

In memoriam - Prof. Petar Jovanović, PhD 1943 - 2018 (Editor-in-chief of *the Management journal* 1996-2006)

Petar Jovanović, esteemed scientist, university professor, dean, founder and the first editor-in-chief of the **Management: Journal of Sustainable Business and Management Solutions in Emerging Economies**, a person whose legacy in numerous fields shall not be forgotten, has left us. He was a person of awe-inspiring energy, brilliant mind and impressive work ethics.

He was born on September 6, 1943 in Kragujevac where he completed his primary education and graduated from high school. Between 1965 and 1973 he studied, graduated and earned an MSc at the Faculty of Mechanical Engineering. His thesis was titled: "Contribution to the Examination of the Development of Industrial Organization". From 1969 to 1983 he worked in Autosaobračaj Kragujevac as the GM's advisor for technical matters, then at the Institute for Planning and Management Systems; in 1976 he started working for the Belgrade Chamber of Commerce, as the secretary to the Council for the promotion of science and research. The year 1977 marks the start of his engagement at the Faculty of Organizational Sciences (FOS), at the course on *Organization and Management of Investments*. He became a staff member, as a guest lecturer in 1983, and continued into a role of full professor until 2008, when he retired.

He was a distinguished professor at FOS, he headed the Management department during several terms and was dean twice. During this period, he contributed enormously to the development of organizational sciences, development strategy and modern organization of the Faculty. He was a renowned author in scientific circles, as his books were among the first ones in this region to discuss the phenomena of management and organization. He wrote numerous books on management, project management, investments, strategic management, change management, organizational development, etc. that helped generations of students understand and adopt these disciplines. The list of his scientific papers published in leading domestic and foreign journals, symposia and congress is much longer still.

His biggest contribution is in the field of the development of various management disciplines, most prominent of which was project management. His book **Project management** is the most commonly used and widely known in this country; it has had a significant influence on the development and application of project management concept in this region. In addition to this book, he authored or co-authored many other books, monographs and manuals from the field of project management, among them: **Methods and Techniques of Project Management, Program Management, Project Manager, Management and Project Management, Managing Project Risks, Directions of Project Management Development**, etc.

Professor Jovanović also contributed to project management by founding the Faculty for Project and Innovation Management, one of the first institutions in the world to offer project management studies in bachelor, master and PhD programmes. Each year more and more students enroll into this faculty.

He was the founder and the first president of the Project Management Association in Yugoslavia – YUDRUP, and subsequently in the Republic of Serbia – an institution that is a very successful member of the International Project Management Association. By founding the Serbian Project Management Association, he wanted to promote and support professional activities of its members in order to encourage their work and improve their expert knowledge in the field of project management. Simultaneously, his leadership at the Association contributed to the national and international promotion and further development of project management. The association has been active for the past 32 years and is one of the rare non-profit organizations that managed to survive and develop, despite all the problems in recent history.

Professor Jovanović provided important scientific and expert contribution in the field of preparation, implementation and evaluation of investment projects. He introduced an investment management course in undergraduate and postgraduate studies and founded the Centre for investment management and direct cooperation with the private sector. A book that also presented an important milestone in his scientific and educational career, and whose impact on the enterprise sector was substantial, was **Investment Management**.

He was the reviewer of **Joint Methodology for Evaluating Social and Financial Investments and Efficiency of Investments in SFRY**, the first methodology for evaluating industrial investment projects in the ex-Yugoslavia. He was one of the authors of the **Rulebook on contents and scope of the Pre-feasibility and Feasibility Study** as the accompanying bylaw to the Law on Construction from 1999. This rulebook was the first one to introduce cost-benefit analysis as part of social evaluation of projects.

The contribution of Professor Jovanović transcends the development of individual scientific disciplines and extends to an entire scientific field. His scientific and expert papers in the field of management and organization are widely quoted and accepted by scientists, students and entrepreneurs. His books such as **Management – Theory and Practice, Strategic Management, Change Management, Managing the Development of a Company, Knowledge Management, Contemporary Management**, but also his papers in journals, monographs and his other works, contributed to the development of knowledge from the field of management which we, according to him, “urgently needed and obviously missed”. He constantly strived to offer systematized theoretical knowledge from the field of management and relevant practical experiences necessary for performing managerial roles. A very special place among his works belongs to the **Lexicon of Management**, published by the Faculty of Organizational Sciences, where he worked as one of the editors.

In 1996, at the Faculty of Organizational Sciences, he founded the **Management** journal, accepting the role of its first editor-in-chief. The goal of this journal has since been to enable the exchange of relevant information between scientists, researchers, managers, businessmen and all stakeholders from universities, institutes, companies and public institutions. Today, the name of the journal is **Management: Journal of Sustainable Business and Management Solutions in Emerging Economies**. Its local, regional and global reputation is impeccable, and this was confirmed by the Ministry of Education, Science and Technological Development, that awarded it the highest possible rank to be obtained by a domestic journal.

He founded and was the first editor-in-chief to **Serbian Project Management Journal**. The first issue was published in 2011 and numerous authors have published their papers in the journal so far. Over the years, it has developed and grown beyond the national boundaries; therefore, in 2017, its name changed to the **European Project Management Journal**. The journal has international recognition, papers published in it are quoted in papers published in numerous leading international magazines, while the Ministry of Education, Science and Technological Development treats papers published in this journal as papers published in a renowned national journal.

