

FACTORS IN SELECTION OF CONSTRUCTION PROJECT MANAGEMENT SOFTWARE IN INDIA

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Abstract – The construction industry has understood the importance of the use of software in its activities. The software can help them to ease their work and perform it more effectively. However, despite this growth in use, organizations don't have a defined process to determine which software tool would be required for the intended purpose.

The aim of this study was to understand the process of software selection for construction project management. The software considered are Microsoft Project 2016 (MSP) and Primavera P6 R16.1 Professional Project Management (P6). Expert interviews were conducted to understand the software selection process. A total of 15 experts, having an experience from five to thirty years in residential and Infrastructure sectors were contacted for the interview. The experts were asked three questions each to judge the process of software Selection.

After studying the literature reviews and interpreting the Interview, a model is proposed that help us to understand the various factors that influence the decision of the choice of software.

Key Words: Project Management, Microsoft Project, Primavera P6, Software Selection

1. INTRODUCTION

The robust and dynamic nature of the project, along with flexibility required to manage the project for a strict cost budget has compelled the companies to use Project management software in its day-to-day activities. But companies don't have a well-defined manner to select a software. This leads to either selecting a software that is costlier or whose many functions may not be of any use to the company.

1.1 Literature Review

The use of project management software has taken pace in all parts of the world. In their study by Mladen shows that the construction industry of the developed nation uses Project management software for wider range of purposes, while the developing and transitional countries use it now for a very limited purpose. The author makes the point clear that various companies in developing countries have started the use of Software, however they are implemented ineffectively. This paper shows that along with excel, there are two software, Microsoft Project

and Primavera P6, that have use in construction Industry. The study also helps us to identify the various uses of Project management software and shows the difference in use of a developed and a developing economy (Mladen , Mladen , & Zlata , 2012).

In another study by Ali & Money they presented a comprehensive and elaborate description of the various parameter that drive the choice of project management (PM) software. The paper also talks on the concept of Technology Acceptance Model (TAM), based on the Theory of Reasoned Action. The model takes input in form of software characteristic, user characteristic and project characteristic. Secondly the impact of using software on productivity and overall performance of the company to be studied. The former form the part of use of PM software while the later form the part of Perceived Performance (Ali & Money, 2005).

In their report Marti & O'Brien shows that use of project management software is becoming an effective tool to manage large projects and there is a rapid increase in their use. Their paper also helps in understanding the parameters one might consider while making the choice of which software to use. Ease of use, Critical path reporting, Documentation /Reporting, Network ability /Portability, Scheduling Project Communication, Flexibility (Marti & O'Brien, January 2005).

2. Objective

The objective of the study was to determine the factors that are considered for selection of a Construction Project management software.

These factors are further analyzed to understand how each factor affects choice of software.

3. Methodology

After the selection of research topic, literature was reviewed to understand the study that have been done in the topic. Then research questions were prepared, and Experts were selected. Then the experts were interviewed, and their response were interpreted, and a selection model was proposed.

3.1 Interview Details

A total of 15 experts were interviewed, who have worked in residential, infrastructure or both sector.

