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KEY COMPETENCIES FOR OVERCOMING CHALLENGES IN PROJECT PORTFOLIO MANAGEMENT

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Abstract: Due to the significant growth of project work in various sectors and industries, an increasing number of organizations are adopting project portfolio management to effectively manage projects of different sizes being implemented simultaneously. It becomes particularly important within IT as it represents the basis of digital transformation, enables competitive advantage, global connectivity and collaboration, facilitates growth of e-commerce, ensures protection of sensitive data and business security, and is a catalyst for innovation. However, since many organizations face challenges in project portfolio management despite the efforts they invest in using good practices in accordance with recommendations from standards and existing literature, demand for competent individuals who can deal with them and seize strategic value for organizations significantly increases. With the aim of examining the attitude of project professionals towards the competencies required for successfully overcoming the challenges at all levels and roles of IT project portfolio management, both quantitative and qualitative research were conducted among 83 project, program and portfolio managers and team members. Communication and interpersonal skills, stakeholder, information and resource management, looking at a bigger picture and strategy, prioritization, application of appropriate practices and methodologies are recognized as some of the key competencies for tackling the challenges.

Keywords: Challenges; Competencies; IT projects; Portfolio management; Project management.

1. INTRODUCTION

Projects and project organizations are an important part of today's economic and social life, and an increasing number of organizations (both in growing and mature industries) are creating dynamic work environments that involve frequent adaptation to market opportunities and changes, resulting in an increase in the number of projects being implemented simultaneously (Blomquist & Müller, 2006; Klindžić & Vlahov, 2019). Therefore, there is a need to establish a project portfolio which focuses on selecting, prioritizing, integrating, managing, and controlling projects in the multi-project environment of modern organizations as a way to temporarily organize and balance the use of limited resources and overcome traditional obstacles to organizational change (Clegg, et al., 2018; Young & Conboy, 2013). With a structured approach to decomposition and system integration, it is possible to first distribute projects into groups (most often functionally similar) and then find the logic in the integration and connect them (Grönevall &

Danilovic, 2014). Project, program and portfolio can be seen as ways of organizing (patterns, intertwined practices, behaviours and processes that bring people together) used to shape strategic change initiatives (Geraldi et al., 2022). Some studies (Elonen & Artto, 2003; Lowell & Pennypacker, 2002; Patanakul & Milosevic, 2008) distinguish project portfolio management (alignment of projects with corporate strategy with a focus on methodologies for evaluation, selection and ranking of projects) from multi-project management, which is focused on operational issues such as resource allocation, planning and risk. In this paper, these two categories will not be distinguished, but research covers both.

Furthermore, IT industry plays a vital role in the global economy, which will continue to grow as digitization accelerates, and in today's times of increased entropy resulting from crises or military conflicts, its stable functioning is extremely important (Oleksii et al., 2023; Yamin, 2019). Information technologies are crucial for supporting efficient operations and innovations and as such have an essential role in the process of digital transformation of organizations (application of digital technologies to change business processes, operations, products and services of the organization) (Hanelt et al., 2021; Kraus et al., 2021). Information technology implies the creation, processing, storage, protection and exchange of all forms of electronic data using computers, storage systems, network technologies, physical devices, infrastructure and processes (Yamin, 2019). One approach to ensure that IT creates long-term competitive advantage and sustainable value is through aligning and linking IT projects with related business goals using IT project portfolio management (Häckel & Hänsch, 2014). IT portfolio management is the ongoing process of managing IT assets and the interdependencies between different asset components to maximize portfolio benefits, minimize risks and costs, and ensure alignment with organizational strategy (Kumar et al., 2008; Wu et al., 2023). However, despite the prominent importance and ubiquity of IT in modern business and the world in general, statistics show that two-thirds of IT projects fail to be delivered on time, within defined deadlines, within budget, and/or fail to meet expected results (Paz & López, 2023). Previous

