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Project Management in the Time of VUCA: Threat or Opportunity?

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Abstract: This study addresses the "projectification of society" and its alignment with the VUCA framework (Volatility, Uncertainty, Complexity, Ambiguity). Four widely used international project management standards—PMI, IPMA, PRINCE2, and PM²—are evaluated for their suitability in the VUCA environment. The research employs a multi-criteria approach, specifically the Weighted Sum Approach method, considering factors like volatility, uncertainty, complexity, and ambiguity. The selected standards are scrutinized based on their adaptability to VUCA challenges, with a focus on PMBOK, IPMA, PRINCE2, and PM². The seventh edition of the PMBOK has been evaluated on the first position. The study emphasizes the crucial role of selecting an appropriate project management standard for success in navigating the dynamic VUCA world. The results confirmed this and brought a number of recommendations for managing projects in a VUCA environment.

Keywords: project management; VUCA; project management standard; decision making; WSA method

JEL Classification: O22

1. Introduction

A number of studies confirm the general trend of the so-called "projectification of society", indicating the increasing number of changes in society and the effort to manage these changes with the help of methods and tools of project management and thus improve the ability to manage these changes, not to be in the wake of these changes (Wagner, 2022; Fridgeirsson et al., 2021). This changing environment was labelled VUCA – Volatility, Uncertainty, Complexity, Ambiguity. The ambition of this term is to depict the current development of society, which is influenced by very dynamic technological but also social development, climate changes under conditions of a high degree of interconnectedness, uncertainty, riskiness, different perceptions of coming changes by different groups in society and high variability of conditions.

In this context, it is possible to define research questions regarding the readiness of international standards and methodologies of project management to actually offer methods and tools that will enable successful project management in this changing and uncertain environment.

The article deals with the multi-criteria approach for project management standards evaluation, based on VUCA dimensions (Minciu et al., 2020). VUCA, which is an acronym for Volatility, Uncertainty, Complexity and Ambiguity, is a comprehensive model for understanding the challenges and dynamics of today's business environment. This framework (as introduced by Minciu et al. (2020)) forms the basis for the research conducted in this paper.

Volatility points to the rapid and unpredictable changes that projects often face, which require adaptive and agile standards. Uncertainty highlights unpredictability and emphasizes the need for standards.

Complexity represents the totality of various factors in project implementation. Finally, ambiguity recognizes the presence of unclear or conflicting information that can lead to inconsistencies in project objectives.

Choosing an appropriate project management standard is an important decision that should be carried out professionally (Golpîra & Rostami, 2015; Hübner et al., 2018). The wrong choice affects the success of the project (Moura et al., 2023).

Currently, there are four international project management standards and methodologies, operating globally or within the Europe, developed by international project management associations. Project Management Institute (PMI) from USA, International Project Management Association (IPMA), founded and operating mainly in Europe, Association for Project Management (PRINCE2) from Great Britain and also operating mainly in Europe and the new PM² Methodology by PM² Alliance from the environment of institutions The European Union with the ambition to operate in Europe.

These associations try to reflect developments and gradually update their standards and include new procedures, methods, recommendations. The PMI core standard is based on a process approach and is presented in the PMBOK Guide – currently in the 7th edition (PMI, 2021). A number of other standards are available at the level of Program Management, Portfolio Management, Risk Project Management, Organizational Project Management, etc. The IPMA standard is based on a competency approach, i.e. it recommends appropriate competencies of project managers for successful project management and currently offers three standards: IPMA individuals competency Baseline, ICB version 4, The IPMA Project Excellence Baseline for excellence projects and the IPMA Organizational Competence Baseline for organizations (IPMA World, 2022). In the Czech Republic, a national version of the standard was created, the International Project Management Standard according to IPMA ICB v. 4 (IPMA CZ, 2022; IPMA World, 2022). The Project IN Controlled Environments 2 (PRINCE2) standard is a process and method-oriented approach and (Axelos, 2015; PRINCE2, 2022). The PM² methodology is newly presented in the European area, which also has a process-methodical approach and presents as its advantage the availability of the methodology (“PM² Project Management Methodology Guide 3.1”) and all artefacts for free with the aim of expanding skills in the field of project management as much as possible (PM² Alliance, 2022).

