



Politechnika Wroclawska

**SOFTWARE PROJECT IN MANAGEMENT**

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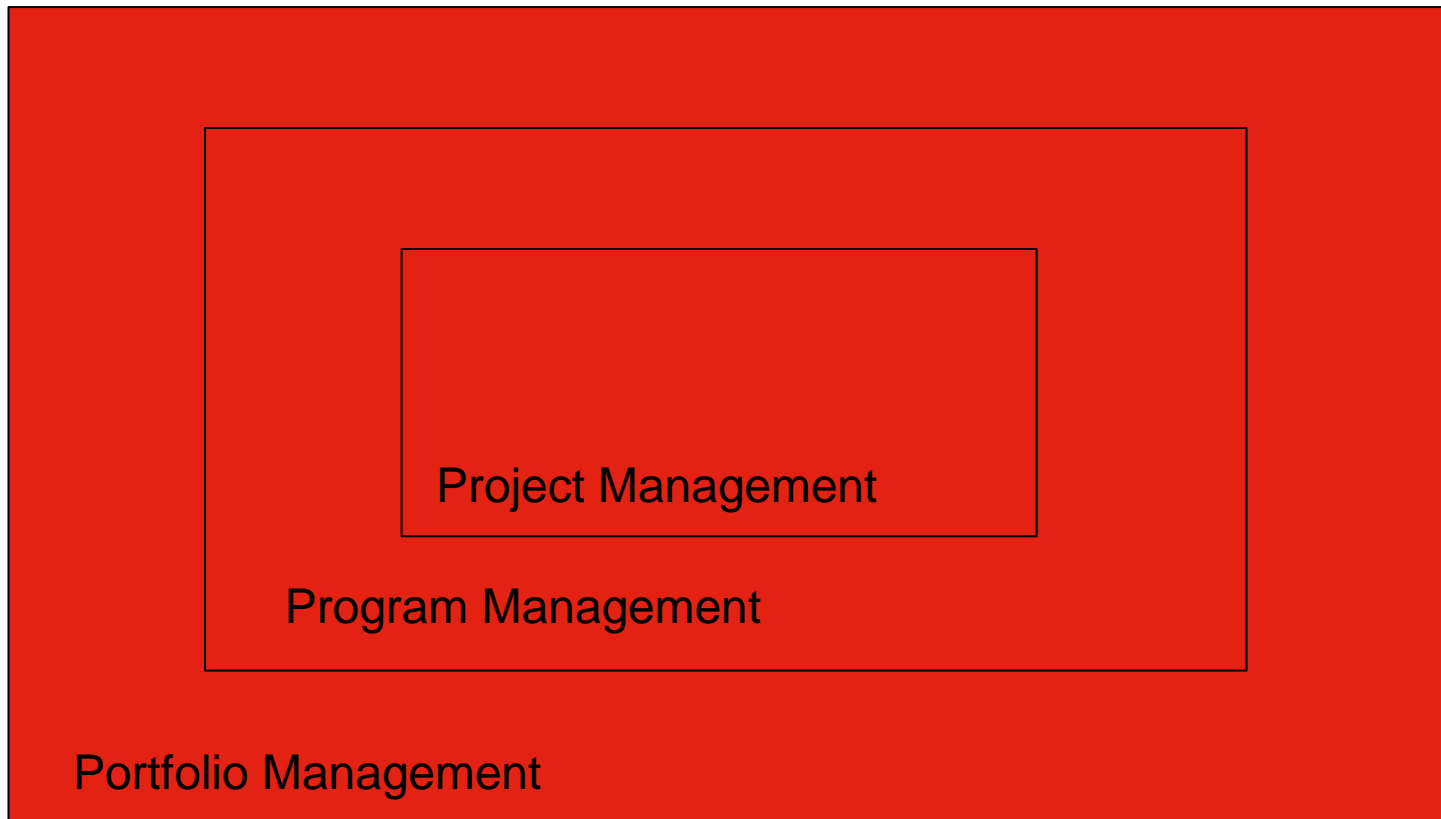
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# PORTFOLIO / PROGRAM / PROJECT MANAGEMENT



# PROJECT / PROGRAM / PORTFOLIO MANAGEMENT





# PROJECT MANAGEMENT

- **A project** is a temporary endeavor undertaken to create a unique product, service or result.
- **Example:** project to set up a call center for a company to provide support service to customers. You start the project, set up the call center, and hand it over to your client. Now your client is ready to provide support service to their customers.
- **Project management** is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.