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research identified **challenges related to insufficient processes** as the most common challenges in IT project portfolio management (e.g. poorly formulated vision and standards, uneven application of project selection and prioritization criteria, failure to consider non-financial criteria when selecting projects (impact on strategy and probability of success), unclearly defined business benefits, scope and components not defined in sufficient detail (as a result, management does not notice deviations from the target and applies corrective actions too late), poor performance monitoring, irregular portfolio update cycles lack of proper portfolio management structure (Bathallath, et al., 2016; Geraldi et al., 2022; Gleisberg et al., 2008; Häckel & Hänsch, 2014; Hansen et al., 2017; Hoffmann et al., 2017; Hoffmann, et al., 2020; Lauesen, 2020; Teubner, 2018; Schnabl & Grechenig, 2020). Failure to take regulatory requirements into account and frequent exploitation of short-term market opportunities leads to failure to consider margins in the initial stages of planning which results in **inadequate resource management** (e.g. resource balancing, deviations from the planned budget, resource problems and lack of resources due to launching projects for self-interest (Hoffmann et al., 2017)). Bypassing formal portfolio management and accumulating work on key resources leads to workarounds implemented in projects that are not part of the portfolio, increased amount of technical backlogs, resource overload, poorly executed projects, and inability to flexibly respond to changing organizational strategies (Hoffmann, et al., 2020), exceeding deadlines and poor time management (e.g., schedule deviations, new proposals from different channels causing delays to ongoing projects), lack of information and productivity (Bathallath, et al., 2016; Gleisberg et al., 2008; Hansen et al., 2017; Hoffmann et al., 2017; Hoffmann, et al., 2020; Schnabl & Grechenig, 2020; Teubner, 2018). The complexity of **managing project interdependencies** (eg. resource, technological, technical, market, learning-based) can increase significantly as the number of projects in a portfolio grows. Ineffective management of interdependencies can lead to budget wastage and competition between projects, lack of support from key stakeholders, lack of conceptualization of IT portfolio management, unclear authority, roles and

responsibilities, as well as decreasing employee trust in the power and value of IT project portfolio management (Bathallath, et al., 2016; Geraldi et al., 2022; Gleisberg et al., 2008; Häckel & Hänsch, 2014; Hoffmann et al., 2017; Hoffmann, et al., 2020; Lauesen, 2020; Schnabl & Grechenig, 2020; Teubner, 2018). Other identified challenges include **insufficient communication and information**, **stakeholder and expectations management**, and **technical problems** (e.g. challenges and difficulties during execution due to lack of expertise, different perceptions and disagreements between experts, poorly developed technical solutions, customized technical solutions leading to additional work that is often not part of any project in the portfolio) (Bathallath, et al., 2016; Gleisberg et al., 2008; Hansen et al., 2017; Hoffmann et al., 2017; Hoffmann, et al., 2020; Teubner, 2018).

Portfolio management competencies in the IT industry undoubtedly have a positive impact on more successful implementation and delivery of portfolio components, which is why it is of importance to know which competencies have been recognized as relevant. Portfolio management competencies do not only include expanding project management competencies, but there is a need for a more subtle combination of interpersonal skills, personal credibility, a deep understanding of the politics of formal and informal networks that form the organizational context and knowledge of the broader strategic context (Partington et al., 2005; Pellegrinelli, 2002) given that portfolio managers are individuals responsible for establishing and implementing portfolios, but also ensuring the appropriate links between all portfolio components (Gareis, 2000; Patanakul & Milosevic, 2008; Patanakul & Milosevic, 2009; PMI, 2017). Although different authors and models define the concept of competency differently, in a narrow sense it can be understood as a combination of knowledge, skills and abilities, the so-called KSA model (Rastovski et al., 2023; Rodriguez et al., 2002). Key standards in the field accept this basis and define competency as the application of knowledge, skills and abilities (conditioned by experience) to achieve desired results, where knowledge is the totality of all information and experiences that a person has, skills are specific technical knowledge, and ability is the effective delivery of knowledge and skills in a

