

PROJECT MANAGEMENT MATURITY ASSESSMENT OF THE SME SECTOR ENTERPRISES – RESULTS OF OWN RESEARCH

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Purpose: The purpose of this study was to assess the project management level of small and midsize enterprises cooperating with the Częstochowa University of Technology, considering the key factors determining the level of maturity.

Design/methodology/approach: A quantitative method was applied using a survey questionnaire on the interankiety.pl platform. Project maturity was assessed using the following models: the level of maturity of the organization in project management proposed by S. Spalek and the H Kerzner's Project Management Maturity Model.

Findings: The research showed that the percentages of enterprises with the lowest and highest project maturity are at similar levels. The most important factor for project maturity level is systemic project management. The enterprises must meet the basic conditions in the area of project management methods and tools. Overall, a higher level of maturity was noted in the field of human resources and the lowest in the area of project knowledge management.

Originality/value: The study fills the research gap on project management maturity assessment in the sector of small and medium-sized enterprises commercializing scientific research results. It also identifies key project management maturity factors. Project maturity will play an increasingly important role in the field of project management. Thus, the need will arise to distinguish oneself from competitors, to compare oneself with others in terms of project implementation capacities. The research indicated that the model proposed by S. Spalek is characterized by simplicity and flexibility of application.

Keywords: project, project management, project maturity, maturity model.

Category of the paper: research paper.

1. Introduction

Project management is a method of management focused on the effective achievement of the project objective, within the specified time and budget, while neutralizing the impact of existing constraints and minimizing risks. It is also deals with fostering the motivation of the project team and proper communication between project participants (PMI, 2012).

The scope of application of project management in Polish enterprises is steadily growing. It can be concluded that the more mature the project management process, the more it is appreciated by the enterprises (Spalek, 2013). There are many benefits of implementing the project management method into enterprise practice. Among the primary ones is the positive impact of this method on the technical and organizational progress of the enterprise. They result, *inter alia*, from the possibility of combining project management with other management systems, such as concurrent design, comprehensive quality management, risk management or change management. Combining project management with other systems provides many opportunities (Pritchard, 2002), including shortening time for development of new products, extended average product life cycle, increased sales, increased revenue, increased customer base, fewer changes to technical documentation, reduced time to market for new product, higher customer satisfaction rate, better procedures for identifying risk factors, more effective response processes, increased ability to respond quickly to customer requests for change (Wójcik, 2015, p. 530). Moreover, the enterprise can take more of its own actions to increase the value offered to customers by which it will establish a good relationship with customers, which in turn will result in customer satisfaction.

Thus the increase in the number of projects carried out in enterprises is quite understandable (Fricke, Shenhar, 2000, pp. 258-268). The resulting multi-project environments began to cause new, previously unknown problems (Canonico, Soderlund, 2010, pp 796-806). The need for sharing resources, *inter alia*, has intensified (Chen, Lee, 2007, pp 202-217) as well as the issue of projects prioritization (Fricke, Shenhar, 2000, pp 258-268; Spalek, Bodych, 2011). The ability to manage knowledge has become an extremely important issue (Friesl et al., 2011, pp. 71-86; Kowalczyk, Nogalski, 2007; Liebowitz et al., 2007, pp. 1123-1153; Paliszkiwicz, 2007, pp. 825-836) – particularly concerning its effective use in subsequent projects (Holzmann, 2013, pp. 2-13; Mueller, 2012, pp. 435-447; Phusavat et al., 2008, pp 513-528; Wyrozębski, 2011). In an effort aimed at systematising knowledge in this area, Gasik (2011, pp. 23-44) presented an integrated project knowledge management model which could be effectively used in organizations. There also appeared first research works on the use of project knowledge management in practice (Cho, Hastak, 2013, p. 90, 101; Hsu et al., 2007, pp. 30-51; Li, Bai, 2011; Lindner, Wald, 2011, pp 877-888; Wyrozębski et al., 2012).