# PROGRAM MANAGEMENT

- **A program** is a group of related or similar projects managed in a coordinated way to get the benefits and control not available from managing them individually.
- **Example:** you have two projects: the first project is to construct a school building and the second project is to construct an office building. Since these two projects are similar, you will keep them under a program
- **Program management** is defined as the centralized, coordinated management of a program to achieve its strategic objectives.



# PORTFOLIO MANAGEMENT

- **Portfolio** refers to a group of related or non-related projects or programs. A portfolio can consist of multiple programs or multiple projects without having a single program.
- **Example:** assuming, you have three projects: the first project is to construct a building, the second project is to conduct research to find the impact of motor pollution on the environment, and the third project is to set up a call center.
- **Portfolio management** has a bigger scope and objective than program management.



# A SUMMARY OF KEY CONCEPTS

**Table 1. Projects, programs and portfolios**

	<b>Projects</b>	<b>Programs</b>	<b>Portfolios</b>
Scope	Projects have defined objectives. Scope is progressively elaborated throughout the project life cycle.	The programs have a larger scope and provide more significant benefits.	Portfolios have a business scope that changes with the strategic goals of the organization.
Change	Project managers expect change and implement processes to keep change managed nad controlled.	The program manager must expect change from both inside and outside the program and be prepared to manage it.	Portfolio managers continually monitor changes in a broad environment.
Planning	Project managers progressively elaborate high-level information into detailed plans throughout the project life cycle.	Program managers develop the overall program plan to create high-level to guide detailed planning at the component level.	Portfolio managers create and maintain necessary processes and communications relative to the aggregate portfolio.
Management	Project managers manage the project team to meet project objectives.	Program managers manage program staff and project managers; they provide vision and overall leadership.	Portfolio managers may manage or coordinate the portfolio management staff.
Success	Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction.	Success is measured by the degree to which the program satisfies the needs and benefits for which it was undertaken.	Success is measured in terms of aggregate performance of portfolio components.
Monitoring	Project managers monitor and control the work of producing the products, services or results that the project was undertaken to produce.	Program managers monitor the progress of program components to ensure the overall goals, schedules, budget, and benefits of program will be met.	Portfolio managers monitor aggregate performance and value indicators.



# PORTFOLIO MANAGEMENT

- the process of analyzing and allocating organization resources between projects and programs to achieve the organization's goals and maximize value for stakeholders,
- is a dynamic decision-making process during which a set of active projects (or programs) is constantly verified and updated [Martinsuo and Lehtonen 2007, p. 56],
- makes it possible to make decisions determining the combination of projects to be directed for implementation, as well as the level of funding for each project under the portfolio.





# FEATURES OF PORTFOLIO MANAGEMENT

- a systemic approach to projects and organizations,
- project perception as a means of implementing the strategy and achieving strategic goals,
- the need to coordinate many business ventures implemented simultaneously.



# PORTFOLIO MANAGEMENT

Table 2. Project portfolio management process

PMI	J. Stawicki	N. Archer, F. Ghasemzadeh	R. Wysocki, R. McGary
<ol style="list-style-type: none"> <li>1. Identification</li> <li>2. Categorization</li> <li>3. Evaluation</li> <li>4. Selection</li> <li>5. Prioritization</li> <li>6. Balancing the portfolio</li> <li>7. Authorization</li> <li>8. Periodic portfolio review and reporting</li> <li>9. Strategic change</li> </ol>	<ol style="list-style-type: none"> <li>1. Strategic preparation (strategic goals and strategy assumptions of the portfolio)</li> <li>2. Portfolio construction (evaluation, selection, approval)</li> <li>3. Portfolio management (portfolio monitoring and verification, project scheduling, resource distribution)</li> </ol>	<p>Initial phase:</p> <ol style="list-style-type: none"> <li>1. Selection of project assessment methodology</li> <li>2. Analysis of the company's strategy and its limitations</li> </ol> <p>The main phase:</p> <ol style="list-style-type: none"> <li>1. Initial verification</li> <li>2. Analysis of a specific project</li> <li>3. Verification (elimination of projects)</li> <li>4. Choosing the optimal portfolio</li> <li>5. Portfolio adjustment</li> </ol>	<ol style="list-style-type: none"> <li>1. Creating (portfolio strategy)</li> <li>2. Evaluation (projects on admission to the portfolio)</li> <li>3. Hierarchization (projects in the portfolio)</li> <li>4. Selection (projects for portfolio balancing)</li> <li>5. Management of active projects</li> </ol>



