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Project scheduling and role of IT

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Abstract: In the current business environment, companies around the world are conducting their business operations through project implementation. Moreover, project management as a profession is developed by bodies of knowledge and companies are investing in capacity building and in improvement of their internal procedures. Nowadays, different standards are used in a field of project management. However, despite the investment in the field of project management and hundreds of hours of delivered training to project managers, around 60% of the initiated projects in the world are failing and project scheduling is among identified reasons for project failure. Companies that are implementing projects, are using different project management logical frameworks like PMP, PRINCE2 or ITIL[4], however, none of those logical frameworks and guidelines are not providing any suggestion regarding the use of software for project scheduling.

Keywords: MS Project, Schedule. IT, Project Manager

1 MS Project

In order to fulfill business objectives, mission and vision, nowadays companies need to have better scheduling tools, faster calculation and just in time information. For this purpose most of companies rely upon IT [8]. Moreover, “Information technology matters to business success because it directly affects the mechanisms through which they create and capture value to earn a profit” [3].

As a result of implementation of IT in management, the field of project management is also affected from IT innovations and implementation of IT in project management shows that project management is “considered core competence of the organization” [20]. In addition, project-based organization are using project scheduling software in order to schedule, track and report project progress [1], [14], [15], [19], [24], [33], and many companies have resources to develop their own project scheduling software and to adopt existing IT solutions [1]. In addition “Information and communication technology enables the formation of virtual project teams that can operate at different virtual times and geographical locations” [34], while “A manager of an ongoing project has a responsibility to understand how long a project will take to get to its destination and what it will cost” [27].

However, the field of project management is influenced by technological innovations and different project scheduling software is used by project managers. Among the most preferred software for project schedule is MS Project, and this software is consistent with project management philosophy and it is continuously updated.

MS Project is a software that was developed by Microsoft and is among the most used applications for project scheduling. In addition, MS Project can be integrated with MS Project Server and then through PWA (Project Web Access). This way information between project team members and project manager can be shared. “Sharing project information and facilitating a friendly environment for communication are key ingredients in building an atmosphere of collaboration” [31].

The project manager and project team members can collaborate online, which is enabled by using MS Project and MS Project Server which creates virtual project environment, where project team members can share information and complete their task from different physical locations [26]. However, implementation of IT in project management requires investment on training and on software licenses and companies are investing a lot on software and training related to project scheduling [5].

In order to have successful implementation of project scheduling software, companies need to be sure that their staff has basic knowledge of computer skills and good understanding of project management [16]. Knowledge of project management principles is not the issue for project managers, but project managers that are using project scheduling software are not aware of all software features [24].

MS Project provides information regarding the project activities in Gantt Chart view, and the goal of project scheduling is to provide project managers with information regarding the project progress compared to the project baseline. “MS- Project's Gantt chart is a tool to be used for thinking, discovering new and better ways to carry out the work, and for communicating the overall strategy to all involved” [11].

MS Project can display resource over allocation and under allocation and has the capability to create reports in different formats. It can also provide information and calculation based on the inputted data, but the issue remains with human factor, since during the process of updating project tasks, mistakes can occur and in this way project team members can be demotivated [2].

In addition, MS Project is consistent with PMI philosophy [7], and implementation of MS Project could help project managers to track project progress and to see over allocated resources. MS Project focuses on managing programs in the life cycle, which corresponds to the Investment Management (IM) (for program sponsors and managers. Moreover, bridging of MS Project, and MS Access plays an important role on project scheduling and JIT (just in time), [21]. JIT information is valuable for project managers since this information can be used for rescheduling uncompleted project tasks.

MS Project is exclusively targeting project managers [15]; however, decision makers in a company should be aware that during the implementation of project scheduling software, resistance to change may occur. Moreover, companies should be aware of “the importance of involving user in the choice and design of IT systems”

since not all potential users will be able to use the latest scheduling software [12] Project scheduling software's are continuously updated. For example, MS

Project 2007 had introduced new category of resource, the cost resource, while MS Project 2010 had introduced option inactive task. Moreover, MS Project provides the possibility for creating customized fields for task and resources and on those field, project managers can create customized calculation fields. As shown in Figure 1 custom field window of MS Project.



Fig.1 MS Project 2010, Custom Field Window

In MS Project, project manager can create four different task dependencies, like Start to Finish, Start to Start, Finish to Finish and Finish to Start. An example of linking task with MS Project is shown in Figure 2.