In addition to the mentioned journals, he was the editor-in-chief of **Produktivnost**, a long-time member of editorial staff to the **Tehnika** journal, as well as many others. He was a member of the Council of Delegates of the International Project Management Association, lecturer at several national faculties, multiple-time president and member of programme board for international symposia and congresses. He led several strategic scientific and research projects in the field of management financed by the Ministry of Education, Science and Technological Development. At the same time, he was involved in the development of the national business environment, as would be expected of a university professor. As an award for his work and contributions, he was awarded the **Plaque of the City of Belgrade** as well as multiple other recognitions.

He was the dean of the Faculty of Organizational Sciences during one of the hardest periods for this country. It is during this time that the faculty adopted some of the best decisions, such as the establishing of the undergraduate and graduate study programmes in management, issuing of the journal, founding of new centres, construction of the first amphitheatre, etc.

His rich and successful career was a result of constant work and his need to achieve significant improvements in education, science and management as a profession. We often hear that one’s significance can be measured by the things they left behind. Professor Petar Jovanović, PhD, has left us with a treasure.

Prof. Dejan Petrović, PhD

Analysis of the Available Project Management Methodologies

DOI: 10.7595/management.fon.2018.0027

Research question: This study aims to investigate an available project management methodologies from the standpoint of their applicability. **Motivation:** Authors are keen to present the specific characteristics of the nowadays available methodologies (PMI, IPMA, PRINCE2, YUPMA, APM, HBS, Agile methodologies etc.) that can ensure a realistic foundation upon which an adequate methodology for a certain group of similar projects can be defined. The usage of an adequate project management methodology brings numerous advantages and benefits to the project manager and project team and it shows them the right route towards project completion. **Idea:** This paper gives a review of the most highly recognised methodologies, proposed and implemented in the project management practice. Specific features of these methodologies were analysed bearing in mind the possibilities of their implementation. **Data:** The research of project management methodologies was provided using bibliometrics techniques. **Tools:** The study provides the meta analysis of the most cited research papers in the field of project management methodologies, provides comparative analysis and discuss the trends in project management methodologies application. **Findings:** It has been found that general characteristics of traditional methodologies (PMI, IPMA, APM, YUPMA) make them more adequate to be implemented in larger and more complex projects such as: investment, military, manufacturing, overhaul, etc. projects. On the other hand, general characteristics of agile methodologies lead to a conclusion that these methodologies are more suitable to use for IT projects as well as for some smaller and less complex projects, such as devising various studies, project reports, etc. **Contribution:** This study presents the meta analysis of the existing methodologies and provides the synthesis of key features of different applicable methodologies. This paper can be treated as a bottom line for further research oriented towards defining a specific methodology, adequate for certain groups of projects.

Keywords: project, project management, traditional methodologies, agile methodologies, analysis, implementation

JEL classification: H43, O22, M21

1. Introduction

Numerous complex problems that business and other organisations face on a daily basis require the implementation of modern management methods and disciplines for a more efficient functioning of these organizations. Implementation of project management is necessary in an efficient execution of various projects and enterprises. An expansion in project management implementation is closely linked to the expansion of knowledge in project management and training of competent project managers. On the other hand, this knowledge expansion is in turn connected with available procedures and methodologies proposed and implemented in the project management practice.

The project management theory and practice have provided us with a large number of practically applicable methodologies for an efficient management of a project. The project management methodology represents a set of methods, techniques, procedures, best practices, etc., used on a project. It is commonly based on a specific project management approach, one that defines a set of principles and guidelines which define the manner in which a project is managed (Spundak, 2014). The best known project management methodologies are: PMI, IPMA, APM, YUPMA, PRINCE 2, etc. (APM, 2000; IPMA, 2015; Jovanovic, 2015; Jovanovic&Jovanovic, 2009; OGC, 2009; PMI, 2013). These are mainly process methodologies and they include certain subprocesses or phases in project management. A major problem with these methodologies is that they are usually proposed regardless of the type of project. It is evident, however, that differences

* Corresponding author: Ivana Berić, e-mail: ivana.beric26@gmail.com

between the structures of certain groups of projects are rather big; hence, the methods of management of these projects have to differ as well (Besner & Hobbs, 2012). Depending on the particularity and type of project, management philosophy and culture of the organization that runs the project, a certain methodology should be chosen (Drob & Zichil, 2013). This implies the need that specific methodologies should be defined for some groups of similar projects.

This paper is meant to analyse the available methodologies and identify specific characteristics of these methodologies to serve as a basis for further work on defining acceptable methodologies for groups of similar projects. It presents only a small portion of an extensive research whose goal is to define and propose the method or a path to select a methodology suitable to some groups of similar projects.

2. Project Management Methodologies

The theory and practice of project management propose and apply a number of methodologies, with more or less success. These methodologies are mainly suggested by national or international project management associations as well as by certain organisations and institutions (Jovanovic, 2017). Some of the best known methodologies are the following:

- a) PMI methodology
- b) IPMA methodology
- c) PRINCE2 methodology
- d) YUPMA methodology
- e) APM methodology
- f) HBS methodology
- g) Agile methodologies and others.