The aforementioned considerations allow us to formulate a general conclusion that modern project management should revolve around four main areas (Spalek, 2013):

- methods and tools applied in project management,
- human resources in project management,
- project knowledge management.

The growing popularity of project management in business practice and in the evaluation of this management method justify the assessment of the maturity of enterprises in this area. Project management maturity assessment is not just a “picture of the skills” an organization has in the area in question. According to Nowosielski (2012) this assessment method should be

used to improve the company's operations. The purpose of the presented study was to evaluate the level of project maturity of small and midsized enterprises cooperating with Częstochowa University of Technology, considering the key factors influencing their management maturity level.

2. Project management maturity of enterprises

Project management maturity is the ability of an organization to effectively select a portfolio of projects so that the implementation of these undertakings supports the organization's goals and strategy, and its ability to apply professional project management techniques and tools to achieve high quality project products, enabling repeatable successes and to avoid mistakes in subsequent projects (Juchniewicz, 2009a).

Thus, the logic of project management maturity is as follows: as project management maturity increases, i.e., as successive levels of maturity are reached, the organization's effectiveness in implementing projects increases, resources are used more efficiently, project experiences from previous projects, both successes and failures, are used in subsequent projects.

The project management maturity of an organization should be considered from two perspectives. Firstly, project management maturity models are diagnostic tools. They enable a comprehensive analysis of the state (level of organizational skill) of project management capacity of an organization. Secondly, project management maturity testing is not a one-off activity. The logic of project management maturity suggests implementing a philosophy of continuous improvement of project management in the organization, i.e. striving to achieve ever higher levels of maturity (Juchniewicz, 2009b).

Measurement of the organization's project management maturity is conducted using special tools, the so-called Project Management Maturity Models. They make it possible to determine in a precise way which project management processes are carried out in the organization and at what skill level they are implemented, and on this basis assign the organization to a given (strictly defined) level of project management maturity.

Project management maturity models appeared in management theory and practice in the early 1990s. For the most part, their design is based on the so-called Quality Management Maturity Grid - the first-ever model for assessing an organization's maturity (in this case, in quality management), proposed by Phillip Crosby, an American quality management specialist. The management maturity grid defines five levels of skill in an organization concerning quality management. Achieving each level requires conducting a certain well-defined processes or activities (Crosby, 1980).

The first model to measure project management maturity of an organization was developed by the Software Engineering Institute (SEI). In 1991, a document called the Capability Maturity Model (CMM) was published. This tool, initially applicable to the IT industry, was quickly recognized and appreciated by organizations in other sectors (Saemu, Prompoon, 2004, pp. 158-165).

Another tool is the Capability Maturity Model Integration (CMMI), which differentiates 22 process areas, clearly defined and named (Juchniewicz, 2009a). This model proposes two approaches to assessing an organization's maturity - continuous and graded. The continuous approach assumes that each process area is evaluated separately. On the basis of specific procedures, it is determined how a process area is implemented, and then one of six maturity levels is assigned to it (from 0 – incomplete to 5 – optimizing). In a graded approach, the entire organization is assessed. In this case, CMMI defines five levels of maturity (from 1 – initial to 5 – optimizing) (Saemu, Prompoon, 2004, pp. 158-165).

One of the most important model from the point of view of applicability is the one proposed by H. Kerzner (2001) – The Kerzner Project Management Maturity Model (PMMM). Its significant advantage is the simplicity of its design and related to it ease of the maturity assessment process. Moreover, the tool is freely available and free of charge, making it suitable for use by any organization, regardless of its size, revenue or nature of operations. The model consists of five maturity levels. At level 1, an organization may have some knowledge of project management and may be able to differentiate projects from the ongoing operations, or it may have no such knowledge at all. At level 2, the organization recognizes the processes involved in project management. In addition, these processes are common to all projects in the organization, which makes it possible to replicate the success of one project in another. At level 3, the organization recognizes the benefits from the synergy of process and their control, and develops a unified methodology, replacing individual tools and techniques. At level 4, the organization uses a uniform methodology, while being aware of opportunities to improve it based on the experiences of the best organizations around. At level 5, the organization effectively uses the knowledge gained from benchmarking and is itself a role model.