# PROJECT PORTFOLIO MANAGEMENT PROCESS

- A set of conditions for effective PMP [Kerzner 2005]:
  - not skipping any stage of the proceedings,
  - conducting process steps in the right order,
  - taking into account the weight of all stages,
  - ordering the entire process,
  - repeatability and continuity of the process,
  - strongly emphasized the need to constantly adapt the project portfolio to changes in the company's strategy.
- Selection and hierarchy of portfolio projects
- The steps of PMP [Brzozowski, 2014]::
  - Identification of portfolio projects.
  - Evaluation, selection and hierarchy of portfolio projects.
  - Balancing the project portfolio.
  - Implementation and control of active portfolio projects.



# PROJECT PORTFOLIO MANAGEMENT METHODS

- Methods for identifying portfolio projects
- Methods for assessing, selecting and hierarchizing projects in the portfolio
- Portfolio balancing methods
- Methods for implementing and controlling active portfolio projects



# METHODS FOR IDENTIFYING PORTFOLIO PROJECTS

- Identifying and proposing projects to the portfolio is closely linked with the operation of the strategic planning process.
- Projects should be reported to the portfolio as a consequence of analyzes (both the environment and the interior of the organization) and conceptual activities.
- The goal of this stage of project portfolio management is to create a list of currently implemented and potential elements of the portfolio.



# METHODS FOR IDENTIFYING PORTFOLIO PROJECTS

- Heuristic (expert) methods. A group of organizational methods based on intuition and subjective assessment, opinions and experiences expressed (generating innovative ideas for business ventures).
- Strategic compliance method. It assumes that the portfolio project proposals directly result from the adopted strategic goals and previously developed company strategies (development, competition, functional).
- Project distribution matrix. The assumption is to facilitate the completion of the recommended set of project portfolio covering all organizational levels and showing the diverse nature of the project.



# THE MATRIX DISTRIBUTION PROJECTS

**Table 3. The matrix distribution projects**

<b>Organizational level</b>	<b>The nature of the project</b>		
	<b>innovation</b>	<b>improvement</b>	<b>maintenance</b>
Strategical			
Tactical			
Operational			

Source: [Wysocki i McGary 2005, s. 425].



# **METHODS FOR ASSESSING, SELECTING AND HIERARCHIZING PROJECTS IN THE PORTFOLIO**

- Gathering information and comparing potential portfolio components to create a set (ranking) of categorized and evaluated projects for implementation.
- The starting point is to categorize potential portfolio projects according to various criteria, including project life cycle stages, degree of innovation, degree of necessity / urgency, and degree of linkage and consistency with other organization's projects.





# METHODS FOR ASSESSING, SELECTING AND HIERARCHIZING PROJECTS IN THE PORTFOLIO

**Table 4. Portfolio valuation by ranking factors**

Project	Criterion (partial rankings)					Total	Place in the hierarchy
	1	2	3	4	5		
1							
2							
...							
N							

Source: [Wysocki i McGary 2005].



# METHODS FOR ASSESSING, SELECTING AND HIERARCHIZING PROJECTS IN THE PORTFOLIO

**Table 5. Portfolio valuation by pair comparison**

Project	1	2	...	N	Total	Place in the hierarchy
1	x					
2		x				
...			x			
N				x		

Difficult project - 2; similar level of difficulty - 1; easy project- 0.

Source : [Wysocki i McGary 2005].



# **METHODS FOR ASSESSING, SELECTING AND HIERARCHIZING PROJECTS IN THE PORTFOLIO**

- **Methods of assessment of the financial profitability of projects**

The methods in this group allow selection and hierarchization of projects based on the value created for owners.

The most popular methods among this group include methods based on the gauges of financial evaluation of projects (eg. NPV) and methods based on measures of shareholder value (eg. EVA).