The main goal of the article is to evaluate the selected project management standards in terms of their suitability for VUCA time.

2. Methodology

The research methodology is based on the fundamental principles of scientific work, ensuring a rigorous, systematic approach. Central to methodology is the alignment of selected research methods with a clearly defined research goal, ensuring that every methodological choice directly contributes to our overall objective. These principles were applied in the context of general project management theory with a focus on multi-criterial decision making (MCDM) approaches based on WSA (Weighted Sum Approach) method.

2.1. Expert Approach

The expert approach involves gathering insights and opinions from qualified individuals, typically experts in the relevant field. In the context of research or decision-making, experts, such as professionals, academics, or practitioners, are nominated to form an expert group. Their collective knowledge and expertise contribute valuable perspectives to inform and enhance the research process, ensuring a more comprehensive and informed outcome. This approach leverages the depth of experience and specialized insights of experts to enrich the understanding of complex topics or challenges (Hohmann et al., 2018)

For collecting of data, we used expert approach. Members of international associations, university lecturers and researchers in area of project management and experts from practice have been nominated to expert group.

Three experts with more than ten years of experience in the field of project management from the academic environment and the private sector were selected for the assessment using this method. The evaluation took place on a five-point scale, where 1 meant the lowest ability of the relevant international standard to contribute to the specified criterion and 5 meant that the given standard greatly helps the fulfilment of the given criterion in project management in practice.

2.2. MCDM Problem and WSA Method

There exist three main steps in utilizing MCDM problem involving numerical analysis of a set of discrete alternatives:

- Determining the relevant criteria and alternatives.
- Attaching numerical measures to the relative importance (i.e., weights) of the criteria and to the impact (i.e., measures of performance) of the alternatives in terms of these criteria.
- Processing the numerical values to determine the ranking of each alternative.

There are many computer software, e.g., the Expert Choice (Expert Choice, 2021), Criterium Decision Plus (*Criterium DecisionPlus 3.0*, 2019), which could be used as a tool for solving MCDM problems. MS Excel was sufficient to solve our decision-making problem.

In MCDM problem are the alternatives usually denoted as A_i (for $i = 1,2,3,\ldots,M$) and criteria as C_j (for $j = 1,2,3,\ldots,N$). It is assumed that for each criterion C_j, the decision maker has determined its importance i.e. weight (W_j) for which the following formula is always true:

$$\sum_{j=1}^{N} W_j = 1 \quad (1)$$

The WSA method is based on the construction of a linear scale utility function from 0 to 1. The worst alternative (d_j) according to the given criterion will have a utility of zero, the best alternative (h_j) utility one and the other alternatives will have utility between the two extremes.

It means that the elements y_{ij} must be replaced by the input criteria when applying this method matrix by the values of y'_{ij}, which will represent the utility of the alternative A_i when evaluated according to criteria C_j. The values of y'_{ij} can be obtained for the maximization criteria according to the following formula (Stopka et al., 2020):

$$y'_{ij} = \frac{y_{ij} - d_j}{h_j - d_j} \quad (2)$$

The total benefit of the alternative X_i can be calculated as a weighted sum of partial benefits according to individual criteria (Stopka et al., 2020):

$$u(A_i) = \sum_{j=1}^{M} w_j \, y'_{ij} \quad (3)$$

Alternatives can be then ranked according to decreasing utility values $u(A_i)$.

3. Results

In the case study the WSA method is applied as a suitable method from the area of multi-criteria decision making for evaluation of the selected project management standards to improve success of management of projects in the time VUCA.

