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Sarmad Mohammad
Faculty of Computing, Arab Open University (AOU), Kingdom of Bahrain., sarmad@aou.org.bh

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Effective Analysis for Usability of Applications Software

Sarmad Mohammad[*]

Faculty of Computing, Arab Open University (AOU), Kingdom of Bahrain.

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Abstract: The main objective of this research is to determine the degree of usage for specific applications software, project management (PM) software has been taken as a case study in order to develop and enhance usability of PM software in Kingdom of Bahrain. This study also aims to find out new approach to make the use of project management more effective and efficient as possible. It has started with overview of the framework of project management and the current way to deal with project software. Functionality versus complexity and SWOT analysis are conducted to find out the weak point in the current process; to check for the chance of enhancement and to find a new opportunity for improvement to empower the current strength and to construct an effective metrics to measure usability as significant issues of most frequently applications software implemented in kingdom of Bahrain. The problem mainly states that the users of PM software not take the full advantage of the information technology which raises the questions of how much users rely on the PM software and degree to measure user's satisfaction with the software.

Keywords: Empirical software engineering, SWOT-functionality versus complexity analysis, effectiveness and efficiency of PM software usability.

1 Introduction

Many users deal with projects in their life without even realizing project requirements and specifications. Some users consider that a project should be large and complex tasks that take too much time and cost to do it. However, the project is defined as any activities that produce unique product or service; it ranges from small set of activities to huge complex activities. Also the project means a group of people collaborates to reach specific goal.

PMI "Project Management Institute" defined the project as a temporary Endeavour to produce unique result [1-7]. PMI differentiates between the project and the operation, the project should be temporary and produce unique products, and on the other hand the operation is a repetitive process to produce usual products. There is a starting point for everything; the projects exist before even the term "project" is created. Users manage and coordinate their effort and collaborate together to achieve intended result. This fact matches with the definition of project management which is planning, organizing, motivating, and controlling resource to achieve a goal. The importance of PM software in kingdom of Bahrain is that organizations become more productive by using software in (innovation, integration, information and automation) as shown in Figure (1), in order to complete a greater number of tasks in less time and reduced cost by using automation with prior to their invention to deal with vast amounts of information and process it quickly [3-6].

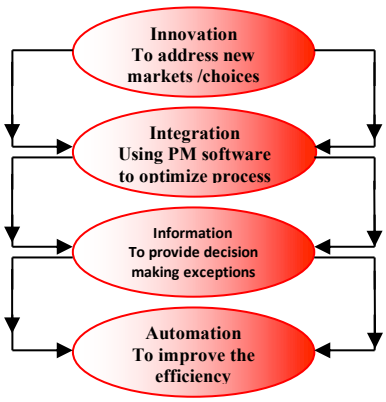

Fig. 1: Usage of PM software in an organization as (innovation, integration, information and automation).

[*]Corresponding author E-mail: sarmad@aou.org.bh

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2 Methodologies

Analysis of PM software methodologies is oriented to following research metrics [4,5]:

A- Types of PM software.
B- Applications of PM software
C- Benefits of using PM software:
D- Convenience of PM software
E- Types of chart in PM software;
F- Users level of knowledge with PM software.

The results in Figure (2-A-F) show different metrics profile given above of PM software usage in kingdom of Bahrain, where the survey is distributed on line for public and private organizations with population more than 200 responders, outcomes of survey respectively are shown in Figure2-A indicates a high percentage (81%) of Microsoft project management software usage, while Figure-2-B illustrates different types of applications which contain many functions that help the user to make the project work more easier, the majority of the respondents are using the planning feature mostly in the project management software with 62% of them, while 28% of them are using the project management software for monitoring and controlling purpose and only 9% of them are using PM software for execution purpose, while Figure-2-C illustrates the benefits of using PM software: Project management software's have many features, 21% of the respondent believes that the cost and budget controlling are the most attractive feature to them, 45% of them believe that measuring work performance accurately is the best feature to them, 34% of them believe that time and resource management is the best features. In Figure2-D, 52% percentage of the respondent believe that the project management software having many functions is the most attractive advantage, while 32% of them believe that reducing cost is the best advantage and 15% of them agree the best thing about the project management software is the ease of use. Figure-2-E shows that the majority agrees by 88% that they are using Gantt chart in the project; while last part of Figure 2-F show that 37% of the respondents are in a moderate level of familiarity, 31% of them consider themselves as professional users, 20% of them are experts and only 12% consider themselves as beginners.

Finally to measure software effectiveness means that the capability of a software system to carry out the specified task successfully as a function of two components, the quantity of the task is attempted by the users, and the quality of goals given as function by following three equations:
Software Effectiveness = f (Quantity, Quality)

Software effectiveness percentage = (Quantity*Quality)/100 % …… (1)
User and Corporate efficiency can be measured by following equations:

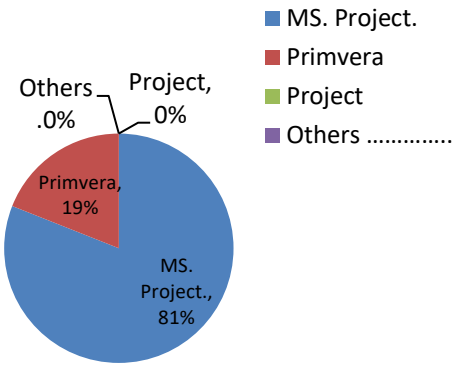

Fig. 2 -A. Type of PM software used.