Apart from the above mentioned, there is a large number of other methodologies developed by different organisations and institutions and implemented in the execution thereof. Here we will mention only some of them: the Japan Project Management Association methodology, the University of Sydney methodology, the University of Tasmania methodology, the University of South Carolina methodology, etc. (McHugh & Hogan, 2011).

2.1. PMI methodology

The PMI methodology was developed by a big and powerful association of project managers – the Project Management Institute (PMI) from the USA and presented in the Project Management Body of Knowledge - PMBoK handbook (PMI, 2013). This is a process methodology that proposes managing a project along ten knowledge areas (PMI, 2013):

- **project integration management** that includes processes and activities to identify, combine, unify and coordinate the various processes and project management activities within the project management process groups;
- **project scope management** – includes processes required to ensure that the project includes all the work necessary to complete the project successfully;
- **time management** – includes processes relating to defining the time aspects of the projects and processes required to manage the timely completion of the project;
- **cost management** – processes relating to project cost planning, budgeting, funding, controlling in order to complete the project within the approved budget;
- **quality management** – includes processes that enable the project to be completed in accordance with the quality required and to satisfy the needs for which it was undertaken;
- **human resource management** – processes that organise, manage and lead the project team;
- **communication management** – deals with collecting and using all information associated with the project execution;
- **negotiation in procurement management** – includes processes related to procurement and purchasing of materials and products necessary for the project execution;
- **risk management** – includes the processes of conducting risk management planning, identification, analysis, response planning and controlling risk on a project
- **project stakeholder management** – processes required to identify and analyse stakeholders, their expectations, as well as to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

The PMI methodology also proposes five groups of project management processes that, together with the ten areas of knowledge, form the basic framework of this methodology.

These groups of project management are the following (PMI, 2013):

1. Group of initiation processes;
2. Group of planning processes;
3. Group of execution processes;
4. Group of monitoring and controlling processes;
5. Group of closing processes.

Proposed by the PMI methodology for each of the subprocesses, and in accordance with a unique scheme, are the input values, methods and techniques to be used, as well as output values. Hence, the PMI methodology provides only the basic framework to enable the individual subprocesses to be worked out.

The PMI methodology is a unique methodology, suitable to be implemented in any kinds of projects. At the same time this is the major weakness of the PMI methodology – it does not take into consideration the specific features of certain types of projects.

2.2. IPMA methodology

The IPMA (International Project Management Association) has no process methodology but rather directs project management towards building the project manager's knowledge, skills and competencies thus empowering him/her to, together with the project team, manage the project in an effective manner. In order to efficiently manage the project, project managers should have competencies in 3 areas: technical competencies, behavioural competences and contextual competencies. It is on the basis of these competencies that the IPMA issues international certifications to project managers, verifying their competence to manage projects. A detailed elaboration and explanations of the IPMA approach are given in the handbook titled the IPMA Competence Baseline (IPMA, 2015).

2.3. PRINCE2 methodology

The PRINCE2 methodology was developed in the United Kingdom for the purpose of managing informatics/computer projects. It was later amended and expanded so that it should be used for other projects as well. Given that it is primarily oriented towards computer projects, this methodology insisted on good communication and on including clients into the project management process, on dividing the projects into phases and on the orientation towards the expected project outcomes.

The PRINCE 2 methodology consists of nine basic elements (OGC, 2009): Organisation; Planning; Control; Phases; Risk management; Quality in project environment; Configuration management; Change control.

The project management process carried out using the PRINCE2 methodology is most frequently observed over eight basic subprocesses: Project startup; Project initiation; Phase control; Outcome based management; Phase constraint management; Planning; Project directing and Project closure.

In addition to this broad version a narrower version is proposed and this contains four basic subprocesses: Project startup; Project initiation; Project implementation and Project closure (OGC, 2009).

Given the complexity of this methodology, its implementation requires a comprehensive knowledge of project management in order that all basic elements and basic subprocesses should be included.

2.4. YUPMA methodology

The YUPMA methodology was developed by the Serbian Project Management Association – YUPMA and, in its initial phase, it was defined for investment projects. The methodology is established on the analysis of three basic components: time, resources and costs as well as three basic subprocesses: planning, monitoring/tracking and project execution control. Creating models from these three components and three subprocesses brings us to the basic framework of the YUPMA methodology into which risk management, project change management, etc. are later incorporated (Jovanovic&Jovanovic, 2009; Jovanovic, 2015).

The YUPMA methodology has been applied and tested in several dozens of projects conducted by the members of the YUPMA and the PMC (Faculty of Project and Innovation Management) both in the country

and abroad. These were larger investment projects; however, also a number of business and IT projects were among them. The YUPMA methodology is based on the definition and elaboration of the project cycle which involves the following global phases or processes: Project definition; Project planning; Project execution monitoring and control and Project closure.