particular context (IPMA, 2015). Experience is highlighted as an essential factor without which competence cannot be demonstrated or improved. Furthermore, competencies are a set of related knowledge, attitudes, skills and other personal characteristics that affect a large part of someone's work (one or more key roles or responsibilities) and correlate with performance at work, can be measured against standards and improved through training and development (PMI, 2017). These are measurable human capabilities that are required to perform a job effectively and the knowledge, skills, mindsets and patterns that, when used in combination or individually, result in successful performance (Sanghi, 2016). Project portfolio management standards of competencies can serve as reference points for assessing qualifications within an organization, and represent a good starting point for considering how competencies align with generally accepted industry norms and practices (IPMA, 2015; PMI, 2017; Young & Conboy, 2013). Previous research pointed out that key competencies in portfolio management are competencies **to see the organization as a whole within a specific context** (eg. setting a long-term vision and assessing the effect of long-term decisions and strategic opportunities, propensity for innovation, planning and improving the strategy of IT services in order to maximize the value derived from current and future investments, determining priorities among portfolio components, using formally defined processes for their management, effective management of stakeholders and their expectations), **to determine priorities among portfolio components** (eg. using formally defined processes for their management and adequate allocation of limited resources, including standards and organizational elements, selection and allocation of projects according to previously defined criteria, finding a good match between project requirements, available resources and people capabilities), **leadership** (eg. team management, creating a productive team environment, motivating team members, sharing information and credit for successes, providing feedback, skills related to virtual team management, empowering, motivating and organizing people to achieve common goals), **communication** (eg. communication at multiple levels, listening, verbal and written

skills, establishing and maintaining effective relationships and written/oral communication within and outside the organization), **stakeholder management**, **scope management** and **technical competencies** (De Araújo & Pedron, 2015; Keil et al., 2013; Patanakul & Milosevic, 2009; Parolia et al., 2013; Stevenson & Starkweather, 2010).

However, despite the significant attention placed on competencies for managing IT project portfolios, previous research insufficiently examines their importance in overcoming the challenges. Therefore, with the goal of building on the observed research gap, empirical research was done among project, program and portfolio managers and team members to examine their attitudes towards the competencies required for successfully overcoming the challenges at all levels and roles of IT project portfolio management. In the next part of the paper, an overview of the used research methodology and sample is given, followed by the research results and discussion, as well as the conclusion, including limitations and recommendations for future research.

2. METHODOLOGY AND SAMPLE DATA

To examine the main challenges in portfolio project management, competencies and best practices for addressing these challenges both qualitative and quantitative research were undertaken among professionals in the IT industry. Targeted individuals were project, program and portfolio managers, and project team members. The first step in finding respondents was to identify a set of companies among the top 100 by revenue in the IT industry in Croatia to which a query about their interest to participate in the research would be sent, together with a questionnaire to check whether the company is relevant for the research, including the questions about their project orientation and use of project portfolio management in their business to achieve strategic goals. During this process, 41 companies were identified, of which 16 ultimately participated in the research in May 2024.

The qualitative research was conducted in the form of structured in-depth interviews with individuals on the leading positions in project portfolios. Interviews were done in person and lasted between 45 and 60 minutes. Given the sensitivity of the obtained data, respondents requested complete anonymity and discretion, as the challenges sometimes involved stakeholders and respondents were in no position to disclose business details to a third party. The demographic characteristics of the individuals in the sample are shown as a summary in Table I. Slightly more than half of the respondents in the sample are male (56.25%). 50% of respondents are in the age category between 30 and 39 years, 31.25% between 40 and 49, while 19.75% are older than 50 years. As for the work experience, almost half of the respondents have up to 15 years (43.75%), 37.5% between 16 and 25, while 18.25% have more than 25 years in total.

Table 1: Sample characteristics (in-depth interview)

Variable	Data distribution
Gender	Men – 56.25%, Women – 43.75%
Age	Between 30-39 years old – 50%, between 40-49 – 31.25%, older than 50 years – 18.75%
Work experience	Up to 15 years – 43.75%, 16-25 years – 37.5%, more than 25 years – 18.75%

The roles, responsibilities and activities of the respondents include monitoring of trends in the field, planning, prioritization and supervision of projects and programs in the portfolio in accordance with the strategic goals of the organization, mentoring project and program managers, the design and implementation of project methodologies and processes, finding adequate resources and their allocation, stakeholder management, leading multidisciplinary teams and development of their competencies, as well as administrative obligations and tasks.