One of the more popular and at the same time more important project maturity models is the Organizational Project Management Maturity Model (OPM3) which has been developed by the Project Management Institute (PMI), the world's largest organization of project managers. The model was constructed on the basis of so-called Best Practices (BPs). It distinguishes 586 BPs. Each practice is assigned to dimensions which are based on four phases of process management (standardization, measurement, control, continuous enhancement) and three areas of project management (projects, programs, portfolios). Project maturity assessment with OPM3 is carried out using a special computer program (Juchniewicz, 2009a).

Based on the literature studies, it can be concluded that project management maturity is most often assessed in the areas of methods and tools, human resources and organizational context (project environment). S. Spalek (2013) proposes a model that includes the aforementioned areas and supplements them with knowledge management processes within each area. This model differentiates five levels of maturity in project management (Table 1).

Table 1.

Organization maturity in project management model

Maturity level	Main characteristics of the project management approach
L5. Self-improvement	<ul style="list-style-type: none"> • Implementing improvements in relation to PM methods and tools • implementing ameliorations and improving project team management • systematic improvement of management processes supporting PM • implementing improvements in systemic project knowledge management
L4. System Management	<ul style="list-style-type: none"> • application of standard PM methods and tools in all projects • application of project team management standards in all projects • comprehensive support of PM by the management/organizational system • application of project knowledge management standards in all projects
L3. Application	<ul style="list-style-type: none"> • application of standard PM methods and tools in most projects • application of project team management standards in most projects • management/organizational system significantly supports PM • application of project knowledge management standards in most projects
L2. Standardization	<ul style="list-style-type: none"> • lack of defined PM methods and tools • selective application of defined project team management standards • management/organizational system partially supports PM • selective application of project knowledge management standards
L1. Initial	<ul style="list-style-type: none"> • lack of defined standard methods and tools for project management • lack of defined standards for project team management • lack of a management/organizational system to support project management • lack of defined standards for project knowledge management

Source: Spalek, 2013.

According to the author this is a perfectly valid approach since in recent years the importance of knowledge management in enterprises has increased significantly (Cho et al., 2003, pp. 504-510; Friesl et al., 2011; Paliszkiwicz, 2011, pp. 435-450) and also in projects (Gasik, 2011, pp. 23-44; Shida et al., 2007, pp. 279-288; Wang, 2005).

3. Research method

A systematic analysis of the literature showed that many researchers have tackled the subject matter of project management. A search through databases (including Scopus, Web of Science, Elsevier) found more than 800 publications on this topic. An analysis of these publications in terms of research area and timeliness of the data presented indicated that only 68 are related to the SME sector and most of them focus on one selected industry: mainly IT, logistics or industry. However, no publications were found discussing the assessment of project

management maturity in the sector of small and mid-sized enterprises commercializing results of scientific research.

The purpose of the study is to assess the organizational project management maturity in enterprises of the SME sector, representing various industries. Maturity is understood as the state of achieving full development, or the state of readiness of the enterprise to undertake certain specified activities. Consequently, the following research questions were formulated:

Q1. Are there differences in the level of maturity in project management between micro, small and mid-sized enterprises?

Q2. What factors have a key impact on a company's maturity level in project management?

The study used the concept of maturity levels of H. Kerzner's (Kerzner, 2001) and S. Spalek's (Spalek, 2013) models. The presented here empirical research was carried out between December 2023 and March 2024. A quantitative method was used with a survey questionnaire consisting of closed questions with a 5-point Likert type scale for assessing individual phenomena, as well as explanations of key concepts and a metric. The survey was conducted via the interankiety.pl platform.

To assess the level of project management maturity in enterprises, measures were made for four areas of modern project management (according to S. Spalek), namely: methods and tools in project management, human resources in project management, project environment and project knowledge management (Table 2).

Table 2.

