

Jacek **BULWAN**
Adrian **BRITTANI**

IT SUPPORT FOR PROJECT MANAGEMENT

Abstract. The article describes deployment of an IT tool in OBRUM sp. z o.o. – Microsoft Enterprise Management platform. Previously existing needs for centralized access to project data were named together with the description of new tool's functionalities and supported areas. Finally, benefits of the deployment were pictured compared to the initial situation.

Keywords: EPM, Project Server, project management, IT support for Project Management.

1. PROJECT MANAGEMENT

Organized project management [1] is increasingly present in Polish organizations of various size and nature of activities. The armaments industry is no exception. The problem of orderly pursuance of implementing project goals within the bounds of defined budget, time and other considerations has been known for a long time. It has also been amply described using various methodologies of project management [11],[12],[13],[14]. However, comprehensive tools supporting activities of this type have not found wide use in Polish organizations yet. The IT departments often have no sufficient funds to acquire EPM (Enterprise Project Management) systems. This means that in effect there is insufficient knowledge of the current condition of the organization and of the projects being implemented by it. The consequence is that some operational decisions that are taken are not proper, and long-term, strategic planning is hampered.

The everyday work of project managers and team members often requires undertaking excruciating actions to acquire data necessary to take critical and timely decisions. With professional advanced augmented reality technologies [2],[16],[17] or hundreds of applications for ordinary smartphone users it is a necessity to facilitate the performance of duties by thousands of employees participating in projects across Poland.

The commonly known Microsoft products, Windows and Office among them, also have a specialized product in this area: the Microsoft EPM platform [3],[18]. Based on established products already popular in business circles, such as SQL Server databases and SharePoint communication platform [4], it provides a large number of tools and solutions useful in the world of project management. Moreover, it integrates perfectly with the Office package mentioned before, as well as with other Microsoft products, among them the Office 365 cloud, which is becoming increasingly popular.

EPM supports company management in the area of project planning and monitoring. In addition it enables selecting strategically and economically important projects and provides tools that substantially facilitate flexible planning thereof. It forms a platform for exchanging and accessing information by the project teams. People that monitor progress in project creation are provided with the ability to define clear analyses that enable tracking the current situation in a company.

A decision was taken at OBRUM (the leading company of the Polish armaments industry) to implement EPM in order to ensure high quality of projects and to mitigate the difficulties encountered in comprehensive project management.

2. CURRENT CHALLENGES IN IT SUPPORT FOR PROJECT MANAGEMENT

While project management was adequately defined in appropriate regulations ([6], [7], [8]), until recently there was lack of IT tools for comprehensively supporting business requirements. It should be pointed out that the existence of guidelines of this type has greatly advanced and facilitated analytical work on the system.

Despite there being common rules of conducting projects, the methodology depended heavily on the project manager, and it was hard to find a common approach to project information (documentation, cost data) gathering and classification. This entailed problems with analysis and with presentation thereof.

Plain characteristics of research and development projects conducted by OBRUM show the wide variability thereof, both in terms of their range, as well as cost. The tool chosen should therefore not pin down the project owners in the area of modification, and at the same time it should enable viewing the history of changes taking place during the lifetime of a project. The great variability of the subject matter, managerial and financial project documentation also poses a challenge in terms of information presentation and management. All these data should be quickly and conveniently accessible to designated persons.

Organizing the project management (from concept through launching, implementation and finally recapitulation) also required defining uniform terms or process steps for describing projects. Those performing functions at the various stages have been assigned roles that were associated with the steps for which those people were responsible to clearly determine who should perform their duties at any given time of project management. The adopted methodologies of project management are described in a separate paper [15].

One of the drawbacks when planning work was the lack of a common database that would provide information on workload assigned to individual employees. The managers could not be sure whether an employee they planned to engage in a project is not already involved in other projects. To find this out the employee (and sometimes his or her colleagues or superior) had to be inquired directly. Tens, or even hundreds of such cases occurring during the lifecycle of a project, have burdened the task planners with additional, unproductive and cumbersome, duties.