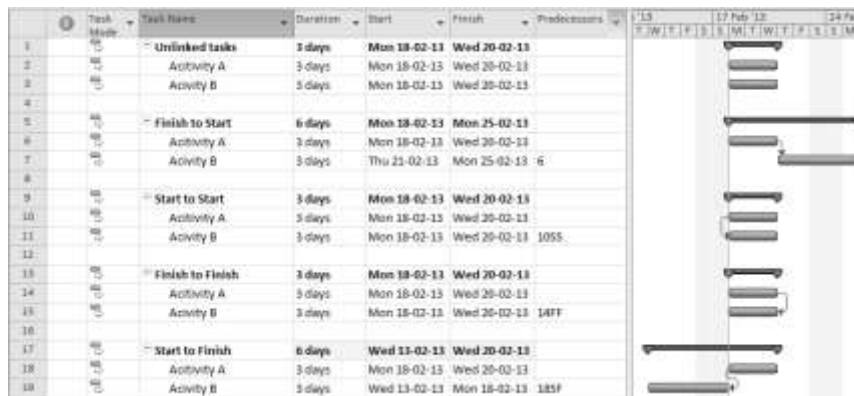


Fig. 2 Task dependencies on MS Project 2010

Moreover, in MS Project, project managers can add different constrain for activates, and those options are shown in Figure 3

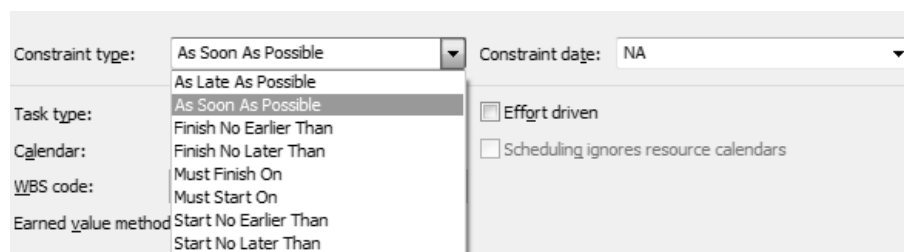


Fig.3 Constrain Type in MS Project

MS Project is user-friendly software, and it offers different information in graphical and in table view. Moreover, MS Project can create reports in MS Excel and MS Visio, and with proper use of those tools, the project manager will have opportunity to create different scenarios and so called what if analyses (Goal Seek, Data Table, Scenario, Solver, Trend Analysis). In addition, results from those analyses can help project managers to re-plan and to reschedule uncompleted tasks for project.

2 Other Project Management Scheduling Electronic Tools

Project managers had started to use project scheduling tools in the last century and among those tools were critical path method, PERT, and Gant Chart; however, as a result of technological innovation, in 1960 and 1970 the first scheduling software was introduced [30]. Moreover, after introduction of GUI (Graphic Users Interface) in 1990, project-scheduling software had become more user-friendly, and with the invention of internet, online collaboration between project manager and project team members was enabled. Moreover, “the nature of ICT innovation demands the fast diffusion of new ideas”, [6].

Nowadays, many companies are offering different project scheduling software, for example single query for project scheduling software in Google had displayed 5.8 million results (Figure 4), and this fact shows that demand for Project scheduling software and solution exists among project managers and project-based companies.



Fig.4, Result for Project Scheduling Software in Google

Technology enables better collaboration between the project manager and the project team, and at the same time, the proper use of technology has a positive impact on project duration. Considering the fact that project success is measured by three constraints: time, quality and cost, [8], [18], [22], [23], it is evident that proper use of IT is playing an important role on project success or failure, since project scheduling software like MS Project can calculate fixed and variable costs for project activities. Moreover, MS Project can display total cost, baseline cost, variance cost, actual cost and remaining cost. Example is shown in Figure 5.

	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
1	Purchasing hardware	\$15,000.00	Prorated	\$15,720.00	\$15,600.00	\$120.00	\$0.00	\$15,720.00

Fig.5, Cost Table in MS Project

Despite information regarding project costs, MS Project can provide information regarding project scheduling and in a same time MS Project will calculate slack. Example of schedule table is shown in Figure 6.

	Task Name	Start	Finish	Late Start	Late Finish	Free Slack	Total Slack
1	Purchasing hardware	Mon 2/25/13	Mon 3/4/13	Mon 2/25/13	Mon 3/4/13	0 days	0 days

Fig.6, Scheduling Table in MS Project

All of this information can be used by project managers to schedule and to reschedule uncompleted project activities while taking into consideration variables such as baseline cost, remaining cost and free slack.

