Comparison and Assessment of Using Primavera and Microsoft Project in Construction Projects in Erbil City

Khalil Ismail Wali1,
Asst. Prof. in Civil Eng, , Salahaddin
University
Erbil, Iraq

Shamal Ali Othman2*
MSc Candidate in Civil Eng. Salahaddin
University
Erbil, Iraq

[1] Khalil.wali@su.edu.krd ,

[2]*eng.shamal@yahoo.com*

ABSTRACT

Planning and scheduling has an important role in construction projects because of the increasing complexities in the field of project management comprises, pre-construction planning in order to schedule the activities sequence, defining labor tasks, construction methods and assigning the resources and responsibilities. For planning and scheduling work a huge amount of paperwork is required, which makes the construction management task more complicated. This paper provides a comparison study to currently available project management tools and assessing Primavera and Microsoft project, to identify the most popular planning project tools. Consequently, to developed criteria to compare primavera with Microsoft project, and to investigate the current situation of using Primavera and Microsoft project in Erbil governorate. The result of the analysis the questionnaire data revealed that 78% of respondents were reluctant to use Primavera and Microsoft project in construction projects in Erbil governorate. Consequently, the most of respondents preferred to use Excel Microsoft for managing project because of its availability and easy in using, on other hand, the respondent's knowledge regarding the most advantages program, the study revealed that 76% of the respondents they do not know which program is best one and the most of respondents suffer from lack of experience and lack of training opportunity to tackle and learning primavera and Microsoft project. Furthermore, most of the respondents preferred using the traditional process rather than software to schedule by hand instead of using Primavera and Microsoft project.

Keywords: Primavera P6; Microsoft Project; Project Management Software Tools.

1. INTRODUCTION

In the past, before developing software science there were not any program used in construction project management. The contractor executed projects without planning or scheduling. Nowadays, the number of automated project management tools available in the market is increasing rapidly (Cicibas et al., 2010). With critical advancement of these tools various software project management tools have been used by project managers to plan and track their project tasks. These tools are mainly utilized in arranging, checking and controlling projects. Primavera and Microsoft project is broadly utilized for planning and scheduling projects. Planning of enormous activities requires a huge amount of paperwork, which can be diminished with the assistance of Primavera and Microsoft project software. Microsoft Project is a tool for implementing project management principles and practices that can help you succeed (Marmel, 2011). Primavera is a product suite designed to support the project management needs of organizations that manage large numbers of projects at one time. The comparison and assessment are made to know the effectiveness of each software. Microsoft Project and Primavera is the modern tool of project management that help project managers to plan and tracking project activities. It helps for the ideal and creative organization of activities which gives the fantasy to finish the project in planned duration and within the financial plan (Ragavi and Uma, 2016).

Microsoft Project is a powerful program that you can use to plan and manage a wide range of projects. From meeting crucial deadlines and budgets to selecting the right resources, projects can be more productive and realize better results by utilizing the set of highlights Microsoft Project offers, hence Microsoft Project 2016 can be used to carry out the following tasks (Chatfield and Johnson, 2016):

1. Create a detail plan and schedule for the project

2. Control what project activity can schedule manually rather than schedule automatically.

3. Prepare and manage tasks, resources, work, and costs at whatever level of detail is appropriate for project requirements.

4. Work with your plan's data in a variety of views and reports submission.

5. Track and manage plan from starting to close out the project.

6. Collaborate and share data with others in the organization.

Oracle Primavera P6 Enterprise Project Portfolio Management (P6 EPPM) is a strong and simple to-utilize coordinated solution for all around organizing, planning, managing, and executing ventures, projects, and portfolios. Primavera P6 can be used to conduct the followings tasks (Oracle, 2015) :

1. Manage, Plan and schedule the right strategy of projects.
2. Mange project cost and resource management decisions.
3. Improve group coordinated effort and work process efficiency.
4. Maximize each project contributor's skills and responsibilities.
5. Tracking and progress measurements.

The objective of the Study

The main objectives of this study are as follows:

1. Evaluate the main differences between Primavera and Microsoft project.

2. Identify the most popular software tool used in Erbil city.

3. Determining the current situation of using project management tools in the construction industry in Erbil city

Top Ten Project Management Software Tools

A huge number of project management software tools exists today. Project management zone is the official web site and activity to gather and present data on project management systems. The project management zone ranking is a rundown of project management software tools positioned by their present popularity in different classifications. The list is updated monthly, this list consists of 218 project planning tools and ranked them according to their popularity (zone, 2017). According to the last update, Microsoft project ranked as a first popular program and Primavera ranked as a third popular program in between ten top ranking planning programs used in construction management as shown in Tab.1