The time schedules were not uniform and were created using various tools, which precluded its facile transfer and efficient teamwork. A profusion of such problems was encountered particularly when replacement employees were involved and making changes in time schedules caused confusion.

The above complications with project handling accumulated when generating reports: the data came in various systems, formats, and were often not directly available to project managers or the board. Drawing up any single report often required the collaboration of people from many departments. Such activities had to be repeated number of times, in line with the reporting cycle, which required more time for completion. Further consequence of this situation was extended project timeline. It was therefore a high time for introducing mechanisms based on modern information technologies.

Having defined the needs and documented the challenges during the analysis, it was possible to start configuring and adapting the tools to the particular requirements of OBRUM.

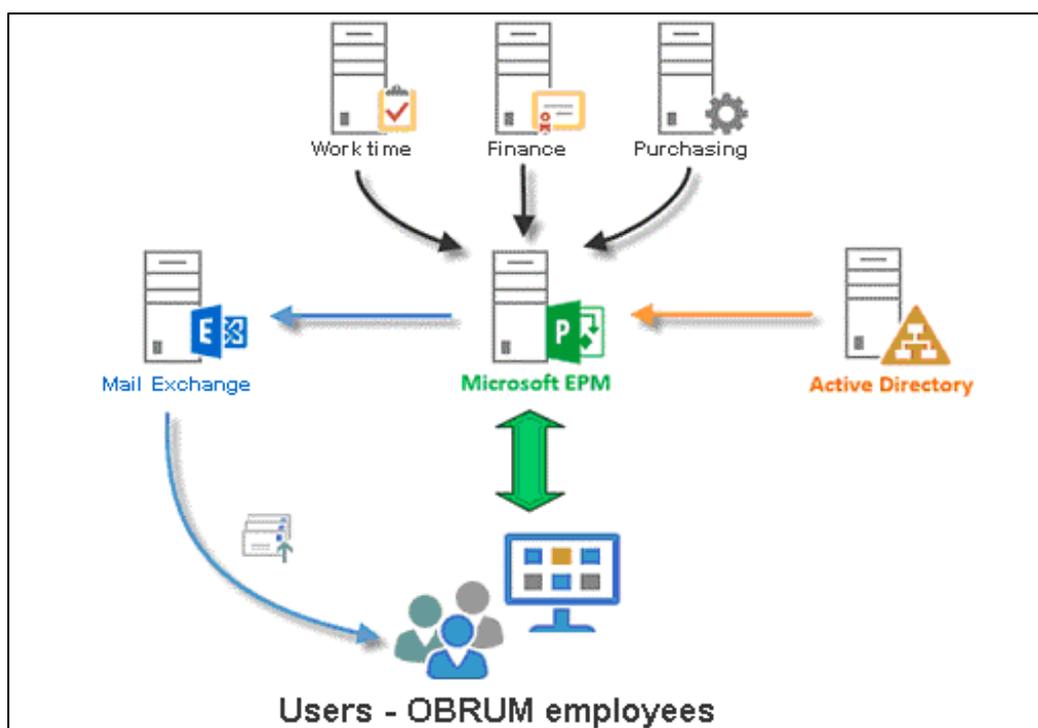


Fig. 1. EPM system environment at OBRUM.

3. RULES AND STRUCTURE OF EPM APPLICATION AT OBRUM

The tools chosen by OBRUM included Project Server [5] and SharePoint platform [4] from Microsoft. This tandem allows customizing to individual needs and at the same time forms a consistent platform of information exchange within the organization. Straight from the box, it also offers a multitude of incorporated functionalities that make everyday work easier. The solution dedicated to OBRUM requirements enabled the integration of the IT system with the applied project management procedures [15]. This arrangement created an IT tool for the project manager which facilitated his or her activities during project execution. The solutions applied at OBRUM are presented below.