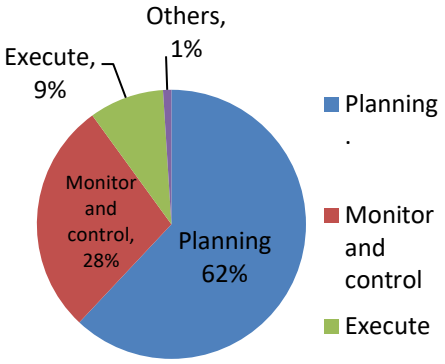

Fig. 2-B. Applications of PM software.

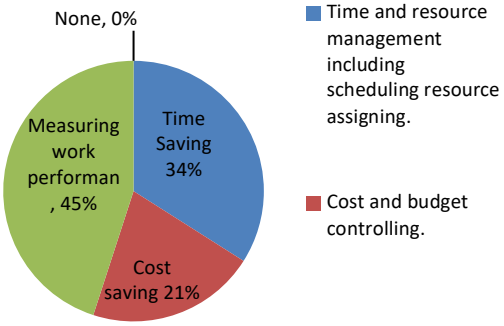

Fig. 2-C. Benefits of using PM software.

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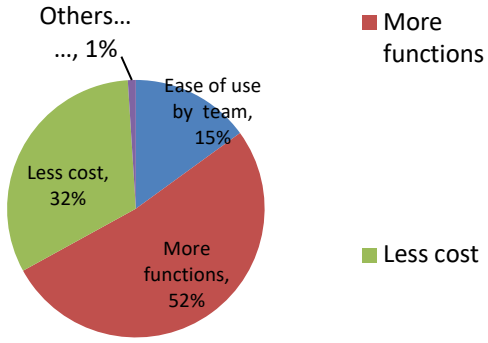

Fig. 2-D. Convenience of PM software .

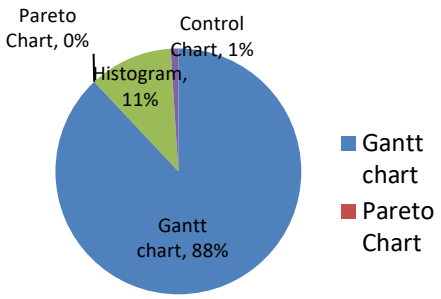

Fig. 2-E. Type of chart in PM software.

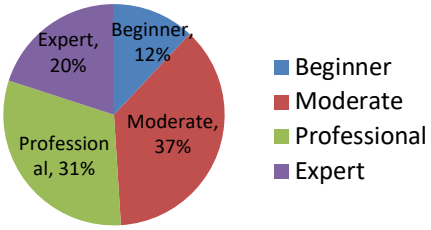

Fig. 2- F. User level of PM software.

User Efficiency (E) = Effectiveness / Task time ... (2)
where Task time is equal to time spent by user to complete the specific task

Corporate Efficiency = Effectiveness /Total cost... (3)
Where Total cost = Cost of labor + Cost of resources + Cost of training

The effectiveness and efficiency of PM usability are calculated by equations given in (1, 2 and 3) as outcomes of 200 responders in range of (60-70%), so average value is 65% which reflect actual effective usability of PM software.

3 Case Study: Frequently-used Microsoft PM Software (functionality versus complexity analysis)

Outcomes of Figure2-A show a high-level usage of Microsoft project management software in kingdom of Bahrain, and a summary of some tested functionality versus complexity analysis is show in Table -1 and Figure 3.

Table 1: Summary of functionality versus complexity analysis

• **Functionality**	• **Complexity**
The scheduling and reporting functions of **PERT** chart is given in Figure 3 as a sample of MS project management tool used to schedule, organize, and coordinate tasks within a project. **PERT** stands for Program Evaluation Review Technique in collaborating with team members.	This function complexity is high and require knowledge and training from team member in (PM) project management
Budget Management, Web based workflow governance & milestone tracking.	This function complexity is also high and it needs a special training.
Excel like text wrapping, filtering & auto complete.	This function complexity is easy

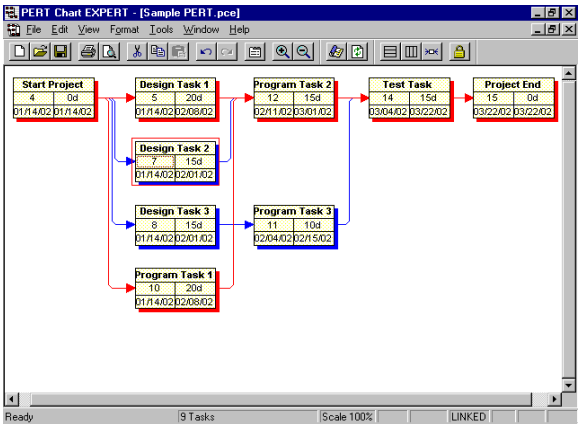

Fig. 3: Sample profile of Microsoft PM Software functionality versus complexity analysis.