Table 1 Top ten Project Management Planning Tools

Rank			System	Score		
Oct 2018	Sep 2018	Oct 2017		Oct 2018	Sep 2018	Oct 2017
1.	1.	1.	Microsoft Project	2,834.16	-155.74	-1,021.40
2.	2.	2.	JIRA	1,232.11	-10.48	+82.60
3.	3.	3.	Primavera	1,012.79	-18.18	-69.59
4.	4.	4.	Trello	762.48	+8.18	+195.96
5.	5.	6.	Asana	375.61	+17.14	+58.89
6.	6.	5.	Basecamp	353.57	+11.61	-27.63
7.	7.	7.	Zoho	260.86	+4.00	+52.62
8.	8.	8.	Smartsheet	239.14	+9.98	+50.08
9.	9.	9.	Wrike	116.24	+0.28	-5.37
10.	10.	10.	Team Foundation Server	82.70	+4.38	-5.58

Comparison between Microsoft Project and Primavera P6

Primavera and Microsoft project are the most popular software for project planning, reporting, and progress updating and tracking. Both the software used worldwide and they have their own benefits, Tab.2 shows the main differences between Microsoft Project 2010 and Primavera P6 version 15.1.

Table 2. Main differences between Microsoft Project 2010 and Primavera P6 version 15.1

No	Microsoft project 2010 (Chatfield and Johnson, 2017, Chatfield and Johnson, 2010)	Primavera P6 version 15.1 (Oracle, 2015)
1	Can save up to 11 Baselines.	In Primavera, Unlimited Baselines can be created.
2	Allows creating different types of working day or non-working day repeat patterns.	manually create different types of the working day or non-working day.
3	Lacks the feature of tracking project issues or risks.	Primavera allows recording issues and risks.
4	Only one relationship can be made between two activities	More than one type of relationship can be established between activities e.g. allows having the finish to finish(FF) and start to start (Assaf and Al-Hejji) between the same two activities.
5	Work breakdown structure (WBS) is generally implemented using summaries. Create a new WBS level by indenting from the line above. This method allows for creating a system on the same screen.	In primavera work break structure should be created firstly then possible to add activities with each WBS element.

Literature Review

Liberatore et al. (2001) concentrated on future research and utilized project management software in the construction industry. Information was drawn from an observational examination of project management professionals that yielded 240 answers, 42 of which were from the construction industry. The outcomes demonstrated that construction experts have diverse attributes, needs, and inclinations, as compared to the general sample the investigation demonstrated that construction experts were more experienced and instructed than the respondents in the general examination, they would in general work on fewer tasks with bigger numbers of activities, and they were more likely to utilize Primavera than Microsoft Project.

Cicibas et al. (2010) given an examination of a lot of project management software tools. First, they created criteria to figure out which PMSTs would be liable to examination. Then, they created criteria to analyze and assess these PMSTs. Finally, they made a table and delineated the primary contrasts between a set of project management software tools including Primavera, Microsoft project and other software tools. Twelve criteria were chosen and characterized to look at and assess software project management tools.

Gharaibeh (2014) evaluated the effectiveness of Microsoft project and Primavera in terms of usefulness and cost, and produce a summary of the evaluation records. the investigation has been done by questionnaire survey method. The discoveries of this examination uncovered contrasts between the Primavera and Microsoft venture under scrutiny and featured the quality and shortcoming of every application. The author was able to evaluate the productivity of each software package and gave a score to each quality, which encourages the client to see how the software package performs.

Damiani et al. (2015) conducted a survey and comparison of a series of project management software used by engineering, procurement and construction companies to evaluate the best software tools based on chosen features. After a brief description of the features required by a project management tool and after a brief description of the software tools in the exam, the authors applied the analytic hierarchy process method to the software cross evaluating each of their features. They discovered in the research that Primavera is the most proper software to be used. Of course, Primavera is the most frequent PMS used in the construction industry.

2. MATERIALS and METHODS

To investigate the current situation of using Primavera and Microsoft project in Construction Projects, the researchers collected an enormous amount of data for both software users in Erbil city. The method of collecting data based on preparing a survey in terms of questionnaire method as this method will enable the collection of a large amount of data from a variety of software users in several locations and from different industries. The researcher used an online questionnaire which made by google forms. Google Forms is a tool that allows collecting information from users via a personalized survey or quiz. The information is then collected and automatically connected to a spreadsheet. The researcher sends the questionnaire link to a group of engineers in Erbil city, and out of 120 questionnaires distributed only 46 completed questionnaires received. Then, the Statistical Package for Social Sciences, Version 22 (SPSS) program used for statistical analysis of the questionnaire data.

