Politechnika Wrocławska

SOFTWARE PROJECT IN MANAGEMENT

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Criteria for the selection of methods and tools of project management

PROJECT MANAGEMENT

- IT project management is an important part of project management and is most often identified with the analysis and design of IT systems and the so-called software engineering.

- The widest category - from a theoretical point of view - is project management identified with a specific scientific field, based on theoretical solutions to practical problems resulting from "the need to meet the client's analyzed requirements using available skills, knowledge, methods, techniques and implementation tools" (Mingus 2009, p. 21).

TYPES OF METHODS

- **classic, traditional methods**
  - cascade (linear),
  - incremental,
  - evolutionary,
  - databases,
  - prototype,
  - spiral.
- **modern, agile methods**
  - XP (eXtreme Programming),
  - Scrum,
  - Feature Driven Development (FDD),
  - Dynamic System Development Method (DSDM)
  - Adaptive Software Development (ASD)

METHODOLOGY SELECTION CRITERIA

- There is no universal methodology for all cases.
- Methodologies are only a set of patterns, rules and formulas that help to avoid mistakes, but do not completely remove them.
- Consistently implemented methodology gives you a sense of control over the project, maintaining the full commitment of all participants and a sense of security justifies the implementation of the business strategy sponsor.

METHODOLOGY SELECTION CRITERIA

This selection defines a number of factors related to the specific project,

e.g. its size,
the industry in which it is implemented,
human factor in the project,
additional implementation requirements, etc.).

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **Type and schedule of financing the work included in the contract with the client**
  - if it is assumed exponential, it should be agile methodologies.
  - if the logarithmic function of budget implementation is assumed - especially for companies with an established market position - it pays to adopt one of the classical methodologies.

- **Budget Type**
  - Project budget unevenly spread over time, forcing different work intensity and high level of uncertainty, indicates more efficient use of agile methodology.
  - The budget financing the project in an even and constant manner suggests using the classical methodology.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **The nature of the schedule arrangements**
  - The imposed rigid time assumptions in relation to the planned tasks speak in favor of using classical methodologies.
  - Approximate or relative deadlines suggest using agile methods.

- **The amount and level of documentation required and the level of software quality**
  - Compliance with complex requirements related to formal documentation, licenses and certification standards indicates the need for a classic project management methodology.
  - The project, in which the emphasis is on software quality and development opportunities, is in line with the philosophy of agile methodologies.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **The approach to project risk**
  - low design risk better support agile methodologies.
  - high risk in the project forces the use of classic methodologies, which assume the creation of risk minimization plans or emergency situations.

- **Communication with the customer**
  - agile methodologies assume continuous and direct communication with the client. Therefore, all factors related to misunderstanding of implemented tasks are reduced.
  - in classical methodologies, rarer contact with the customer is preferred, which often leads to confusion at the time of presentation and transfer of the completed system.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **Organizational structure necessary to implement the project**
  - enterprises with a hierarchical or related structure, including strictly specialized units in their structures, will prefer classical methodologies.
  - enterprises with a matrix, project or other structure, in which they can afford to delegate project tasks to smaller teams, in which there is no strictly defined organizational hierarchy, should choose the classical methodology.

- **Sector / Industry**
  - industries that are at the entrance of a small number of raw materials and the output of finished products, are better suited for use classical methods.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **Project size**
  - Some programming environments related to the implementation of large systems believe that classical methods are better suited to the implementation of this type of projects. In agile methodologies (especially Scrum) it is difficult to coordinate the activities of many small groups implementing the large projects, even repetitive ones.

- **The type of system for which the project is implemented**
  - Expert or knowledge-based systems often require extensive knowledge of the implemented issue. If these systems are designed to be self-learning, it is recommended to use modern methodologies, otherwise - for systems based on established practices classical methodologies is preferred.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO CHMIELARZ

- **Psychological factors**
  - e.g. experience of the implementation of the team in the use of agile or classic methodologies, the trust of the organization in which the project is implemented to the project team, a high degree of use in teams of mixed specialists from the future user, etc.

METHODOLOGY SELECTION CRITERIA

ACCORDING TO KRUPA

- Criterion 1 - Knowledge of the solution
- Criterion 2 - Project size
- Criterion 3 - Stability of requirements
- Criterion 4 - Customer availability
- Criterion 5 - Tolerance for changes in budget and scope
- Criterion 6 - Delivery time
- Criterion 7 - Team
- Criterion 8 - Integration with external systems
- Criterion 9 - Customer preferences

METHODOLOGY SELECTION CRITERIA

ACCORDING TO ORŁOWSKI, ZIÓŁKOWSKI

- Organization and / or team maturity
- Maturity of the client and his organization
- Entropy of the project

PROJECT MANAGEMENT

METHODOLOGY SELECTION CRITERIA

- The list of factors is neither complete nor sufficient.
- It is very difficult to assess ex-ante which of the known methodologies in the presented system is the best for the implemented project.
- Many organizations that make a living by implementation of project are interested in project management, consisting in practice (simplifying the situation) mainly in parallel management and evaluation of as many projects as possible.

PROJECT MANAGEMENT

METHODOLOGY SELECTION CRITERIA

- Project management is a style of management that improves entrepreneurship and is a kind of "golden mean" between the real needs of the client's company (determined by its specificity) and knowledge (theoretical and practical) and project management methods (Stabryła 2006).

- This pragmatics of approach makes it possible to create best practices during the implementation of individual types of projects, which facilitates the creation of strategies not only for organizations that keep up with the creation and implementation of projects (and increasingly - not just IT ones) and, in the end, the choice of project management methodologies.

FEATURES OF PROJECT MANAGEMENT TOOLS

- Eliminating the barrier in the form of large bureaucratic procedures
- Free access enabling communication between project participants in real time
- Ability to enter task names and their descriptions - the tool should provide at least two levels of tasks to allow a summary of the plan implementation
- The ability to create dependencies between tasks
- Determining the duration of project tasks,
- Specifying start and end dates for tasks - each project is implemented within certain time limits (this function allows you to save these restrictions),
- Determining 'milestones'
- Allocation of funds for carrying out tasks

FEATURES OF PROJECT MANAGEMENT TOOLS

- Indication of the use of resources and resources
- Output schedule
- Determination of the critical path
- Place to note progress in implementation
- Automatically modify the project schedule taking into account progress
- The program should give the opportunity to view the project plan from several perspectives, e.g. Gantt diagrams
- The program should include functions that facilitate change management,
- The ability to transfer files

THE BENEFITS OF USING PROJECT MANAGEMENT SOFTWARE

- Very good work organization
- Excellent information flow; every participant is always up to date at every stage of the project
- Well-organized division of duties
- Easier control by the project manager
- Register of possible risks
- Facilitated communication
- Clarity
- Facilitated control of funds allocated to the implementation of a specific task