3.1. The Criteria Identification of the Affected Criteria for Client Creditworthiness Assessment

Four basic VUCA dimensions – Volatility, Uncertainty, Complexity, Ambiguity, were used as input evaluation criteria. Their meaning in context of project management is follows (Staden, 2023):

- Volatility

Volatility in the context of project management is defined mainly by the changing environment in which projects are planned and implemented. Compared to the past, this environment is changing very rapidly and fundamentally. This is due, for example, to new developments in technology (e.g. the digital transformation phenomenon), a dynamic market environment (e.g. the globalisation factor) or a knowledge-based economy (e.g. knowledge as a factor of production). The changing environment is thus a natural consequence of the evolution of society as a whole and the economy adapting to it. Such a changing environment is not only threatening, but in reality, brings a number of problems and issues that must be solved. Volatility makes it increasingly difficult for project managers to distinguish between what is urgent and what is important. The key to success is the application of agile management principles to projects. Volatility increases the importance of effective risk

management in projects. In a dynamic and rapidly changing environment, it is critical to identify potential risks early and develop strategies to mitigate or prevent them.

- Uncertainty

Uncertainty in project management is mainly due to the inability or limited ability to use data, information and knowledge from past projects in future project plans. This is due to the fact that it was obtained under different circumstances (see the changes in the environment mentioned in the context of the Volatility factor). It can only be partially used as a basis for future projects. It follows logically that if there is not sufficient quality material on past projects, it is difficult to assess their current status, let alone predict their future development. All this is affected by uncertainty. All of this is affected by uncertainty and change, which comes in far greater frequency and in many forms, out of step with previous experience. The greater the lack of data, information and knowledge, the greater the uncertainty. This is linked to difficulties in planning and decision-making. The application of risk management in projects is the key to success (Fridgeirsson, Ingason, Bjornsdottir, et al., 2021; Fridgeirsson, Ingason, Jonasson, et al., 2021). The application of risk management is a key element for managing this uncertainty, enabling the identification and management of potential risks and opportunities in a project.

- Complexity

Complexity in project management is characterised by its complexity - that is, the complexity of the individual elements and the links between them. In such a complex project "system" it is very difficult to identify key components and to implement adequate decisions. The key to success is the application of knowledge management principles in projects (Iyer & Banerjee, 2019). Knowledge management will ensure both the linkages between the project elements and the overall view. The scenario method and sensitivity analysis are recommended as appropriate methods. It is crucial for a project manager to have the broadest possible knowledge in the context areas that are related to the project in order to understand the complexity of project management. Not only knowledge, but also soft skills can help in managing project teams in such a complex environment, as communication and leadership of the project team will be more demanding and more crucial than in projects in the past.

Soft skills are critical in today's projects because they promote effective communication, teamwork, and adaptability, which are essential elements for successfully addressing complex and dynamically changing challenges.

- Ambiguity

The ambiguity phenomenon of project management is actually characterized by the impossibility of a precise statement on the various aspects of the project. Typically, for example, to the questions: in what state is the project? When will the project be completed? What will be the final project budget? The impossibility of giving an exact answer is due to the mix of all the dimensions described above, and in addition to the individuality of the respondents (different and often conflicting views of the persons involved). The key to success is defining the "conditions of validity", i.e. testing the stability of the solution, very

precisely monitoring the status of the project during its life cycle. That is, the application of sensitivity analysis or the scenario method in the context of project quality management.

3.2. Determining the Alternatives

The four most frequently used world project management standards were selected for evaluation (PMI, IPMA, PRINCE2, PM²). In addition to the mentioned international project management standards, there are a number of national, corporate and other institutional standards in the field of project management. However, the selected four standards are generally used, most widespread, continuously updated and described in detail with wide international use, which is not the case for the others. Therefore, these four were selected for the subject analysis of this article.

3.3. Multi Criteria Evaluation based on WSA Method

Inputs data for multi-criteria evaluation are presented in the criterion matrix (see Table 1).

Table 1: The criterion matrix

Criteria/ Subcriteria / Alternative	Volatility		Uncertainty		Complexity		Ambiguity	
	Agility	Issues	Risks	Changes	Soft skills	Context areas	Project status	Quality
PMI - PMBOK 7th Edition	5	5	4	5	2	1	4	4
IPMA - ICB version 4	3	3	4	5	5	5	3	4
PRINCE2 – APM Body of Knowledge 7th	4	5	3	5	1	1	5	5
PM²– PM Methodology 3.1	1	3	4	3	2	1	2	3

Note: All criteria and subcriteria in the table 1 are *"max"* type (beneficial), i.e. the higher the value the better.