3. DATA ANALYSIS

The questionnaire form consists of 10 various questions. The first four questions were related to the respondent's profiles in the construction industry, the major type of work, respondent's designation and work experience, while other questions related to the current situation and comparison between Microsoft Project and Primavera.

Profiles of Respondents

The first four questions of the questionnaire are related to the general information about the respondents and projects. This information includes the sector in the construction industry, a major type of work, respondent's designation and work experience. Analyzing the respondent's data by using SPSS22, shows that 56.5% of total respondents were government engineers (public sector), while the remaining 43.5% were contractor engineer (private sector). The percentage of respondents having experiences 4 to 7 years and 8 to 12 years the same of 35% and while respondents having more than 12 years is 19%. The respondents from 1 to 3 years of experience account for 11%. Furthermore, 46% of the respondents were working in the building sector, 35% in roads and 19% in water and sewage sector. Regarding the respondents' designation shown that 50% were site engineers and 39% were project managers and only 11% as office engineers as illustrated in Tab.3.

Table 3. Profiles of Respondents.

Question		Percent
The major type of work involved	Water and Sewage	19%
	Buildings	46%
	Roads	35%
Respondents designation	Project Manager	39%
	Site Engineer	50%
	Office Engineer	11%
Relevant working experience (Years)	1-3 Years	11%
	4-7 Years	35%
	8-12 Years	35%
	More than 12 years	19%

Assessment the respondent's knowledge regarding Microsoft project and Primavera tools

In the second part of the questionnaire, the respondents requested to answer the question about their knowledge on using both application Primavera and Microsoft project program and, the respondents requested to state whether they used any of type of project management program during managing project in Erbil city. Consequently, to distinguish between the Primavera and Microsoft project and to state the reason for such selection, the analysis of the data revealed that the most of respondents do not have any information about Microsoft Project and Primavera. Specifically,78% of total respondents revealed that they do not have information about Primavera, while 65% of total respondents revealed that they do not have information about Microsoft project, as shown in Tab.4.

Table 4. The respondent's information about Primavera and Microsoft project

Question		Percent
Do you have information about Primavera	Yes	22%
	No	78%
Do you have information about Microsoft project	Yes	35%
	No	65%

This study also showed that 78% of respondents never used these programs in project management, while only 13% of total respondents use only Microsoft project. Whereas, only 2% used Primavera for managing the project. While only 7% of total respondents used both Primavera and Microsoft project in managing project as shown in Fig.1.
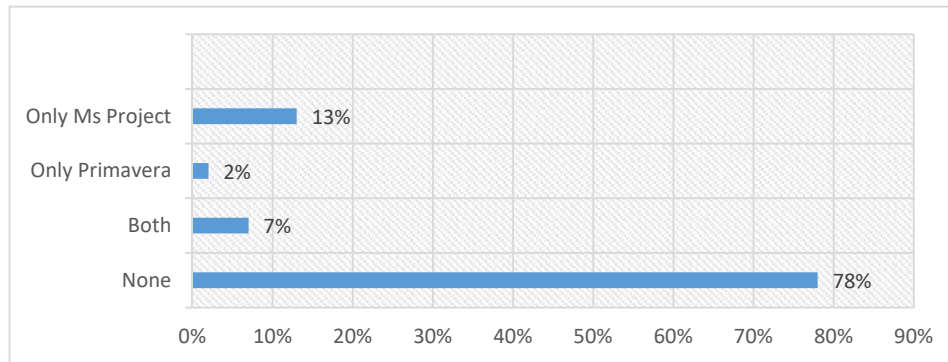

Figure 1 . Percentage of using Primavera and Microsoft Project

To evaluate the respondent's knowledge regarding the most advantages program, the study revealed that 76% of the respondents they do not know which program is best one, while 17% of total respondents think that Microsoft project is better than Primavera, whereas only 7% of the respondents selected Primavera program as the best application for managing construction project as shown in Fig.2.
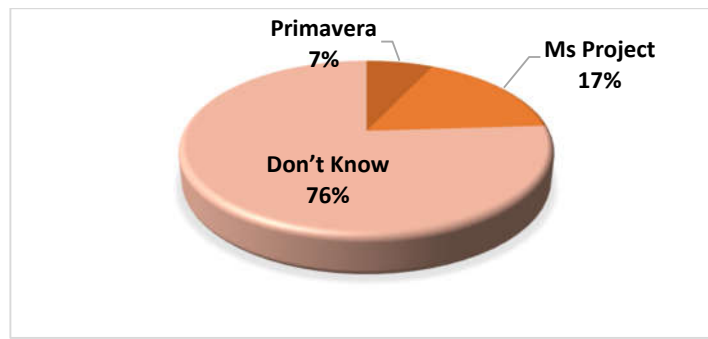
Figure 2 The respondent's evaluation for program selection