3.1. Forms and process

The printed project applications and repetitive contacts with consultants were replaced with electronic forms using standardized glossaries. Automatic sending of e-mail messages supports the tracking of the process and shortens the time of decision making. Documents, if any, required for signing by authorized persons, are automatically generated and printed only after all approvals are obtained. This shortens the decision making process and enables quick review of the history of actions.

The system also automatically verifies requirements before submitting a project to the next steps, so that the subsequent person in the chain has a complete set of data required to take further actions (attached documents, schedule changes, relevant information filled in the project sheet, etc.).

3.2. Project sites

Dedicated project sites are created in order to facilitate communication and provide common digital space for project participants. Navigation is based on a web browser, therefore there is no need to install any additional software. Project sites constitute common space for placing information: documentation, information on project risks or other data (as is the case here) related to project execution (financial, on-time information on the availability of company resources). Access privileges can be tailored to the contents, depending on current needs.

Data from external systems (e.g. financial data) pertaining to the given undertaking are also transferred here. During project execution this is the central site for collaboration within the team, which replaces, or at least supplements the messages, telephone conversations and meetings held before.

The sites can be flexibly modified or expanded with new components. But the initially set up common template of the site is always available for configuring pages of a new project. It is one of the elements that enable consistency of the stored data and at the same time offer the functional elements used at OBRUM.

3.3. Schedules and resources

When planning, the key issue is efficient and flexible scheduling, both in terms of time (task times), as well as resources (employees, outsourced services) assigned to these tasks. This allows planning and monitoring of cashflow required in the project. This is where an advanced schedule editor comes in, which is also well known as a separate application (with no server environment): Microsoft Project Professional 2013. This program, highly popular among project managers, enables modelling project schedules in line with templates adopted by the organization. It is worth mentioning that schedules can be edited by means of a web browser without even using Project Professional.

Potential conflicts and doubts, arising when assigning persons to tasks, can be resolved using centrally defined resources (machines, equipment, rooms and, obviously, employees). This enables acquiring knowledge on the workload assigned to organization resources, and consequently allows avoiding overloading a given resource (assigning more work than that defined by the work time).