# NET PRESENT VALUE (NPV)

$$NPV = \sum_{i=1}^n \frac{CF_i}{(1+r)^n} - I_0$$

$$NPV = \sum_{i=0}^n \frac{CF_i}{(1+r)^n}$$

- Assumption: constant level of discount rate  $r$
- $CF_i$  - net cash flows
- $n$  - number of periods
- $r$  - discount rate
- $I_0$  - value of the initial investment



# **METHODS OF BALANCING THE PORTFOLIO**

- develop such a configuration of the portfolio that the company's strategic goals will achieve to the greatest extent,
- support the organization's ability to allocate resources (financial, property, information, human resources) in compliance with its strategic development,
- the goal is to maximize the value created by the portfolio components within the acceptable risk level.

# METHODS OF BALANCING THE PORTFOLIO

- **Matrix of projects compliance with the strategy**

Table 6. Matrix of projects compliance with the strategy

Project	Strategic Priorities				Project weight
	1	2	...	N	
1	x				
2		x			
...			x		
N				x	

Relationship between the project and the priority: 2 - high compatibility, 1 - medium compatibility, 0 - low compatibility.

# METHODS OF BALANCING THE PORTFOLIO

- **Risk-benefit matrix**

Table 7. Risk-benefit matrix

Project	Probability of project success (in economic terms)					
The probability of technical success		1	2	3	4	5
	1	X	X	X		0
	2	X	X	X		0
	3	X	X		0	0
	4			0	0	0
	5	0	0	0	0	0

1 = high, 5 = low;

× - recommendation for financing the project;

no symbol - funds allocated for detailed consideration;







0 – no recommendation for financing the project.

Source: [Wysocki and McGary 2005, p. 435].

# METHODS OF BALANCING THE PORTFOLIO

- **Matrix methods for analysis and visualization portfolio**

Table 8. Matrix methods for analysis and visualization portfolio

Quality of resources needed (knowledge of the industry, human potential, technology, knowledge, reputation, relationships, funds)				
High	Medium	Low		
H 	H 	M	High	<b>Benefits of project implementation (profitability, customer satisfaction, development, transfer of know-how, use of resources)</b>
H 	M 	L 	Medium	
M	L 	L	Low	

W - high priority projects; S - medium priority of projects, N - low priority of projects.

Source: [Kerzner 2005, p. 220].





# METHODS FOR IMPLEMENTING AND CONTROLLING ACTIVE PORTFOLIO PROJECTS

- In the area of application of this group of methods, well-known management standards for individual projects are used (e.g. PMBoK, Prince2, Scrum).
- A specific challenge for project portfolio management is to assess the relationship between the quality of individual project management and the quality of portfolio management as a whole.



# METHODS FOR IMPLEMENTING AND CONTROLLING ACTIVE PORTFOLIO PROJECTS

- **The method of covering portfolio projects with human resources**

Table 7. The method of covering portfolio projects with human resources.

Position	Number of employees available	Number of employees needed in the project			
		Project 1	Project 2	...	Project N
1					
2					
...					
N					

Source: [Wysocki i McGary 2005, s. 444].



# **METHODS FOR IMPLEMENTING AND CONTROLLING ACTIVE PORTFOLIO PROJECTS**

- Schedule implementation indicator
- Cost implementation indicator
- The method of multi-criteria decision analysis



# PROJECT PORTFOLIO MANAGEMENT METHODS

Table 8. Project portfolio management methods

Project portfolio management stage	Methods	Type of method		The origin of the method					
		I	J	SM	PM	HRM	OM	M	F
Project identification portfolio	heuristic methods		X				X		
	strategic compliance method		X	X					
	matrix distribution projects		X		X				
Methods for assessing, selecting and hierarchizing projects in the portfolio	portfolio valuation by rank factors	X	X			X	X		
	portfolio valuation by pair comparison		X			X	X		
	methods of assessment of financial profitability of the projects portfolio	X							X
Balancing the project portfolio	matrix of compliance of projects with the strategy		X	X					
	benefit-risk matrix		X	X	X				
	matrix methods for analysis and visualization portfolio	X	X	X				X	
Methods for implementing and controlling active portfolio projects	human factor project coverage matrix	X	X		X	X			
	schedule implementation indicator	X	X		X		X		
	cost performance index	X							X
	method of multi-criteria decision analysis	X	X	X			X		

SM - strategic management; PM - project management; MRM - human resources management; OM - organizational methods; M - marketing, F - finance, J - qualitative, I - quantitative.

Source: [Brzozowski, 2014].