The current study examined the fields in which Primavera and Microsoft project were used, it is found that the field of cost controlling, time controlling was the most areas used in a rate of 30% for each, whereas only 15% of the respondents used programs for resources allocation and 25% using them in other field purposes as shown in Fig.3.
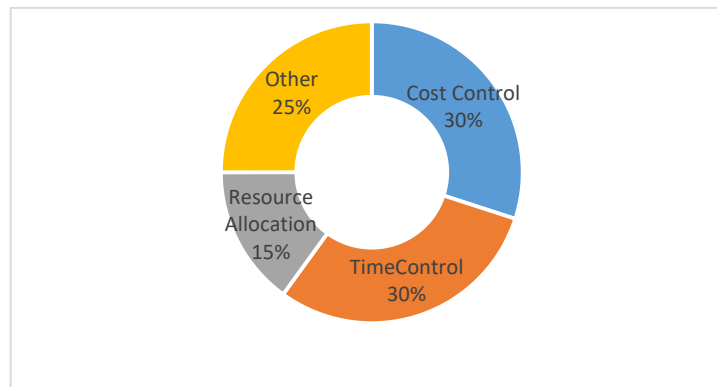

Figure 3 Using Primavera and Microsoft Project in various fields

This study also identified the reasons behind the reluctance of most of the respondents to use   Primavera and Microsoft Project in construction projects in Erbil city due to the lack of experience and absent of training opportunity to tackle and learning primavera and Microsoft project. Furthermore, most of the respondents preferred using the traditional process rather than software tools to schedule by hand instead of using Primavera and Microsoft Project.

4. CONCLUSIONS

This study examined the popularity of using Primavera and Microsoft project in construction projects in Erbil City, the result finding indicated that in the comparison between Primavera and Microsoft project it found that 34.8% of respondents had knowledge about Microsoft rather than only 21.7% of respondents had knowledge regarding Primavera. On the other hand, only 13% of respondents used Microsoft Project compared to only 2% used Primavera, whereas 78% they used neither Microsoft Project nor Primavera, the results indicate that despite the low use of both techniques but the Microsoft Project comes in the first priority of the respondents. In addition, the findings extend to the reasons behind the limitation of using such program in construction projects because of lack of experience and poor training program; hence, the most of project managers preferred to use traditional methods rather than using Microsoft project and Primavera programs. To overcome this problem, it is recommended to enhance the training program for construction engineers as well as to improve the teaching syllabus in College of Engineering towards deployment the construction management tools.

5. REFERENCES

ASSAF, S. A. & AL-HEJJI, S. 2006. Causes of delay in large construction projects. International journal of project management, 24, 349-357.

CHATFIELD, C. & JOHNSON, T. 2016. Microsoft Project 2016 Step by Step.

CHATFIELD, C. & JOHNSON, T. 2017. Microsoft Project 2016 Korak po korak.

CHATFIELD, C. S. & JOHNSON, T. D. 2010. Microsoft Project 2010 step by step, Pearson Education.

CICIBAS, H., UNAL, O. & DEMIR, K. A. A Comparison of Project Management Software Tools (PMST). Software Engineering Research and Practice, 2010. 560-565.

DAMIANI, L., REVETRIA, R., SVILENOVA, I. & GIRIBONE, P. 2015. Survey and comparison of the project management softwares used by engineering, procurement and construction companies. Advances in Energy and Environmental Science and Engineering, 6.

GHARAIBEH, H. 2014. Evaluating Project Management Software Packages Using a Scoring Model—A Comparison between MS Project and Primavera. Journal of Software Engineering and Applications, 7, 541.

HAWKINS, C. V. 2007. Assessing CPM scheduling software for the small to mid-size construction firm, University of Maryland, College Park.

LIBERATORE, M. J., POLLACK-JOHNSON, B. & SMITH, C. A. 2001. Project management in construction: Software use and research directions. Journal of construction engineering and management, 127, 101-107.

MARMEL, E. 2011. Microsoft Project 2007 Bible, John Wiley & Sons.

ORACLE 2015. P6 user guide release 15.1.

RAGAVI, S. & UMA, R. N. 2016. Review of Project Management Softwares-MS Project and Primavera. International Research Journal of Engineering and Technology (IRJET), 3, 4.

VEENA H C, V. K. 2016. "Schedule Control of an Apartment Building using

Primavera Techniques". International Journal of Engineering Research & Technology (IJERT), 5, 4.

ZONE, P. M. 2018. project management zone [Online]. Available: https://project-management.zone/ranking/category/planning [Accessed].