2.5. APM methodology

The APM methodology is one developed by a UK association (Association of Project Management) and is presented in the handbook under the title of APM Body of Knowledge (APM, 2000). The APM handbook is a comprehensive manual that covers a large number of areas and topics important in an effective project management implementation. The APM handbook covers seven basic chapters related to the areas of knowledge necessary in an efficient project management: Introduction into the problem of effective project execution; Strategic issues of the project; Issues of project control; Technical characteristics of the project; Commercial characteristics; Defining of organisational culture; Personnel /HR issues (APM, 2000).

The APM fund of project management knowledge also includes a detailed elaboration of the above cited chapters, giving a precise definition of elements to be dealt with within a specific chapter.

2.6. HBS methodology

The HBS methodology is a project management methodology developed by the Harvard Business School and covers three main phases in the project management process. These are the following phases: Project definition and organisation; Project planning and Project monitoring and management (HBS, 1997).

Each of the phases covers a set of activities characteristic of it. An accurate definition of project objectives and project organisation provides a solid basis for a valid project planning thereby affecting the final project outcomes. Project planning covers the development of the WBS structure, timeline development, resource analysis and risk management plan creation. These steps enable the manager and the project team to set the main tasks necessary for the achievement of project objectives, to define the time cycle of each task as well as their sequence, to define the needs for resources and possible risks in the project. Project monitoring and management refer to a systematic monitoring of project execution and comparison with the planned project outcomes. These steps provide the project manager with the information necessary for the correct project flow, inform the key participants in the project of the project progress and affects the project progress using lessons learned from the previous projects.

3. Meta Analysis of Specific Features of the Available Project Management Methodologies

To obtain an acceptable project management methodology it is necessary to conduct a detailed analysis of the existing project management methodologies and their specific features, primarily in view of strengths and weaknesses when applied to certain projects. It is also necessary to analyse and classify some types of projects and examine their specific features in view of the possibilities that certain methodologies should be implemented (Berić, 2013). This paper is meant to investigate only into the specific features of the available project management methodologies.

A brief analysis shows that all the above described methodologies, with the exception of the IPMA methodology are process oriented methodologies, i.e., methodologies involving some processes or phases of managing a certain project. To this group belong all the mentioned methodologies (PMI, APM, HBS, YUPMA, PRINCE 2). With the exception of the IPMA methodology, they differ only in the manner and the scope of defining and coverage of certain processes or phases. The IPMA methodology is not a classical methodology; it is based on strengthening certain competencies any project manager has to have in order to manage a project in an effective manner.

Apart from the YUPMA methodology, all other classical or traditional methodologies, to which agile methodologies do not belong, are the so-called uniform methodologies that can be proposed for any types of projects. This is at the same time the major weakness of these methodologies since they do not take into consideration the specific features of certain groups of projects.

Traditional methodologies were developed in large military investment projects, hence they are characterised by this continuous, phase approach, suitable for this type of projects. Consequently, traditional

methodologies have a precise and strict procedure of execution, based on the project structure defined beforehand and presented in the project documentation, as well as on a precise technology of project execution (Jovanovic, 2015; Jovanovic&Jovanovic, 2016). Agile approaches were developed as a response to evident differences among certain kinds of projects, especially to the specificities of the IT projects. Agile methodologies were developed by a group of experts for the purpose of improving the IT project management process, especially in case of software development projects. Specific principles of the agile approach are written in the Agile manifesto (Fowler & Highsmith, 2001) and in the Declaration of interdependence (Declaration of Interdependence, 2005). The idea of the agile approach is to create a more flexible approach to the management of IT projects, through an iterative approach and creation and delivery of the project in sections, with a possibility to easily introduce changes and repeat certain phases in the project execution. A flexible approach, it allows an analysis of the completed work following every phase, together with the client, as well as introduce change and amendments in order to meet the client’s desires, which is very important in software development projects where precise specifications are often missing and the client cannot be certain what outcome they can expect of the completed project (Fernandez & Fernandez, 2008; Rasnacis & Berzisa, 2017; Serrador & Pinto, 2015).

Agile methodologies are management methodologies used in software development projects and are based on the following principles: flexible work, continuous reconsiderations of the completed section or task and introduced alterations, active role of the client, a specific manner of project team organisation, continuous communication among all participants, regular meetings of the project team and the project team – client meetings (Abrahamsson, Salo, Ronkainen,& Warsta, 2002; Jovanovic&Jovanovic, 2016; Kilibarda, Sobajic, Beric,& Jovanovic,2016; Kostic, 2017; Pichler, 2010).

Further research is related to an analysis of basic characteristics of the discussed methodologies having in mind that these are general characteristics, whereas a more precise analysis and identification of strengths and weaknesses may be possible only if the subject of study is a certain group of similar projects. Having this in mind, we can say that the major characteristics of traditional methodologies (PMI, APM, YUPMA, PRINCE2) are as follows (Jovanovic&Jovanovic, 2016; Jovanovic, Jovanovic, Miletic,& Beric, 2016):

1. firm and precise project structure;
2. it is difficult to halt the execution process and take a reverse direction;
3. it is difficult to introduce alterations, especially in the middle or in the end of the project;
4. the clients’ or stakeholders’ impact on project management is minimal;
5. clear management procedures and homogeneous project team.