Measures for assessing the maturity of enterprises in project management

Area	Measure
The area of methods and tools in project management	Project planning tools
	Project implementation tools
	Common defined language to describe project activities
	Mathematical models for planning purposes
	Collection system of project related information
	Baseline schedule
	Management of projects stakeholders
	Projects related risk management system
	Established project management policies
The area of human resources in project management	The company ensures competent workers for projects
	Managers are competent in effective project management
	Managers are competent in project planning, completion and implementation
	Project management training is provided to individuals playing specific roles in the project
	Project team members follow a code of ethics
	Project managers are trained in leadership
Project environment area	Individuals assigned to projects have appropriate competences to play the assigned roles
	The company has procedures in place to coordinate interactions that occur between projects
	The company has a defined vision for project management
	Use of benchmarking to increase project management effectiveness
	Employees understand the benefits of project management
Company uses tools to standardize, measure, control and improve project management processes	

Cont. table 2.

The area of project knowledge management	A system that measures the level of competence of people involved in projects
	Cyclic training on methods, tools and techniques in project management
	Use of benchmarking to evaluate project management with generally accepted standards
	Procedures to ensure that project managers and project team members have adequate knowledge and competences
	Implemented experience gathering process
	Procedures for using information and experience to improve project management

Source: prepared on the basis of Spalek (2013).

Small and midsized enterprises were invited to participate in the study; the main variable in selecting entities for the research sample was location by region, i.e. the northern sub-region of the Silesian Voivodship, and cooperation with the Czestochowa University of Technology for the commercialization of knowledge in the region. The latter condition made it possible to include companies that implement projects.

4. Presentation of research results

Seventy-three respondents took part in the study, the leading sectors were banking services, finances and logistics (Table 3). Companies with more than 49 employees predominated. The vast majority, more than 81%, have been implementing projects for more than a year but less than 5 years.

Table 3.

Characteristics of the study group

Size	Micro 12%	Small 30%	Midsize 58%	
Industry	IT 13%	Banking/Finances 46%	Automotive 7%	Logistics 34%
Size of the project team	1-2 persons 5%	3-9 persons 79%	More than 9 people 16%	
How long has the company been implementing	Less than a year 3%	1-5 years 81%	For more than 5 years 16%	

Source: own research.

The highest percentage (30%) of surveyed companies represent maturity level 3, the application level. This means that the following attributes are developed and applied in most projects: standard project management methods and tools, project team management standards and the enterprise organizational system supports project management. At this level of maturity, there is also a process for managing accumulated project knowledge. The highest level of project management maturity was reached by 13% of the surveyed companies, which declare to have been implementing improvements in the surveyed project maturity areas and are improving project management.