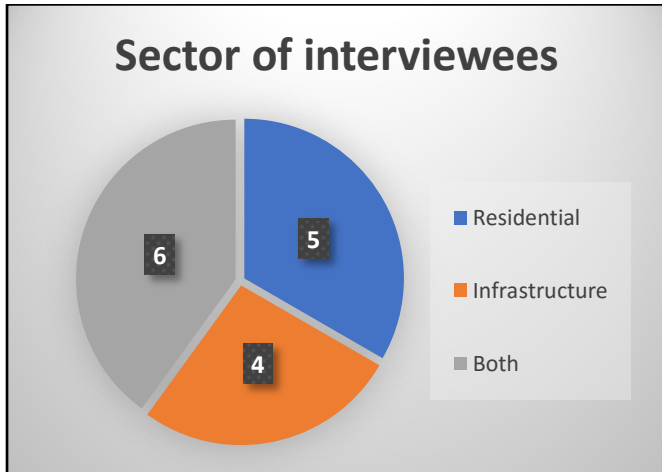


Chart 1 Interviewee Sector of Experience

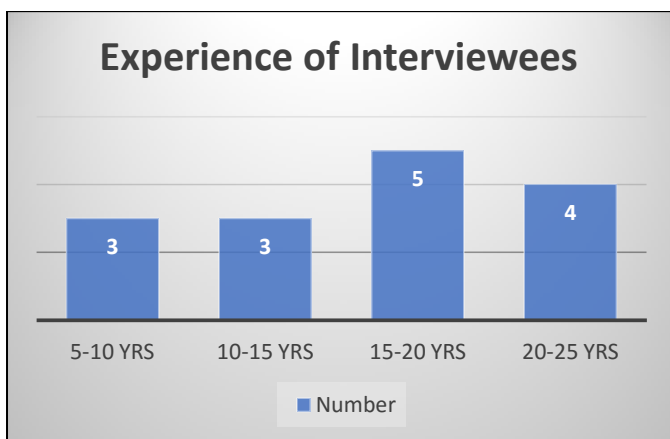


Chart 2 Experience of Interviewees in years

Three questions were asked to each of the respondents. The questions were as follow

1. Which software you prefer and why?
2. When to use either of the software?
3. The future of two software?

4. Data Analysis

The response from the interviewees was analyzed to generate the following model.

4.1 Software Selection Model

The following model is proposed after studying the responses of the interviews.

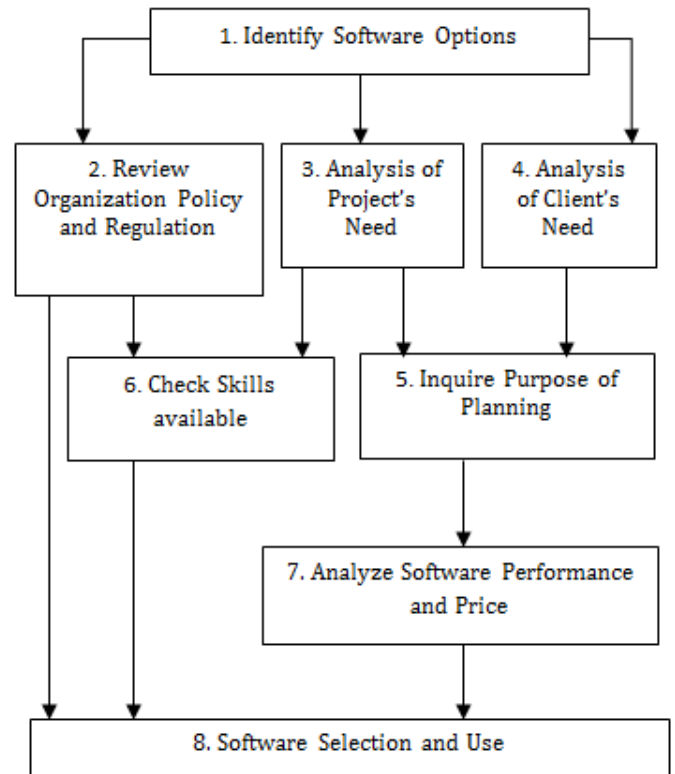


Figure 1 Proposed Software Selection Model

4.2 Model Interpretation

The various steps involved in a software selection process have been identified. These steps are generated from the opinion that the expert suggested, and the literature review referred. The details of each of the step is as followed:

1. Identify Software Options

As the heading suggest, the selection begins by identifying the potential software that exist in the market for the relevant work. This list can be shortened by using popular existing software or company's experience with work. At least two to three software must be considered for comparison.

2. Review Organization Policy and Regulation

Many organizations have certain policy that direct the company to use a software. These regulations govern the choice of software. Company are either very happy with the success that the software has generated in the past or are simply too adamant to change. Mostly the decision given by project manager govern the choice of software, which is based on familiarity in use or ease of operation.

An example of the above situation can be taken for projects that are receive funds from two of the most esteem funding agencies. If a project is funded from United nation, they would ask to prefer Microsoft Project while if

it is funded by World bank, they would prefer Primavera P6.

A yet another policy that companies are adopting is that they use different software at different level of organization. They prefer to use Microsoft Project at project level while use Primavera P6 at regional or zonal level. This ensures a cost effective and better control over their projects.