A similar consideration and analysis in case of agile methodologies have come to the following conclusions:

1. project structure is not firmly defined;
2. it is possible to stop the project and take a reverse direction;
3. it is possible to alter requirements in agreement with the client;
4. alterations are easily introduced;
5. firm relationship and permanent contact with the client (Jovanovic&Jovanovic, 2016; Jovanovic et al., 2016).

The table 1 (below) lists the basic differences between traditional and agile methodologies.

Table 1. Comparison of traditional and agile methodologies

Traditional methodologies:	Agile methodologies:
1. Permanent process	1. Sequential process
2. Firm project structure	2. Project structure subject to change
3. Project documentation is precise and detailed	3. Project documentation is provisional
4. Project execution technology is clearly defined and most often changing	4. Project execution technology is subject to change
5. Possible changes	5. Permanent changes
6. Rare meetings with the client	6. Regular meetings with the client
7. Multifunctional team	7. Self-organised team
8. High authority of project manager	8. Not so high authority of the manager

A partial analysis of the discussed methodologies shows that traditional methodologies are more suitable for larger and more complex projects, among which are: investment, military and overhaul projects as well as projects for manufacturing and installment of complex products. However, in case of IT projects and in case of smaller scope studies and surveys the use of agile methodologies seem to be more appropriate (Hobbs & Petit, 2017).

If we consider the projects of construction of a hydroelectric plant, a tunnel, a bridge, a manufacturing facility, it is obvious that additional changes in such projects are not realistic since they will result in an enormous delay in meeting deadlines and an increase in project execution costs. In case of such projects it is almost impossible or unacceptable to take reverse direction, change and improve the project. It is also impossible to execute and deliver the project in sections, as can be the case in some other projects, e.g., IT projects. (Elattar, 2009; Fernandez-Sanchez & Rodriguez Lopez, 2010; Semolic, Jovanovic, Kovacev, & Obradovic, 2007).

When analysing the possibility of implementation of agile technologies or agile approach, a conclusion can be drawn that these methodologies are more suitable to the IT projects. The basic features of the IT projects and the basic characteristics and benefits offered by agile methodologies point to the realistic possibilities of agile methodology implementation in this type of projects. Here we should primarily have in mind that agile methodologies offer a good opportunity for work in phases, reconsideration and change introduction, turning back to a previous phase, regular meetings and reaching agreements with the client and broader authorisation and freedom of the project team members, which is consistent with the characteristics of the IT projects. (Abrahamsson et al., 2002; Hass, 2007; Pichler, 2010; Schwaber, 2004; Sohi, Hertogh, Bosch-Rekveltdt, & Blom, 2016)

A more detailed analysis should be performed to determine the possibilities of the PRINCE2 methodology, also proposed for IT, as well as for more complex projects such as investment ones. It may be necessary to analyse the real opportunity for application of this methodology, both in IT projects and in, e.g., investment projects, given the significant differences in the structures and specific features between these two groups of projects. The analysis can be conducted in two directions. One can be a presentation of the possibility to use the PRINCE2 in case of larger and more complex projects, having in mind the possibility to use other traditional methodologies and stressing their advantages and disadvantages. The other direction can deal with the possibilities to use the PRINCE2 in IT projects and comparison with agile methodologies, where the advantages and disadvantages of the PRINCE2 and agile technologies have to be emphasized.

Following the review of project management methodologies and the basic features of these methodologies, further research should be directed towards identification of elementary phases or subprocesses (planning, monitoring, control, etc.) these methodologies use as well as basic elements (time, resources, costs, etc.) important for the project, through which the project can be managed.

In case this approach is adopted, it is possible to devise a number of tables that show relations and connections between phases and elements and enable a detailed analysis of the available methodologies.

Below are presented the shortened versions of tables interesting for further elaboration (Table 2 and Table 3).

Table 2. Methodologies and project phases (a template)

Subprocess Methodologies	Initiating	Planning	Monitoring	Control	Closure	Other
PMI						
IPMA						
APM						
PRINCE 2						
YUPMA						

Table 3. Methodologies and project elements (a template)

Elements Methodologies	Time	Resources	Costs	Quality	Risk	Other
PMI						
IPMA						
APM						
PRINCE 2						
YUPMA						

The analysis of these and similar tables can help in identifying the most important phases and elements that most frequently appear in analysed methodologies. This can help in finding a certain foundations for defining specific methodologies applicable to certain groups of similar projects, or for adapting the already available methodologies.

For situations requiring the use of two or more methodologies the literature offers hybrid, mixed or collaborative approaches, i.e., methodologies (Milosevic & Patanakul, 2005; Schwaber, 2004; Spundak, 2014). Such an approach can be used, as explained above, in larger investment projects, where agile methodologies are used in the first part of the project, whereas the other, remaining part, one that includes execution, requires the use of traditional methodologies. The hybrid approach in defining a methodology for a certain group of similar projects is based on the idea that there is no need to develop a new methodology; rather, the already available methodologies can be adapted and components of these methodologies can be used to achieve an innovative approach, adjusted to the characteristics of the projects under consideration (Spundak, 2014; Wells, 2012; Wirkus, 2016).