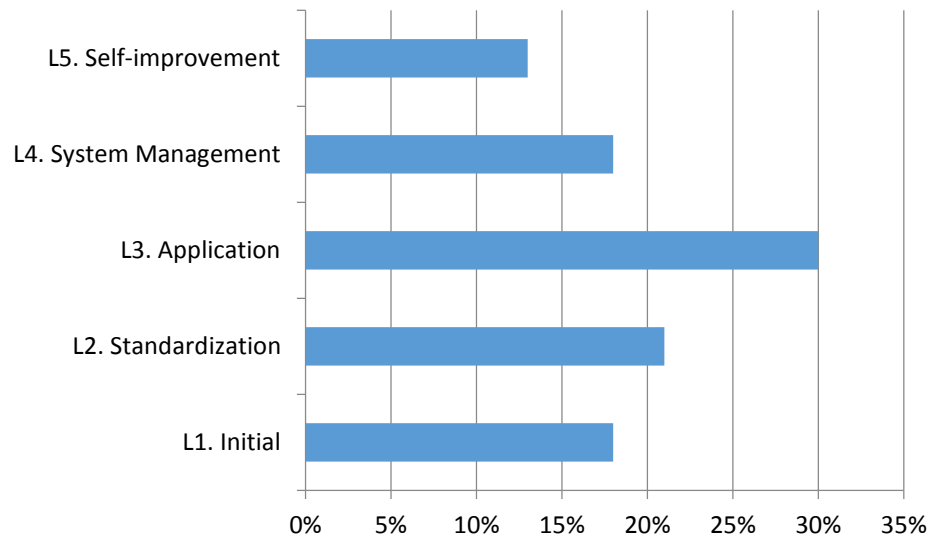
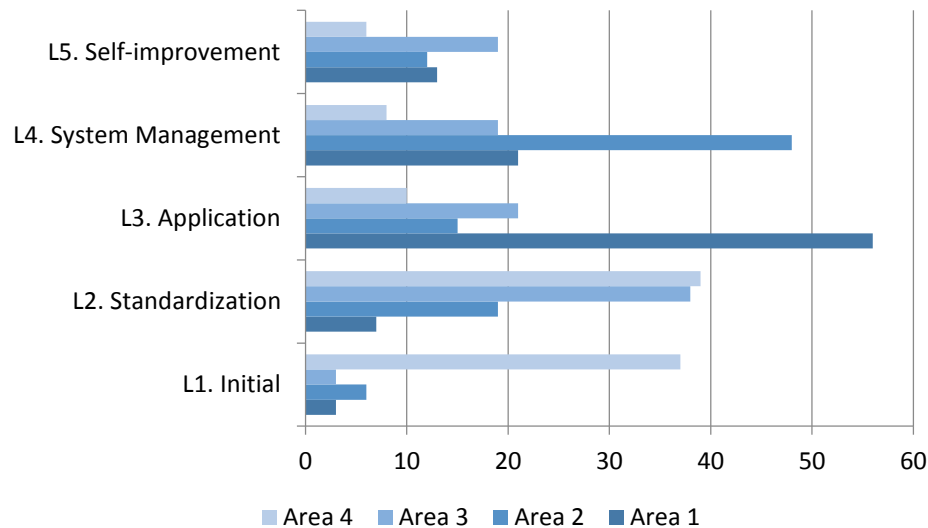


Figure 1. Levels of project management maturity of surveyed enterprises.

Source: own research.

No interrelation was found between enterprise size and project management maturity. In the groups of micro, small and mid-sized enterprises, the smallest percentage represented enterprises with maturity level 5 (4%, 8% and 7% respectively) and the largest percentage represented levels 3 and 2. In the group of micro enterprises, the total was 75%, small - 43% and mid-sized - 57%

The most dispersed results were obtained for the methods and tools area, where the highest number of indications, 56%, was for level 3, followed by 21% for level 4 and 13% for level 5. On the other hand, 3% of companies were classified at maturity level 1 and almost 7% at level 2. An analysis of the results combining levels 4 and 5 of project management maturity, shows that the surveyed companies perform best in the area of human resources with 60% of companies (48% at level 4 and 12% at level 5, respectively) caring about the skills and qualifications of employees involved in projects. The selection of project team members is not random and ethics in conduct and decision-making is an important aspect of project management. Companies show the least maturity in the area of project knowledge management. In this case, only 14% of surveyed companies show level 4 or 5 (8% and 6%, respectively) and as many as 76% show level 1 and 2 (37% and 39%, respectively). Most of the surveyed companies in this area do not have developed standards for gathering knowledge and procedures for using experience to improve project management. On the other hand, there is an emphasis on periodic training in project management methods, tools and techniques, as well as procedures to ensure the proper selection of project team members in terms of competence. This explains the high level of maturity of companies in the area of human resources.



Area 1 – methods and tool in project management,
 Area 2 – human resources in project management,
 Area 3 – project environment,
 Area 4 – project knowledge management.

Figure 2. Levels of project maturity in different areas of project management (%).

Source: own research.

The assessment of an enterprise maturity in project management is influenced primarily by the awareness of the enterprise management of the importance of systemic project management. This is the starting point for considerations about enterprise maturity, as it is only on this basis that the need to improve project management processes arises. Therefore, key project maturity factors include: standard techniques and tools used in the planning, organizing and execution phases of the project, risk management methods, and project stakeholder management methods (Table 4).

Table 4.