Nowadays, companies have project management tools that enable collaboration [25]. However, possession of tools and skills does not mean that project managers and project team members are willing to use them. Most project management software is designed to conduct project planning and to track progress [10]. However, “More firms are embracing tools that manage scheduling, job cost accounting, estimating, office engineering, and data management, in an effort to measure the course of individual jobs and chart mid-project corrections to achieve project schedule and cost objectives” [13].

Margea and Margea (2011) and Romano (2010) provided lists of project management and collaborative software. Both listed MS Project, however, according to Margea and Margea (2011), MS Project is categorized as a software that does not provide collaboration and document management capabilities, and Table 1 shows their findings.

Table 1, Synthetic comparison of presented Open Source Project Management solutions [15].

Feature	
	Project Portfolio Management

Software	Platform	Web-based	Collaboration	Resource Management	Planning
Collabtive	<input type="checkbox"/>	Windows, Linux, Mac OS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dotProject	<input type="checkbox"/>	Windows, Linux	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
eGroupWare (Version)	<input type="checkbox"/>	Windows, Linux, Mac OS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gant Project	<input type="checkbox"/>	Windows, Linux, Mac OS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open Workbench	<input type="checkbox"/>	Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OpojenProj	<input type="checkbox"/>	Windows, Linux, Mac OS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Redmine	<input type="checkbox"/>	Windows, Linux	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Task Juggler	<input type="checkbox"/>	SuSE Linux	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Microsoft Project	<input type="checkbox"/>	Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MS Project can be used for any kind of project, and it provides coordinated collaboration [25]. Table 2 shows collaboration level of collaborative project management software.

Table 2 Collaboration Level of Collaborative PM Software [25]

Company Name	PM Tool Name	Category of project Collaboration level
Rational.Com	RationalSoda	Software Project Collective
Onproject.Com	Onproject	Business Project Coordinated
Citadon.Com	Projectnet Projectnet.Process	Project of Coordinated Engineering Building and Real Estate
Surdex.Com	CPMS (Collaborative Project Management System)	Photography and MappingServices Communicative
Viecon.Com	Projectbank Projectwise	Engineering Coordinated
Microsoft.Com	Microsoft Project 2000	Any Kind Of Coordinated
Inovie.Com	Team Center 4.5	Any Kind Of Coordinated

However, the process of decision making regarding purchasing project scheduling tools often remains or it is delegated to the IT department. This task is delegated to the IT department, since software is purchased with the IT budget. The IT department also has the responsibility to install and maintain software. However, this way the IT department takes a leading role and is transformed from supporting unit to a strategic unit. The tendency of the human resource department in every company is to hire IT professionals, however, IT professionals have tendency to use latest technology and the latest software. There is a risk that IT department will purchase scheduling software that is difficult for the project managers and project team members to use.

3 Conclusion

Project management is one of the fastest growing disciplines in organizations today [30], and companies are investing in improving project management processes, and for this purpose, “companies

are spending on average \$177,000 per year” [17] However, companies are still facing a large number of failed projects since around 35% of projects are failing [32].

Since 1969 when PMI was established, project management methodology has evolved, and nowadays companies have adopted predefined standards for project management like PMP (Project Management Professional) and PRINCE2 (Projects In controlled Environments), and IPMA (International Project Management Institute in Switzerland). However, none of the Project Management standards recommend any scheduling or planning tool, and planning and scheduling tools are left to the discretion of the project manager. Project scheduling remains among the reasons identified for project failure [10], [13], [23].

As a result of innovation in the field of IT, and also in project management, the latter has been affected, and many companies use different project scheduling software. The most commonly used software for project scheduling is MS Project [14], [15], [19], [24] and [23].

Companies are undertaking projects in order to launch new products, new services, and to improve their business processes. Project initiation is triggered as a result of competition, customer demand and technological innovation. According to PMBOK, “a project is a temporary endeavor undertaken to create a unique product, service, or result, based on a project charter and it has a limited amount of resources” [23]. The academic literature defines project success, according to modern project management and bodies of knowledge, as a project that delivered project products according to a predefined cost, quality and time. [8], [9], [18], [22]. Adaptive Project Management Model, argues that, “According to this model projects are not just a collection of activities that need to be completed on time. Projects are business related processes that must deliver business results” [28], [29].

Role of IT department is shifting from support unit into business strategic and new product development unit. It is time that project management bodies of knowledge evolve their project management curriculum and to include project scheduling software as a part of project management logical frameworks.

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