The hypothetical determination of the ideal (the best) alternative and the hypothetical basal (the worst) alternative is presented in the Table 2 in their last two rows.

Table 2: The criterion matrix and identification of the worst (d_j) and the best(h_j) alternative

Criteria/ Subcriteria / Alternative	Volatility		Uncertainty		Complexity		Ambiguity	
	Agility	Issues	Risks	Changes	Soft skills	Context areas	Project status	Quality
PMI - PMBOK 7th Edition	5	5	4	5	2	1	4	4
IPMA - ICB version	3	3	4	5	5	5	3	4
PRINCE2 – APM Body of Knowledge 7th	4	5	3	5	1	1	5	5
PM²– PM Methodology 3.1	1	3	4	3	2	1	2	3
h_j	5	5	4	5	5	5	5	5
d_j	1	3	3	3	1	1	2	3

The calculation of the standardized criterion matrix, aggregate utility function and the ranking of the alternatives presented the Table 3.

Table 3: The standardized criterion matrix, the calculation of aggregate utility function and the ranking of the alternatives

Criteria/ Subcriteria / Alternative	Volatility		Uncertainty		Complexity		Ambiguity		$u(A_i)$	Rank
	Agility	Issues	Risks	Changes	Soft skills	Context areas	Project status	Quality		
weights	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125		
PMBOK 7th Edition	1	1	1	1	0.25	0	0.67	0.5	0.67	1
ICB version 4	0.5	0	1	1	1	1	0.33	0.5	0.66	2
PRINCE2 – APM Body of Knowledge 7th	0.75	1	0	1	0	0	1	1	0.59	3
PM² – PM Methodology 3.1	0	0	1	0	0.25	0	0	0	0.15	4

4. Discussion

Figure 1 presents the specific priority values of the alternatives and their final ranking. The seventh edition of the PMBOK (Project Management Body of Knowledge) has the highest utility function value, reaching 0.67, which is described in more detail in Table 3. Based on this value, the PMBOK 7th Edition is evaluated as the best alternative. The second ranked alternative is ICB (International Competence Baseline) Version 4. The third position was awarded to the PRINCE2 (Projects IN Controlled Environments) standard presented in APM Body of Knowledge 7th Edition, while the last position was occupied by the PM² (Project Management Methodology 3.1) standard. These results provide valuable insight and can assist project managers and organizations in selecting the most appropriate project management methodology for their specific needs and objectives in current changeable world.