The portfolios are different in size and type, ranging from development projects and

maintenance of digital infrastructure for Middle East markets, realization of the IT global supply chain including network and system engineering and IT support, taking care of all ongoing projects of the organization such as independent enterprise projects, production under agreement, R&D projects and tenders, managing the development of multidisciplinary projects to taking care of hundreds of projects a year in the IT consulting business.

The quantitative research was conducted via online questionnaire to gain a broader insight into the perspective of project team members. Respondents who participated in in-depth interviews were asked to distribute the questionnaires among team members who participated in the implementation of their portfolios. The questionnaire consisted of six questions related to the research problem and additional questions related to respondent's demographic and professional background. Most of the questions were open-ended and referred to challenges encountered within the projects, ways and competencies to overcome them. Close-ended question was referring to most encountered challenges within the projects (the offered list was derived from qualitative research, with the possibility of adding their own challenges). Remaining part of the questionnaire included questions about respondents' demographics, close-ended (eg. gender, age) and open-ended questions (eg. work experience, main responsibilities on project/s). The estimated time for completing the questionnaire was 10 to 15 minutes. During the survey, ethical principles related to its implementation were respected, such as anonymity and voluntariness, the right to express one's own opinion, and the right not to participate in the research. A total of 67 correctly completed surveys were collected. It is interesting to note that over 40% of respondents are currently working on three or more projects, 27% are working on two projects, while only 21% are working on a single project within the portfolio. The demographic characteristics of the individuals in the sample are shown as a summary in Table 2. Majority of the respondents in the sample are male (77.62%). 26.87% of respondents are in the age category between 20 and 29 years, 38.81% of respondents are in the age category between 30 and 39 years, 17.91% between 40 and 49, while 16.41% are older than 50 years. As for the work experience, 28.36% respondents have up to five years of experience, 23.88% from 6-10 years, 14.92% from 11-15 years, 22.39% 16-25 years and 10.45% more than 25 years in total.

Table 2: Demographic data of the respondents (questionnaire)

Variable	Data distribution
Gender	Men – 77.62%, Women – 22.38%
Age	Between 20-29 years old – 26.87%, between 30-39 – 38.81%, between 40-49 – 17.91%, older than 50 years – 16.41%
Work experience	Up to 5 years – 28.36%, 6-10 years – 23.88%, 11-15 years – 14.92%, 16-25 years – 22.39%, more than 25 years – 10,45%

Respondents have various tasks within project teams such as technical project management, IT system planning and implementation, technical implementation of IT solutions and development of software, education of users, mentoring trainees and students, organization and planning of project activities and assignments providing support, proposing improvement and consultation related to IT system architecture. Most often, these are engineers, development engineers, developers, business analysts, solution architects and designers.

3. RESEARCH RESULTS AND DISCUSSION

The data collected via in-depth interviews were organized, coded and analyzed using the Grounded theory method (Corbin & Strauss, 2008). The results are presented in the following chapters around constructed codes, accompanied by appropriate quotes marked with letters of a general nature to preserve the anonymity of the research participants. Additionally, the data collected via questionnaires among team members are presented at the end of each section.

3.1. Portfolio management challenges

The first area of challenges focuses on human resource management and resource dependencies, from finding and building resources for technologically demanding projects, organizational challenges of coordinating resources related to a hybrid way of working, overloading key resources to the lack of individual experts and departures from the organization:

"The hybrid way of working and the general organization of people brought new segments to the business that we have not addressed or recognized so far, as part of the culture that has been built in the organization for many years is missing. The challenge is to handle a large number of people, some of whom are at home, some at work, some at the seaside, some perhaps working on something that is not agreed upon within the framework of that working day." (O)

"The challenge is the acquisition and preparation of human resources that will be able to deal with a selected subset of technologies and work on the project in a way to deliver what the market is looking for." (K)

"The quality of the workforce is also a challenge, recently the quality of competence has dropped a lot. There are simply no people on the market or there are, but the knowledge of developers is not up to par, even though they have some senior developer titles, they fail to meet a certain minimum in technical interviews" (E)