4 SWOT analysis of Microsoft PM Software Functionality in kingdom of Bahrain

SWOT analysis is implemented to find out the weak point in the current process and check for the chance of

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enhancement and as analytical tool to analyze the internal and external process of the software complexity & functionality. It includes the strength and weaknesses which represent the internal environment, and the opportunity and the threat for the external part. Implemented SWOT to this research is summarized in Table-2 [11-15].

4.1 Strength (S) Index

Effectiveness and efficiency of PM software usability in Kingdom of Bahrain is measured by equations numbers (1, 2 and 3), the average outcomes is 65% which indicates an acceptable percentage of usability.

Using project management software is capable to automate the project management process, which leads to faster performance then the process can be finished earlier. Saving time is very critical in the project work, because time is money in the project language.
Faster performance becomes useless if the result was wrong, so project management software is intelligent agent that not only processes the activities faster, but also with high-level of accuracy.

Table 2: Summary of SWOT Analysis of PM.

Strength (S)	**Weakness (W)**
1-Effectiveness and efficiency of PM usability measured by equations given in (1, 2 &3) outcomes in range (60-70%) 2-Fast and efficient task time attempted by the users 3-Accurate and reliable project outcomes	1-Complex Functions 2-Not contain all Project management tools. 3-Require knowledge, training and skills in (PM).
Opportunity (O)	**Threat (T)**
1-Develop a new approach to deal with PM process to improve effectiveness. 2-Allow more people to use the PM software. 3-Enhance the process of PM	1-Users will not follow the standard. 2-Neediness of users training may cause project delay.

The project processes are critical, any mistake can cause the project to fail, so it's preferable to have reliable software that can work every time that the user demands it, and to insure that data will be always safe and existent.

4.2 Weakness (W) index

Using project management software is not a simple task; it is not easy to implement the process of project management on it, especially the complex process. It requires training to enhance usability.

PM software may not contain all required project management tools and functions, so many tools do not exist in the current project management software, and even if they are exited they are still not easy to implement. Regarding the required knowledge in project management, if the user does not have the knowledge or at least background of the project management, it will be very hard or even impossible to use it.

4.3 Opportunity (O) Index

To develop a new effective approach to deal with the project management process with the advanced technology where there are possibilities to create new way to deal with project management and make it more effective and efficient process, for example to simplify and automate the process.

More people can use the project management software efficiently by conducting training workshop. Many people are not capable of using project management software because of its complexity, if this complexity is reduced, then more users may use the project management software efficiently. The complexity weakness can be reduced by simplifying the processes.

To enhance the process of project management, it can take the whole advantages of advanced software technology functionality, to accelerate and improve its process, the advanced technology can develop the process and ensure more desirable result and facilitate the project success.

4.4 Threat (T) Index

If the users are not following the standards then current process will not be improved and simplified, then users might skip the standards or fail to meet them, this is due to the complexity weakness.

Due to complexity of the project management software which is not easy to use and require many knowledge and training, then project process that runs on the project management software might become slow, and delay the project itself.

Even if the experts are absent and the other employee doesn't know how to use the project management software, the project's result will be affected.

As a result of SWOT analysis, the PM software has much strength that can make the project management process more powerful, but there are some weaknesses and threats

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as well, but there is still an opportunity to foster and strength usage to overcome both the weakness and threat.

5 Conclusions

Based on the online survey, the responses and outcomes of more than 200 individuals regarding PM software usage are oriented to following research metrics: types, applications, benefits, Convenience, types of chart most frequently used and user's level of knowledge PM software. Most of the users are not satisfied with the current process, they wish if there is a better way to deal with projects, they are using the current project management software for their work and they are convenient with it. However, the study shows that the users wish to have a more powerful, easier way to deal with the project management, where the effectiveness and efficiency of PM usability are measured by equations given in (1, 2 and 3) outcomes in range (60-70%) which is an acceptable range but it needs an improvement in order to enhance usability. Also some users show their interest to use the project management software if it becomes simpler in GUI design. That's why the idea of new software to make the experience of project management process better. The PM software increases user performance and allows the users to interact, manage, plan and control the project works in a systematic way, the project management software users agreed on benefits regarding saving in time & cost, it's like a guide and tool in the same time, it give the user the instruction for every step, also other objective of this research is point out the user's problems that they are facing in using the project management software through conducting SWOT analysis which are

As a final conclusion regarding PM complexity, it is not easy to use the project management software; it requires training and knowledge in order to work on it. Main idea is to reduce PM software complexity usage and to make the experience of using project management software effective, efficient and simpler.

While regarding PM functionality limitation, the current project management software shows lack of some functionality, or it is hard to make some required functions, so there is a need of a system that can offer more functions.

Finally the training needs of PM Software under study require knowledge in project management process. The user cannot use the project management software properly without having a deep knowledge of the project management process; however, if there is a training workshop that can facilitate, support and work with an actual real project, giving guidelines with requirements, it will enhance PM usability.

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