4. Selection of an Adequate Methodology

The problem of selecting an adequate approach or methodology in management of a project or a group of similar projects (e.g., software development projects, larger investment projects, etc.) is a topic of numerous articles listed in literature (Charvat, 2003; Chin&Spowage, 2010; Cockburn, 2000; Jovanovic, 2015; Paulson, 2001; Spundak, 2014). Similarly, a large number of authors analyse the possibilities of adapting the already existing methodologies for some groups of similar projects. It is certain that the implementation of an inadequate methodology will not enhance, but will rather lessen the chances for an efficient project completion. Hence the analyses and surveys oriented towards finding an adequate methodology for a certain project or a group of similar projects is an important but also a difficult research task.

Why is it really important to use an adequate project management approach or methodology? Primarily because the use of an adequate methodology brings numerous benefits to the project manager and project team and it shows them the correct route towards project completion. Is an efficient management possible without an adequate project management approach or methodology? Numerous authors (Charvat, 2003; Chin & Spowage, 2010; Cockburn, 2000; Joslin & Muller, 2015; Jovanovic, 2015; Milosevic & Patanakul, 2005; Shenhar, 1996; Spundak, 2014; Wells, 2012) agree that an efficient project management is not possible without an appropriate methodology. According to Chin & Spowage (2010), the most important advantages are as follows: More clearly defined project goals; Work processes are more efficient and more effective; Higher flexibility and adaptation to lessons learned; Increased accuracy in risk management planning, in challenge and complexity management planning; Ensuring a higher degree of standardisation; Clear identification of roles and responsibilities; Improved communication; Optimisation of delivery and outputs; Integration of tools, techniques and knowledge for the purpose of improving the present and the future projects; Value optimisation through lessons learned (Chin & Spowage, 2010). Additional advantages include: a better control of project goals and scope, a shorter time of project execution, a more efficient decision making, a higher client satisfaction, prompt information exchange, improved knowledge management, etc.

The use of an adequate project management methodology brings the following major advantages:

- An easier and simpler project management;
- An easier project planning and control;
- A more efficient running of the project team;
- Better communication within the project team;
- Better communication with stakeholders;
- A more effective introduction of change;
- A more efficient project risk and project quality management;
- An easier and faster achievement of project outcomes, etc.

Simply having a project methodology and following it does not lead to success. (Kerzner, 2004). We should bear in mind that the above listed benefits can be achieved only by a proper implementation of the methodology that is deemed adequate for the type of project under consideration. An incorrect implementation or implementation of an inadequate methodology may lead to confusion and disorientation and, consequently, to poor outcomes in the project execution.

Speaking in general about project management methodologies, it needs to be said that numerous definitions can be found in literature (Charvat, 2003; Chin & Spowage, 2010; Cockburn, 2000). The project management methodology is most frequently defined as a specific instruction, manual or a guide to help the project manager and the project team manage the project in a most effective manner and bring it to a desired completion. According to the PMI, methodology is defined as a set of methods, techniques, procedures, rules and good practices implemented in the project in order that project requirements should be satisfied.

Chin & Spowage (2010) define the project management methodology as a specific approach to managing every aspect of the project in the form of general and specific procedures, rules, regulations and standards. They listed four components of the project management methodology:

1. Project management processes such as initiation, planning, execution and monitoring of the project progress.
2. Selection of tools and techniques for communication and delivery to stakeholders.
3. Consolidated and aggregate set of appropriate best practices and values of project management.
4. Reference list of terminology as common denominator and language of project management.

When classifying project management methodologies Chin & Spowage (2010) suggest five different levels:

- Level one: Best practices, standards and guides;
- Level two: Specific sector methodology;
- Level three: Specific organisational methodology;
- Level four: Specific project methodology;
- Level five: Individual methodology.

They explain that each methodology has its own specificities and rank PMI and PRINCE2 methodologies into level one, while agile methodologies such as SCRUM, RAD, etc., according to them, are specific sector methodologies (Level two). When defining a methodology for a certain group of similar projects, it is important to note that numerous authors (Chin & Spowage, 2010; Oellgaard, 2013; Paulson, 2001; Shenhar, 1996; Spundak, 2014) suggest the use of a combination of traditional and agile approaches in order that advantages of these methodologies should be made a better use of when implemented in different projects. It was already said that agile methodologies can be used in the first part of investment projects and the traditional ones are more adequate to use in the execution phase. This basically means that a number of available methodologies should be used and that adaptations should be made to suit the project characteristics, environmental constraints and stakeholders' requirements.

The key word when selecting or creating an acceptable project management methodology should be adaptation, i.e., adjustment of available methodologies to a certain type of projects, rather than creation of entirely new methodologies. The company has to be capable of using a number of available methodologies and to observe a principle of amendment or remake and adjustment of some of the available methodologies to a certain type of project, or even to a certain individual project (Chin & Spowage, 2010). The development of a new methodology for every new project in the organisation is not practical; is it more convenient to adapt some of the available methodologies to a certain project executed in the organisation.

In conclusion, theory and practice offer a large number of project management methodologies and they can be a basis for innovation and adjustment to a certain type of project. It is obviously expensive and unnecessary to create an entirely new methodology. The basic methodological principles of project management are well known. Numerous project management methodologies have already been developed following this principle. In concrete situations, it is necessary to find out which project management methodology is the most adequate to implement, then identify the basic features of a certain group of projects (or a project) and finally adjust the methodology to the requirements, i.e., characteristics of the given group of projects.