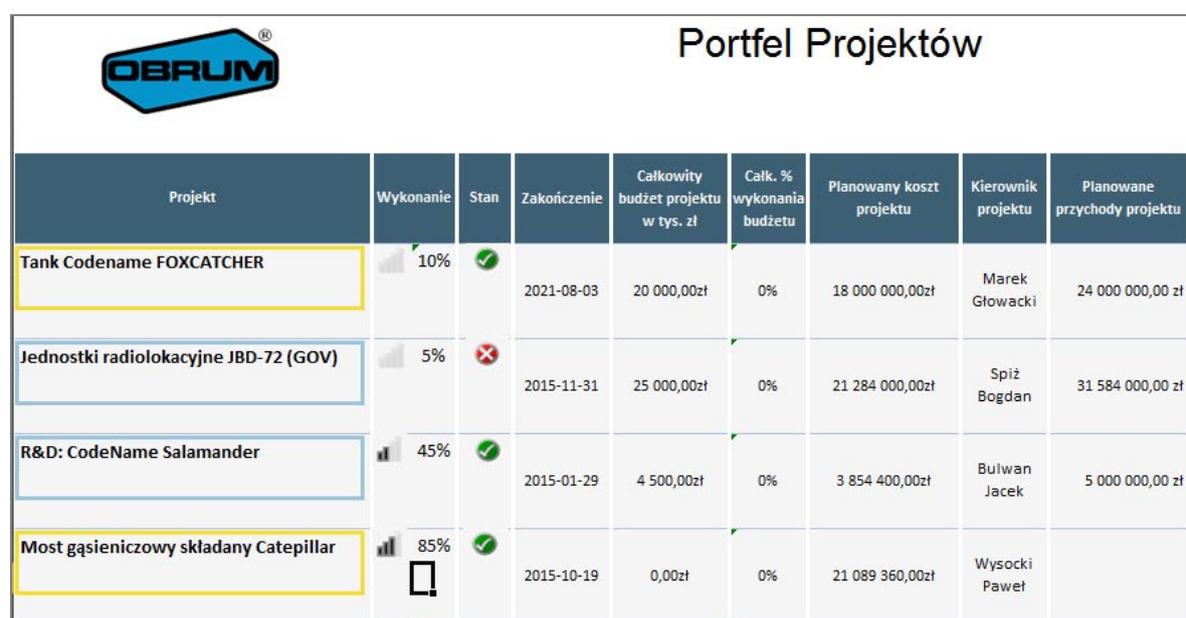
3.4. Integration

Integration of EPM with other IT systems enabled making it a component of the existing system of information circulation. Imported data are transferred to the project sites (or even to schedules) with little input by the project managers. This automation process provides information in an adopted manner (dependent on system architecture), relieving those employees who until now were much involved in report generating tasks. There are a few aspects related to data import:

- project cost (outsourced services, internal cost);
- material cost – often a large portion of running cost of manufacture/prototyping. Integration enables the project manager to verify budget expenses on a running basis from one place;
- hours worked – employees avoid filling in forms in two systems.

3.5. Reports

The result of the above changes was the introduction of a set of modern reports containing data originating both from EPM, as well as from other systems. The formula and manner of distributing reports were designed and unified. Reports are now generated automatically, with only a few mouse clicks. Reports are accessible from mobile devices and can be exported in formats that enable or preclude editing them (PDF, Word, Excel, TIFF). Dashboards and links between reports enable diving deep into project and task details or viewing the entire organization (Fig. 2). Reports enable drawing data from the system using a filter to obtain the information needed.



Projekt	Wykonanie	Stan	Zakończenie	Całkowity budżet projektu w tys. zł	Całk. % wykonania budżetu	Planowany koszt projektu	Kierownik projektu	Planowane przychody projektu
Tank Codename FOXCATCHER	10%	✓	2021-08-03	20 000,00zł	0%	18 000 000,00zł	Marek Głowacki	24 000 000,00 zł
Jednostki radiolokacyjne JBD-72 (GOV)	5%	✗	2015-11-31	25 000,00zł	0%	21 284 000,00zł	Spiż Bogdan	31 584 000,00 zł
R&D: CodeName Salamander	45%	✓	2015-01-29	4 500,00zł	0%	3 854 400,00zł	Bulwan Jacek	5 000 000,00 zł
Most gąsienicowy składany Catepillar	85%	✓	2015-10-19	0,00zł	0%	21 089 360,00zł	Wysocki Paweł	

Fig. 2. An example of a project portfolio report

5. BENEFITS ARISING FROM THE IMPLEMENTATION OF EPM

The process of implementing the system can be divided into several stages, each of them lasting two to three months: analysis with prototyping (to better demonstrate the final product), implementation, testing, training [9], [10] installation and stabilizing the implemented system (making necessary corrections to any flaws observed during system operation). Good collaboration between teams played a key role in the process. Thanks to the commitment of both parties, the final product was adapted to the systems (including accountancy, materials management) existing at OBRUM. During the implementation process, in order to minimize project risks, project management meetings were held each month to present and approve prototypes of implemented functionalities. These actions eventually led to the creation of the final version of the software.

By working together with the OBRUM team (established to implement the project), which included employees of the various departments, a tool has been made available that provided the employees with new opportunities for organizing the environment [10] for managing

leading projects within the Polish armaments industry. While the recently implemented system is being used, modifications thereto are being made based on projects conducted at OBRUM. The major benefits already achieved include:

- centralized management – one consistent environment for managing projects and related data for the Board, Project Managers and employees;
- standardization – uniform nomenclature, process, tools and reports for many undertakings;
- fast data flow – electronic notification and approvals and integration, combined with the report engine, substantially improve the comfort, speed and mode of project data acquisition;
- development opportunities – implementation of EPM, and of SharePoint in particular, opens many possibilities of expanding digital support for the employees;
- flexibility – the choice of a popular tool of renowned brand warrants its further development.

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