Multiple projects being implemented simultaneously with the same human resources participating in the implementation lead to overload and problems with resource allocation and prioritization that arise due to the complex network of cooperation between the team, the customer and the vendor. Lack of resource planning in advance often results in a shortage of key people with the appropriate competencies:

"You know what is best for the portfolio and which project would be good, but that doesn't mean that resources will be secured." (L)

"It is necessary to plan project resources well in advance to ensure that key people with key competencies are obtained. It is important to be able to recognize which key competencies are needed on the project - to include an end-to-end understanding of the entire solution, not just the part on which the project is based. Timely resource planning and identification of the necessary competencies is something that is very important, especially in the age of technology development at a very fast pace." (P)

"Everything is of equal importance, everything needs to be realized within roughly the same deadlines and the people working on the projects are the same people. Resource allocation and defining priorities are high on the list of the most significant challenges." (N)

The second area of challenges is related to immaturity of processes in project portfolio management with insufficiently defined roles and responsibilities:

"The biggest problem is that there is no maturity in processes. There are no global processes, there are no clearly defined rules about who owns which process, what are the inputs/outputs of a certain process and who is responsible for what." (B)

"Our company is relatively young, it has existed for about 10 years and has grown a lot, but there are still patterns specific to the business of smaller organizations where processes are not fully defined and documented." (C)

The third area of challenges are challenges connected to lack of information and communication barriers. They include situations such as introductions of new tasks and projects without prior notice, lack of coordination between individual departments, insufficient information and knowledge transfer practices, complex communication channels, lack of transparency and synchronization:

"Often new activities become very urgent as soon as we get them, and the team is already working on other things planned for that specific period." (A)

"Many people have been here for a long time and have learned a certain way of working. We have long-standing clients who are used to working in a certain way and it is very difficult for someone who comes from outside as a new person to fit in and understand what is going on." (N)

"When there are a lot of people, another aspect is that there are a lot of communication channels and a lot of opportunities for misunderstandings. There are challenges of coordinating everything so that we all work on the same thing and go in the same direction." (G)

"Challenge is that I don't have insight into the overall workload of my team. I can see it from records and work schedules, but if a person doesn't fill out the timesheet (and there are those who don't), it's hard to see. In addition, people keep records in five different places and nothing is synced - timesheet, PM tool, calendar - that should be simplified for people." (I)

"The most significant challenge is delay due to past projects (those are projects that were done a few years ago, they have been delayed and changed compared to the initial plan) then, for example, last year instead of working on the current project we worked on a project that was supposed to be finished two years ago. That is the main problem, we have delays that build on each other and we can't push them to the green light." (G)

In addition, challenges are related to delays, pressures and urgency, as well as insufficiently detailed planning of projects, their implementation and overly optimistic estimates:

"It all boils down to entering the project too optimistically, for too little money and too little time. Then all the problems are connected to that. The project needs to be set on a sound footing and include the team in the assessments behind which they stand, for which they have given their commitment." (F)

"When a project is implemented, the challenge of planning arises. I would say that the biggest burden on PMs is at the beginning of the project, when the project actually needs to be set up to organize everything, administratively and resource-wise. And that must be done in cooperation with the members of the technical team, which can be quite difficult." (H)

The fourth area of challenges are the challenges related to stakeholder management which include different stakeholder cultures and harmonizing the needs of all stakeholders with the needs of the portfolio:

"The second biggest problem is that the majority of suppliers are from other cultures, they promise a lot in the initial part of contracting, and when it comes to the part of implementation, things get stuck" (B)

"Stakeholder management and management of expectations as far as external relations are concerned are the most significant challenges. Harmonizing the needs of internal and external stakeholders with the needs of the portfolio." (L)

Other challenges include the development of technological strategy and usage of different technological domains of the project, lack of teamwork, team integration and commitment, bureaucracy and administration related to tenders:

"Currently, and considering the type of organization we are, the biggest challenge is the huge variety of technologies that exist on the market and the dynamics with which the technological landscape is changing. If you're not careful, the market moves on and it's hard to catch up once you've lost your rhythm." (K)