Key factors affecting the project management maturity of an enterprise

	Measure	Average rating
Area of methods and tools in project management	Tools for planning and organizing a project	4,9
	Tools for project implementation	4,9
	Project stakeholders management	4,6
	Risk management system for projects	4,8
Area of human resources in project management	Project management training is provided to individuals playing specific roles in the project	4,3
	Projects managers are trained in leadership	4,5
	Individuals assigned to projects have appropriate competences	4,3
Area of project environment	The company has a defined vision concerning project management	4,0
	Use of benchmarking to increase project management effectiveness	3,6
	The company uses tools to standardize, measure, control and improve project management processes	4,1
Area of project knowledge management	A system measuring the level of competence of people involved in projects	4,2
	Mechanisms to ensure the reliability of the information gathering process	4,4
	Implemented experience gathering process	3,9

Source: own research.

The research also emphasised the importance of planning and estimating project costs as well as defining measures of success. Setting up rules for assigning people to a project according to their competences is another key factor. A project management mature organisation takes care of periodic training dedicated to project team members. In addition, it makes sure that project managers have appropriate knowledge and leadership skills. Another group of key factors concerning enterprises maturity in project management is related to the system of collecting information and experience. Important here are: a system that measures the level of competence of people involved in projects, mechanisms to ensure the reliability of the information gathering process, and an implemented experience gathering process. An enterprise will represent a high level of maturity if it defines a project management vision and implements tools to standardize, measure, control and improve project management processes.

Summary

The undertaken subject matter is in line with current considerations about the direction of development of models for assessing the level of enterprises maturity in project management. The research indicated that the model proposed by S. Spalek is characterized by simplicity and flexibility of application. In the group of respondents, the lowest project maturity, at level one and two, is characterized by 39% of enterprises. A slightly smaller percentage, 31%, are enterprises with the highest level of maturity. No correlation was noted between the size of the company and its maturity level.

The conducted assessment of the maturity of enterprises in project management included an attempt to identify the key factors affecting the level of maturity. It turned out that the most important factor is systemic project management. In enterprises, the basic conditions in area of project management methods and tools must be met. Overall, a higher level of maturity was identified in the area of human resources and the lowest in the area of project knowledge management. This indicates a low awareness of the importance of knowledge, which is the cause of, among other things, a lack of standards on gathering information and experience. Such an approach to project knowledge management may result in a lack of need for enterprise development in project management. Moreover, it may constitute an obstacle to the effective implementation of projects (Kusyk, 2010). According to Wittek (2011, pp. 282-290), this can be prevented by including project management in the company's strategy. However, since the lowest level of maturity is represented by 18% of companies, the second level by 21% and the third level by 30%, a positive conclusion can be made: by reaching higher levels of project management maturity, companies are moving from the unconscious to the conscious zone of project management. This transition is very important, especially at the second level, because

it represents a turning point in the development of project management. Here we are dealing with standardisation, which constitutes the basis for the application of the adopted solutions.

According to the author the project management maturity model according to S. Spalek emphasises the importance of knowledge, which naturally encourages self-improvement. They take a similar approach Paliszkievicz (2011, pp. 435-450) oraz Gasik (2011, pp. 23-44). Project maturity will play an increasingly important role in the field of project management. Thus, the need will arise to differentiate from competitors, to compare with them in terms of project implementation skills. We can, therefore, expect similar trends to those in quality management, where the high level of knowledge in an organisation has necessitated the development of tools to distinguish one's activities from competitors. The project management maturity survey is also an excellent tool for organisations which do not have even a rudimentary awareness of the existence of projects in their operations, as well as for those which want to carry out projects more effectively but are unable to improve their project management skills.

Concerning the key factors of project management maturity, the research ought to be continued. The question of the importance of individual factors as the level of maturity changes has not been tackled. When analysing the results, such question, for example, arises: are the key factors at lower levels replaced by others as higher levels are reached? This is an interesting aspect of the subject matter under study, requiring further development. It is also legitimate to consider which approach to project management, classic or traditional, is more effective in achieving project management maturity.

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