Conclusion

The aim of this paper was to analyse and discuss the possibilities of implementation of already existing project management methodologies for different kinds of projects as well as to find the way to form groups of similar projects and define adequate methodologies for them.

Based on bibliometrics techniques, a short review of the methodologies, proposed and implemented in the project management practice (PMI, IPMA, APM, YUPMA, and others) was provided. The specific features of these methodologies were analysed bearing in mind the possibilities of their implementation. The results of provided meta analysis showed that general characteristics of traditional methodologies (PMI, IPMA, APM, YUPMA, PRINCE 2) make them more adequate to be implemented in larger and more complex projects such as: investment, military, manufacturing, overhaul, etc. projects. On the other hand, general characteristics of agile methodologies lead to a conclusion that these methodologies are more suitable to use for IT projects as well as for some smaller and less complex projects, such as devising various studies, project reports, etc.

This study presents the meta analysis on existing methodologies and provides the synthesis of key features of different applicable methodologies. The conclusions and the entire paper should be understood primarily as a starting point for further research oriented towards defining specific methodologies adequate for certain groups of projects.

REFERENCES

- [1] Abrahamsson, P., Salo, O., Ronkainen, J., & Warsta, J. (2002). Agile software development methods: Review and analysis. VTT Publications, 478. Espoo. Finland, 107p.
- [2] Fowler, M., & Highsmith, J. (2001). The agile manifesto. *Software Development*, 9(8), 28-35.
- [3] APM (2000). APM Project Management Body of Knowledge. The Association for Project Management. UK
- [4] Beric, I. (2013). The Analysis of the Implementation of Quantitative and Qualitative Methods in the Project Portfolio Selection and Optimization, PhD thesis, University of Belgrade
- [5] Besner, C., & Hobbs, B. (2012). An Empirical Identification of Project Management Toolsets and a Comparison among Project Types. *Project Management Journal*, 43(5), 24-46. DOI: 10.1002/pmj.21292
- [6] Charvat, J. (2003). *Project Management Methodologies: Selecting, Implementing, and Supporting Methodologies and Processes for Projects*. John Wiley & Sons.
- [7] Chin, C. M. M., & Spowage, A. C. (2010). Defining & classifying project management methodologies. *PM World Today*, 12(5), 1-9.
- [8] Cockburn, A. (2000). Selecting a Project's Methodology. *IEEE Software*. Volume 17, Issue 4. 64-71. DOI: 10.1109/52.854070
- [9] Declaration of Interdependence. (2005). Retrieved from <http://pmdoi.org>
- [10] Drob, C., & Zichil, V. (2013). Overview regarding the main guidelines, standards and methodologies used in project management. *Journal of Engineering Studies and Research*, 19(3), 26.
- [11] Elattar, S. M. S. (2009). Towards developing an improved methodology for evaluating performance and achieving success in construction projects. *Scientific Research and Essays*, 4(6), 549-554.
- [12] Fernandez, D. J., & Fernandez, J. D. (2008). Agile project management—agilism versus traditional approaches. *Journal of Computer Information Systems*, 49(2), 10-17.
- [13] Fernandez-Sanchez, G., & Rodriguez Lopez, F. (2010). A methodology to identify sustainability indicators in construction project management: Application to infrastructure projects in Spain. *Ecological Indicators*, 10(6), 1193–1201. DOI: 10.1016/j.ecolind.2010.04.009
- [14] Hass, K. B. (2007). The blending of traditional and agile project management. *PM world today*, 9(5), 1-8.
- [15] HBS. (1997). *Project Management Manual*. Harvard Business School
- [16] Hobbs, B., & Petit, Y. (2017). Agile Methods on Large Projects in Large Organizations. *Project Management Journal*, 48(3), 3-19. DOI: 10.1177/875697281704800301