"Sometimes lack of teamwork, sometimes colleagues are not result driven or motivated enough, and are not ready to go the extra mile to make something work (because it is not directly in their job description)." (B)

"I definitely see the process behind tenders and bureaucracy as a big challenge. We as software engineers always bring and try to bring new value, and bureaucracy most often suffocates that point. And maybe when you want to do something smarter and better, bureaucracy will more or less close you down and stifle you in it and say do it as someone specified, even though that specification may

not have some of the quality that it could have."
(O)

The results of the questionnaire show that 31.34% of respondents recognize resource management as the most encountered challenge, followed by lack of information (27%), project and portfolio process management (18%), deadlines and time management (13%), stakeholder management (6%), technical and other problems such as implementing solutions for which no feasibility study has been done, undefined technical documentation, lack of mentors and inadequate leadership (4.66%).

3.2. Project management competencies for managing portfolio challenges

After identifying the main challenges within the project portfolio, the respondents were asked to think of the ways and key competencies for overcoming them. The results of the in-depth interviews highlight 15 competencies starting with **communication and interpersonal skills** including building trust with people, asking relevant questions, actively listening, clearly expressing ideas, communicating and adapting to different groups and situations inside and outside the portfolio. This is crucial to enable the fluid exchange of information and prevent misunderstandings to successfully manage components of the portfolio, as well as to ensure effective cooperation and the achievement of common goals. **Stakeholder and expectations management** includes identifying key internal and external actors of the portfolio and their interests, cooperation between project teams and defining overlapping tasks that can be done together or shared, maintaining long-term relationships with clients through constant contact and monitoring areas of interest to them, cooperation with the technical community, which contributes to direct involvement and influence on market trends, and understanding and managing diversity, reducing conflict situations and ensuring stakeholder support for the portfolio. **Looking at the bigger picture and strategy** is important for understanding the overall portfolio environment and the organizational context in which the portfolio is established, determining a strategy that aligns organizational vision and strategic goals with

the desires and needs of clients, and applying organizational policies and standards. The focus should be on not favoring one type or group of projects but basing the decisions on clearly set selection criteria to maintain a balanced approach to all projects within the portfolio and monitoring the portfolio from the perspective of positioning the organization in the overall market. It additionally focuses on **choosing the right projects, planning and prioritization** with an emphasis on determining key clients and projects in the portfolio, estimating the necessary skills, reducing the necessary work to understandable steps arranged in a logical order and scheduling work tasks. **Resource management and resource building** focused on good resource planning, identifying and securing necessary resources on time, resource development and outsourcing when the resources are not available within the organization, reduce the likelihood of overloading the key resources and occurrence of delays. Effective allocation of resources according to project priorities ensures that resources are available when they are needed most. **The design, establishment and implementation of processes and project methodologies** in project, program and portfolio management starts from defining key processes at all levels of portfolio management, defining standards, lessons learned and procedures, preparing relevant project documentation, defining the responsibility matrix, choosing an adequate project methodology and a certain degree of formalization. It is important to record all activities, decisions and events during the project in detail to ensure transparency, accountability and consistency in work. Well-maintained minutes provide valuable insight into the progress of the project and serve as a valuable source of information for future referencing and analysis. Additionally, **information management** such as creating knowledge repositories or databases, documenting technologies and information essential to work facilitates the onboarding of new team members and knowledge transfer, while creating an environment for all individuals within the portfolio to understand what is expected of them and what tools and resources are available to them in their work. Other competencies mentioned to a lesser extent include **resourcefulness**, **basic knowledge in finance and accounting**,

recognition and selection of techniques for **resolving conflict and risk situations**, **self-awareness**, **analytical skills**, **team management**, **change management** (e.g. change requests in the project scope) and **technical skills** in the field of IT.

The results of the questionnaire show that project team members highlight similar competencies as respondents from the leading positions in the portfolio, with **communication and interpersonal skills** at the top (49%), followed by **technical skills** (28%), **organization** (13%), and **resource management** (10%). Other recognized competencies include **planning, using project management processes**, **stakeholder and expectations management**, **collaboration and information**, **time management** and **decision making**.

