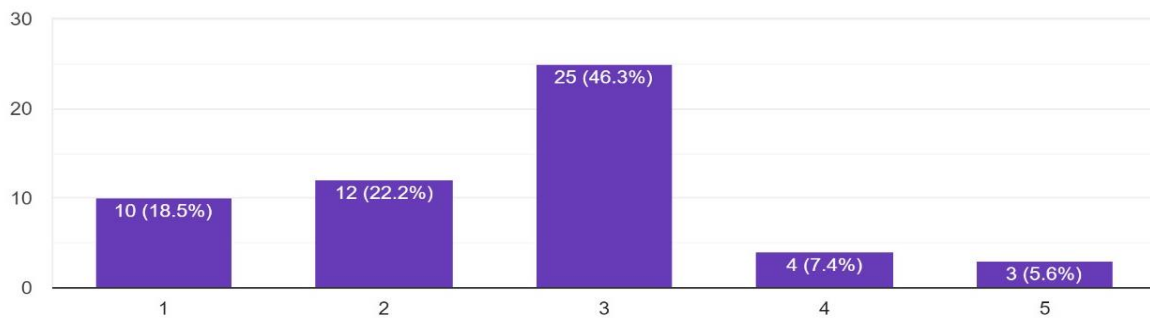
LEVEL OF EFFICIENCY USING LINE OF BALANCE

This part ii of the questionnaire shows the level of efficiency using different project planning methods. From the results above, it can be recorded as a known fact that the different methods of Project planning are been utilized. In these responses, the record clearly shows the percentage to be below 40% for the highest level of efficiency using various project planning methods, which is not up to the average of the total respondents utilizing Network Diagram.