- [17] IPMA. (2015). IPMA Competence baseline, version 4.0. International Project Management Association. Switzerland
- [18] Joslin, R., & Muller, R. (2015). Relationships between a project management methodology and project success in different project governance contexts. *International Journal of Project Management*, 33, 1377–1392. DOI: 10.1016/j.ijproman.2015.03.005
- [19] Jovanovic, A., Jovanovic, F., Miletic, L., & Beric, I. (2016). Application of agile methodologies in software development, *Tehnika*, 71(6), 896-900, DOI: 10.5937/tehnika1606896J
- [20] Jovanovic, P. (2015). Project management. Faculty of Project and Innovation Management. Belgrade. Serbia.
- [21] Jovanovic, P. (2017). Project management development - contemporary tendencies and methodologies, YUPMA 2017, Zlatibor
- [22] Jovanovic, P., & Jovanovic, F. (2009). YUPMA project management methodology, YUPMA 2009, Zlatibor
- [23] Jovanovic, P., & Jovanovic, F. (2016). Management of Software and Investment Projects - Traditional and Agile Methodologies, *Proceedings of the Faculty of Project and Innovation Management*, Belgrade
- [24] Kerzner, H. (2004). *Advanced Project Management: Best Practices on Implementation*, John Wiley & Sons, USA
- [25] Kilibarda, G. D., Sobajic, V. M., Beric, I. M., & Jovanovic, P. M. (2016). Software project management. *Tehnika*, 71(1), 145-152. DOI: 10.5937/tehnika1601145K
- [26] Kostic, M. (2017). Challenges of Agile Practices Implementation in the Medical Device Software Development Methodologies. *European Project Management Journal*, 7(2), 36-44
- [27] McHugh, O., & Hogan, M. (2011). Investigating the rationale for adopting an internationally-recognised project management methodology in Ireland: The view of the project manager. *International Journal of Project Management*, 29(5), 637-646. DOI: 10.1016/j.ijproman.2010.05.001
- [28] Milosevic, D., & Patanakul, P. (2005). Standardized project management may increase development projects success, *International Journal of Project Management*, 23(3), 181-192. DOI: 10.1016/j.ijproman.2004.11.002
- [29] Oellgaard, M. J. (2013). The Performance of a Project Life Cycle Methodology in Practice. *Project Management Journal*, 44(4), 65–83. DOI: 10.1002/pmj.21357
- [30] OGC. (2009). *Managing Successful Project with PRINCE2*, Office of Government Commerce Norwich, UK, The Stationary Office
- [31] Paulson, L. D. (2001). Adapting methodologies for doing software right. *IT Professional*, 3(4), 13-15.
- [32] Pichler, R. (2010). *Agile Project Management with Scrum*, Addison-Wesley Professional
- [33] PMI (2013). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. Project Management Institute. USA
- [34] Rasnacic, A., & Berzisa, S. (2017). Method for Adaptation and Implementation of Agile Project Management Methodology. *Procedia Computer Science*, 104, 43-50. DOI: 10.1016/j.procs.2017.01.055
- [35] Schwaber, K. (2004). *Agile Project Management with Scrum*, Microsoft Press
- [36] Semolic, B., Jovanovic, P., Kovacev, S., & Obradovic, V. (2007). Improving Repair Management of Bucket Wheel Excavator SRs1200 by Application of Project Management Concept. *Strojniski Vestnik*. 54. 565-573.
- [37] Serrador, P., & Pinto, J. K. (2015). Does Agile work? — A quantitative analysis of agile project success. *International Journal of Project Management*, 33(5), 1040-1051. DOI: 10.1016/j.ijproman.2015.01.006
- [38] Shenhar, A. J. (1996). From theory to practice: Toward a typology of project management styles, *IEEE Transition on Engineering Management*, 45 (1). 33 – 48. DOI: 10.1109/17.658659
- [39] Sohi, A. J., Hertogh, M., Bosch-Rekveltdt, M., & Blom, R. (2016). Does Lean & Agile Project Management Help Coping with Project Complexity? *Procedia - Social and Behavioral Sciences*, 226, 252-259. DOI: 10.1016/j.sbspro.2016.06.186
- [40] Spundak, M. (2014). Mixed agile/traditional project management methodology – reality or illusion? *Procedia – Social and Behavioral Sciences* 119. 939 – 948. DOI: 10.1016/j.sbspro.2014.03.105
- [41] Wells, H. (2012). How effective are project management methodologies? An explorative evaluation of their benefits in practice. *Project Management Journal* 43 (6). 43-58. DOI: 10.1002/pmj.21302
- [42] Wirkus, M. (2016). Adaptive Management Approach to an Infrastructure Project. *Procedia - Social and Behavioral Sciences*, 226, 414-422

Received: 2018-07-13

Revisions requested: 2018-09-05

Revised: 2018-10-02

Accepted: 2018-10-30



About the Author

Prof. dr Petar Jovanović, (emeritus)

University EDUCONS, Faculty of Project and Innovation Management, Belgrade
drpetarj@gmail.com



Petar Jovanović, Ph.D., former dean of the Faculty of Organizational Sciences, and head of the Department of Management at the Faculty of Organizational Sciences as well as founder and former dean of the Faculty of Project and Innovation Management. He has been engaged in management and project management for more than thirty years. In 1986 he established the Yugoslav Project Management Association, and since then he was the president of this association, that became the Serbian Project Management Association (YUPMA). He was an individual member of the PMI (Project Management Institute) from USA, BAM (British Academy of Management), UK and a delegate of the IPMA (International Project Management Association). He wrote a large number of papers and books about project management, and generations of project managers have been trained and learned from his books.

He defined, conducted and realized over 350 trainings and courses on management and project management, investment management etc., wrote over 70 books and 200 papers and also managed a large number of projects. He was founder and editor in chief in 2 international scientific journals.

Ivana Berić

University EDUCONS, Faculty of Project and Innovation Management, Belgrade
ivana.beric26@gmail.com



Ivana Berić, PhD, Assistant Professor and Vice dean for Education and International Cooperation at the Faculty of Project and Innovation Management and Vice President of the Serbian Project Management Association. She is actively involved in preparation of trainings, seminars, symposia, correspondence with foreign associations, and process of certification of project managers. With more than 45 published peer reviews and conference papers in Management, Project Management, Strategic management and Project Portfolio Management area, she has also worked on numerous books, monographs and proceedings and provided more than 50 trainings and seminars for different target groups.