Identified competencies, together with areas of challenges and specific issues they resolve/improvements they introduce are shown as a summary in Table 3.

Table 3: Key competencies for overcoming challenges in project portfolio management

Competencies identified through research	Area of project portfolio challenges	Specific challenges resolved/ specific improvement introduced
Communication and interpersonal skills	Challenges related to lack of information and communication barriers	✓ avoiding insufficient information ✓ better knowledge transfer ✓ easier usage of complex communication channels
Stakeholder and expectations management	Challenges related to stakeholder management	✓ different stakeholder cultures ✓ harmonizing the needs of all stakeholders with the needs of the portfolio
Looking at the bigger picture and strategy	Challenges related to lack of information and communication barriers	✓ better coordination between individual departments
Choosing the right projects, planning and prioritization	Challenges related to human resource management and resource dependencies	✓ overload and problems with resource allocation ✓ prioritization that arises due to the complex network of cooperation between the team, the customer and the vendor
Resource management and resource building	Challenges related to human resource management and resource dependencies	✓ finding and building resources for technologically demanding projects ✓ organizational challenges of coordinating resources related to a hybrid way of working ✓ lack of resource planning in advance ✓ overloading key resources
Design, establishment and implementation of processes and project methodologies	Challenges related to immaturity of processes in project portfolio management	✓ no processes, no clearly defined rules about who owns which process
Information management	Challenges related to lack of information and communication barriers	✓ introduction of new tasks and projects without prior notice
Resourcefulness	Challenges related to human resource management and resource dependencies	✓ quality of the workforce - no adequate people on the market
Resolving conflict and risk situations	Challenges related to lack of information and communication barriers	✓ lack of transparency and synchronization
Team management	Other challenges	✓ lack of teamwork ✓ team integration and commitment

Technical skills	Other challenges	✓ development of technological strategy ✓ usage of different technological domains of the project
Other competencies (basic knowledge in finance and accounting, self-awareness, analytical skills, change management, time management, decision making)	Other challenges	✓ reducing the work to be done to understandable steps and arranging the steps in a logical sequence ✓ scope change management ✓ budget and assets management, control of daily operations and improvement of implementation of all aspects of project portfolio management ✓ bureaucracy and administration related to tenders

4. CONCLUSION

This paper aimed to identify and analyze the key competencies needed to effectively manage a portfolio of IT projects in the face of various challenges. The research was conducted by analyzing the available professional literature, followed by the combination of qualitative and quantitative research among project, program and portfolio managers and team members from the IT industry. The research showed agreement to a large extent about certain key competencies for successful project portfolio management. In particular, competencies such as communication, resource management and stakeholder management, establishment and implementation of project portfolio management processes and application of appropriate project methodology are recognized as key competencies both in the literature and among the IT experts who were surveyed. However, there are also areas where the findings of primary and secondary research differ. For example, even though the literature emphasized the importance of team management, leadership, organizational culture and experience, solving conflicts and problems, respondents from the primary research emphasized the importance of these competencies to a lesser extent. Additionally, the results of the empirical research highlighted the ability to see and assess situations and challenges in a broader context, strategy, prioritization, interpersonal skills, and information management as critical for success in their context.

In ensuring that obtained results can improve the actions of individuals when dealing with project portfolio challenges, while also overcoming the limitation of this research

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including the sample size and nature (limited to internal project portfolio roles), as well as the capability of cross-sectioning of data gathered in just one country which disabled statistical generalization and transferability of the findings to other cultural or organizational environments, the authors suggest broadening the future research in several ways. First, by gathering longitudinal data across countries to establish causal relationships among different variables, add more strength to the findings, apply the conclusions to a wider context and understand how key competencies evolve over time and under the influence of emerging trends, followed by inclusion of external stakeholders into the sample and placing the focus on the adequacy of educational and training programs in preparation of individuals for various roles within the project portfolio, capable of improving their actions not only by taking into account the challenges at their level of action, but also by recognizing the challenges of other roles, in order to contribute to the optimization of the performance of the entire project portfolio.

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