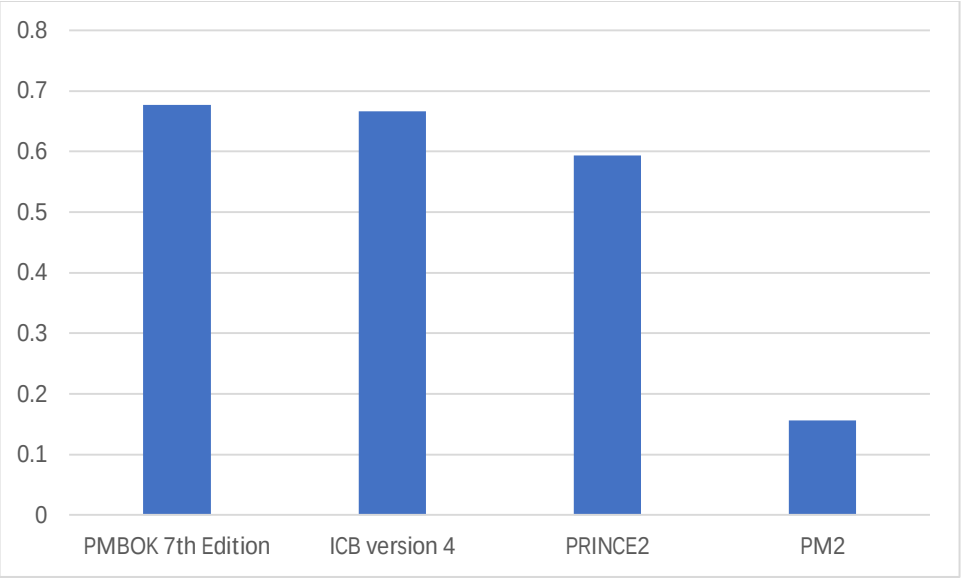

Figure 1: Graphical representation of Project Management Standards Evaluation

VUCA places great demands on high-quality and well-managed currency management throughout the project, from the pre-project stages to the end of the project. The issue of changes must be addressed not only at milestones, but at every working meeting of the project team. It is necessary to prepare for a large number of changes, thoroughly analyze the reasons, assess the benefit and impact of the change and ensure the implementation of the necessary, agreed changes. Of course, this process needs to be carefully documented. With regard to VUCA situations, it is important to add certain time and cost reserves to current projects at the very beginning, which will help to manage the resulting currencies effectively. The VUCA world does not wish megalomaniacal long-term projects. These are better avoided at present. Even big projects currently have and will have problems. Greater success will be achieved by dynamic planning and managing smaller, shorter and better manageable projects grouped into programs to cover large areas.

VUCA impacts require a high-quality analysis of project objectives, in which "stability" issues must also be considered selected goals during the project implementation time. If it is found that the goal is changing, it is necessary to consider whether it is not more efficient to stop the project and define a new project with regard to the change of goal, using the results of the stopped project to date, see e.g. STAGE GATE MODEL (Cooper, 2008; Grolund et al., 2010).

The waterfall model is not very suitable for the VUCA world and it is better to use an agile approach to project management. But this does not mean the suppression of planning processes in project management. Even in agile project management approaches, even increased attention must be paid to planning activities and prediction processes must be strengthened (Bartoska et al., 2013). It has already been shown that the waterfall model is not very suitable for, for example, R&D projects. Due to the high level of uncertainty in R&D, it is better to use an agile approach to project management (Koucka et al., 2021). This is currently evident in projects in the development of e.g. modern weapons (Dybek & Glodzinski, 2023) and in projects implementing information and communication technologies included in Industry 4.0 (Özbebek Tunç & Aslan, 2019; Bakes et al., 2022).

Choosing a team that will support multi-functional cooperation is also a beneficial step to adapting to the VUCA environment, team members will have diverse skills and perspectives, which enables a more comprehensive approach to solving problems in complex and uncertain situations. They will be ready to constantly learn and improve, think about the progress and results of the project and perform feedback, lessons learned, think about unpredictable scenarios. The human factor is also important in team management, leadership in a VUCA environment requires flexibility and the ability to inspire and lead teams through uncertainty. Leaders should be adaptable, open to feedback and able to make informed decisions quickly (McGrath & Kostalova, 2020).

5. Conclusions

The study concludes that the "projectification of society" and the evolving VUCA (Volatility, Uncertainty, Complexity, Ambiguity) framework present significant challenges and opportunities for project management. Through a thorough evaluation of four international project management standards—PMI, IPMA, PRINCE2, and PM^2—using the

Weighted Sum Approach (WSA) method, the research identifies the PMBOK 7th Edition as the most suitable standard for navigating the dynamic VUCA environment. The findings underscore the importance of selecting an appropriate project management standard, to enhance the success of projects in the face of VUCA challenges.

The discussion emphasizes key considerations for project management in a VUCA world, including the need for effective change management, dynamic planning, and the adoption of agile approaches. The study suggests that large, long-term projects may face difficulties in the VUCA world, and success may be better achieved through dynamic planning and the management of smaller, more manageable projects grouped into programs.

Furthermore, the study highlights the significance of team dynamics and leadership in a VUCA environment. It recommends building teams with diverse skills and perspectives, fostering constant learning and adaptability, and promoting effective communication. Leadership in a VUCA environment requires flexibility and the ability to make informed decisions quickly.

To effectively manage projects in the VUCA world, it is essential to have an agile mindset, be able to adapt to change quickly and employ sound risk management strategies.

Project managers should pay attention to stakeholder management and maintaining open and transparent communication.

In conclusion, the research provides valuable insights for project managers and organizations, guiding them in the selection of project management methodologies that align with the challenges and dynamics of the VUCA world. The findings contribute to the ongoing discourse on adapting project management practices to the evolving nature of societal and business environments.

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