QUESTIONNAIRE: SECTION 3

SPEED OF DELIVERY USING JOB LISTING

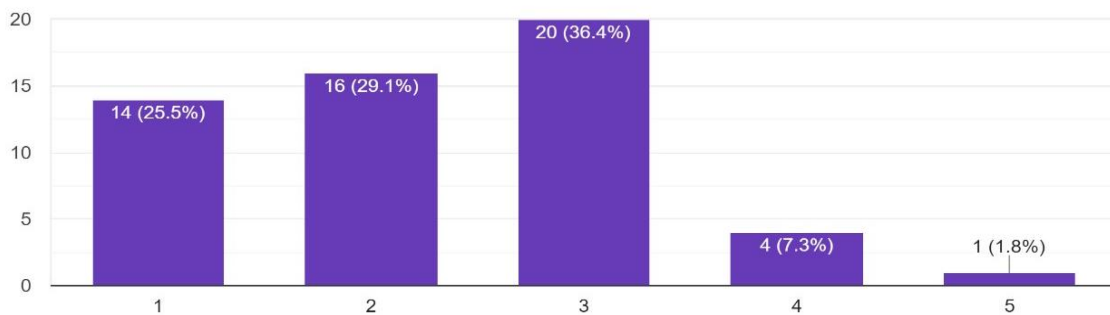
54 responses



SPEED OF DELIVERY USING JOB LISTING

SPEED OF DELIVERY USING GANT CHART

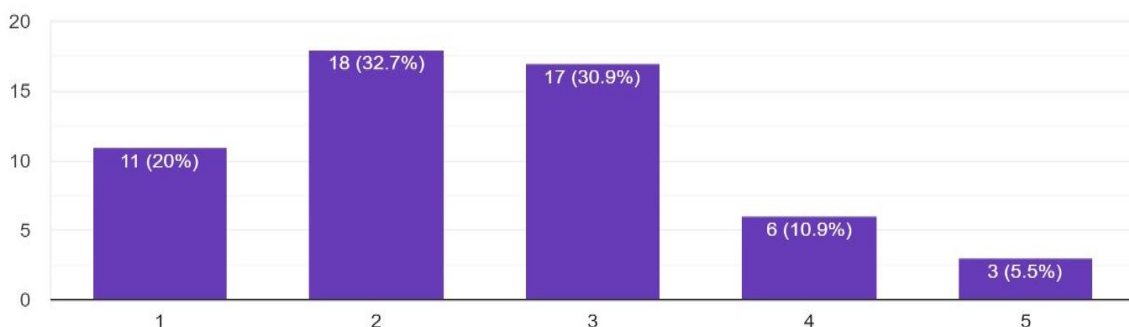
55 responses



SPEED OF DELIVERY USING GANT CHART

NET WORK DIAGRAM

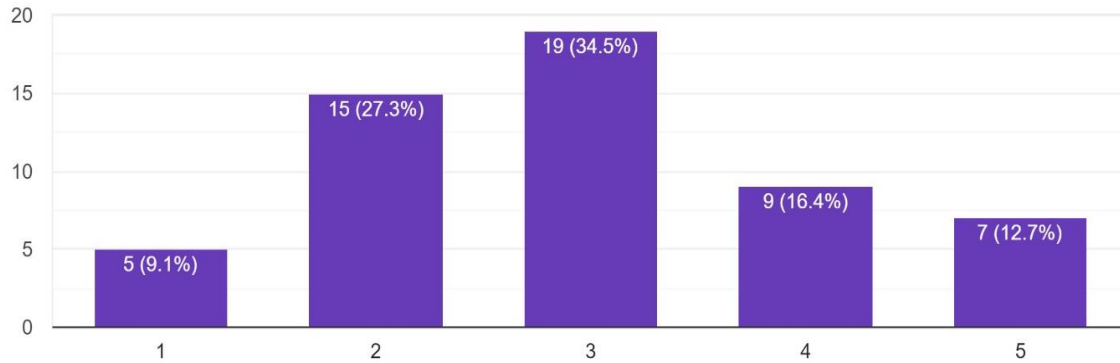
55 responses



SPEED OF DELIVERY USING NETWORK DIAGR

SPEED OF DELIVERY USING PERT

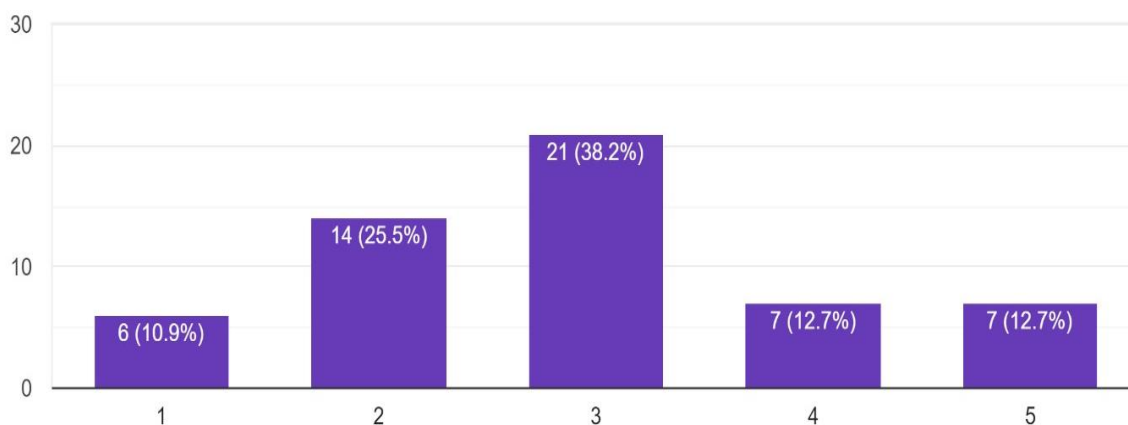
55 responses



SPEED OF DELIVERY USING PERT

SPEED OF DELIVERY USING LOB

55 responses



SPEED OF DELIVERY USING LINE OF BALANCE

This final section analyses speed of delivery using project planning methods. Using Job listing 43.6% has the highest speed of delivery, 36.4% using Gant chart, 32.7% using Network diagram. 34.5% using PERT and 38.2% using Line of Balance.

IV. CONCLUSION

Network diagram helps to show the inter relation between all the activities from start to finish of a project, it is of immense benefits to calculate the project overall duration. This also helps to justify estimated time of any given project irrespective if the scale or magnitude as the relationship between each activity will be clearly showed. Network diagram also helps to visually monitor project status & detail representation to identify critical activities unlike other methods, which can reduce identity risk in terms of time delayed for project activities. Since Network diagram is good in showing the order of project progress duration, and the total path from the beginning of the project till it end, it can be assumed to be the best method for a proper project planning which saves time, it estimate the project estimated duration, and also helps to know the interdependencies among the various activities, being able to see the project team and maximize the diverse opportunities to shorten the duration of the project overall inter-relationship view in general.

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