3. Analysis of Project's Need

Every project is unique and has special needs. A project management software choice is largely dependent to the type of project and level of complexity involved. A proper need analysis of project would help us understand the requirements of the project and further we can easily map them to the choice of software. Certain criteria have been defined that can help decide for the software

Scope of project is one such parameter.

- If scope < 300 crore. MSP is appropriate
- If scope > 300 crore. P6 is appropriate

Number of activities and Relationship among them is another parameter

- If Number of activities < 300. MSP is appropriate
- If Number of activities >300. P6 is appropriate
- If multiple relationship exists between activities, P6 is appropriate

Multiple user access for monitoring and updating the project is another parameter

- If Multiple user access is required, then P6 is suitable
- If Multiple user access is not required, then MSP is suitable

Type of project

- If the project is residential purpose or small infrastructure work MSP is suitable
- If the project is for large infrastructure work, P6 is suitable

4. Analysis of Client's Need

Client needs play a major role in software selection. It is he who decides the purpose the software will fulfil. Certain criteria have been defined that can help decide for the software

Client level of control and analysis

- If client wants a program level or multi-project control and analysis, P6 is suitable

- If client want software to function for singular project, MSP is suitable

The factors that client need to be incorporated in the planning and scheduling of activities can be considered for deciding choice of software. **A 3-factor model comprising of Time, Resource, Cost can be used.** The choice of software can be made on what elements the schedule will consist of.

- Only Time -> MSP
- Time + Resource -> MSP
- Time + Cost -> MSP
- Time + Resource + Cost -> P6
- Only Resource/cost can be covered in excel

5. Inquire Purpose of Planning

The degree of detail, purpose of planning and schedule and how a software can fulfil that need to be studied. This will further help to select a software which can serve the purpose better. Certain criteria have been defined that can help decide for the software

The level of detailing required in planning and scheduling of activities determine choice of software.

- If a schedule is to be used for representation purpose or Non-construction work, MSP would be suitable
- If only time-line is required in form a bar-chart to observe dates, MSP would be suitable
- If a detail schedule is required and involves better monitor and control, along with delay and risk analysis, P6 is suitable

The stage of planning required can also affect use of software. Planning in initial phase of project can be done on MSP and then as project moves onto next phase, the file can be exported to P6

6. Analyze Software Performance and Price

The function and price of the software are one of the most important feature that will govern the choice of software. They can help us make decision keep the requirement in mind and how the software will fulfil them. The software need to be compared on various similar parameters, and their efficiency can help us make decision of choice of software. Certain criteria have been defined that can help decide for the software

Operational characteristics are as follow

- Time Management Functions
- Resource Management Functions
- Cost Management Functions
- Reporting Functions
- Control and Monitor Functions

General Characteristics are as follow

- Compatibility Functions
- Security Functions
- Technical Support
- User Friendliness

7. Check Skills available

The availability of skill is yet another parameter that need to be studied before making choice of using a software. Also, certain companies have policy that direct them to train their employees in use of certain software, so they would opt to work in that software. Also, project needs must match with the skill set available so that the desired software could be made to use.

8. Software Selection and Use

And finally, a software is selected and worked upon. A performance check must be done on the software to check if it fulfils its purpose and to check if the decision made was correct or not.

5. Conclusion

The study helps us to understand the parameter involved while selecting a project management software for construction project. A model is proposed that needs to be follow for a proper selection of a software tool. This model helped us focus on various parameter which can be categorized as project specific parameter and General parameters. The project specific parameters are Review Organization Policy and Regulation, Analysis of Project's Need, Analysis of Client's Need, Inquire Purpose of Planning, Check Skills available. The General Parameter is to Analyze Software Performance and Price.

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REFERENCES

1. Ali, A., & Money, W. (2005). A study of project management system acceptance. 38th Hawaii International Conference on System Sciences, (p. 11). Washington.
2. Marti, M. M., & O'Brien, K. L. (January 2005). Practical applications for improved project management. Office of Research Services. Minnesota: Minnesota Local Road Research Board.
3. Mladen , V., Mladen , R., & Zlata , D. (2012, Feb). The use of project management software in

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BIOGRAPHY

Keshav Phophalia is pursuing MBA in Construction Project management at RICS School of Built Environment, Noida. He is currently in 4th semester and is looking to pursue career in Construction Project management domain.