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**INTERDISCIPLINARNOST
KAO KLJUČNA KARIKA
PROJEKTNE PROFESIJE**

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PREDGOVOR

Udruženje za upravljanje projektima Srbije - IPMA Srbija, organizovalo je XXVII Internacionalni kongres iz upravljanja projektima. Ovogodišnji kongres zajednički su organizovali Udruženje za upravljanje projektima Srbije - IPMA Srbija i Fakultet za projektni i inovacioni menadžment - prof. dr Petar Jovanović.

Kongres pod nazivom „INTERDISCIPLINARNOST KAO KLJUČNA KARIKA PROJEKTNE PROFESIJE“, je održan sa idejom da otkrije i predstavi savremena teorijska saznanja i praktična dostignuća u oblasti upravljanja projektima. Kongres je okupio istraživače i eksperte iz prakse, koji su kroz plenarna izlaganja, različite sekcije, okrugle stolove i radionice prezentovali rezultate svojih istraživanja, praktična iskustva i inovativne ideje u oblasti upravljanja projektima, sa posebnim fokusom na važnost interdisciplinarnosti u ovoj dinamičnoj profesiji.

U današnjem svetu, u kome se tehnologija i društvo neprestano razvijaju, projektni menadžeri se suočavaju sa sve složenijim izazovima. Interdisciplinarnost postaje ključna komponenta za uspešno vođenje projekata, jer zahteva saradnju različitih disciplina, kao i sposobnost da se integrišu različiti pristupi i perspektive.

Zbornik radova predstavlja skup istraživanja i primera dobre prakse, nudeći nam uvid u različite perspektive i pristupe interdisciplinarnosti.

Nadamo se da će ovaj Zbornik pružiti inspiraciju i podsticaj svim profesionalcima u ovoj oblasti da razvijaju svoje veštine, grade mostove između različitih disciplina i ostvaruju uspeh u svojim projektima.

Hvala svim autorima koji su doprineli ovom Zborniku.

Beograd,

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Prof. dr Vladimir Obradović

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INTERDISCIPLINARNOST U MENADŽMENTU I UPRAVLJANJU PROJEKTIMA

INTERDISCIPLINARITY IN MANAGEMENT AND PROJECT MANAGEMENT

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1. UNDERSTANDING INTERDISCIPLINARITY IN CONTEMPORARY MANAGEMENT

Today, we are facing how important interdisciplinarity in management and business has become, while traditional approaches for solving complex problems are insufficient. It is important to understand that interdisciplinarity refers to the collaboration and integration of multiple disciplines for addressing and solving complex problems and challenges in different areas. Many organizations recognize that a multidisciplinary perspective is needed to address the numerous management and business issues. There are many global initiatives that have helped establish an inter-disciplinary framework in different management and business fields. Millar and Koning (2018) state how, for instance, the United Nations Principles for Responsible Management Education initiative provides the space for integrating multiple disciplines in management education in order to foster a holistic understanding. Moreover, the literature emphasizes that there is an increasing demand to engage more management professionals who are competent in pluralistic and inter-disciplinary skills.

This demand is based on the fact that professionals recognize how many disciplines, such as computing, engineering, and life sciences, are involved in management and business practices today. Setó-Pamies and Papaoikonomou (2020) argue that an interdisciplinary approach to management education can help students understand the consequences of organizational decision-making. This approach can help business students obtain a deeper understanding of the causes of complex business issues. It will further lead to the development of modern approaches to problem-solving by integrating ideas, knowledge, and insights from different disciplines. For instance, there are many traditional approaches to managing organizations that are primarily focused on concepts such as organizational structure, strategy, or finance. However, complex problems in today's world, such as human rights, poverty, and climate change, cannot be effectively addressed by considering them from a single disciplinary perspective. That is why an interdisciplinary approach is required to fully understand the impact and solve these issues in business and management.

2. THE RISING NEED FOR INTERDISCIPLINARY APPROACHES IN BUSINESS

The complexity of the business environment today demands interdisciplinary approaches to conducting business. Organizations operate within a complex ecosystem of social, economic, technological, and environmental factors that contribute to the rapidly transforming global business environment. That is why professionals today need a holistic perspective when dealing with this complexity and everyday challenges. It is a perspective that goes beyond traditional disciplinary boundaries. Particularly, the need for interdisciplinary approaches is evident in fields such as general management and organizational behavior, where a single discipline may not provide a comprehensive understanding of the various factors that

influence organizational performance and effectiveness. By integrating knowledge, theories, methods, and perspectives from multiple disciplines, it is possible to provide more comprehensive and innovative solutions in management and business.

Additionally, professionals are aware that traditional disciplinary boundaries can be quite restrictive when dealing with complex and various business issues. They are searching for interdisciplinary approaches in business that can be introduced and are helpful in an everyday environment. Furthermore, there is a concept of transdisciplinarity, which emphasizes that the linear and static application of disciplinary approaches may not be sufficient to appropriately address interdisciplinary problems in organizations. Instead, organizations require a dynamic and iterative strategy that continuously adapts and evolves as new information and insights appear. A transdisciplinary approach enables a more in-depth examination of complex business issues by considering the interrelated connections among innumerable factors and stakeholders (The Right Way to Solve Complex Business Problems - Harvard Business Review, n.d). It is important to emphasize that the value of interconnecting existing research traditions and bodies of knowledge is recognized because researchers and practitioners can make new connections, identify innovative solutions, and contribute to the knowledge advancing in interconnected fields. All of these are possible by integrating insights and perspectives from various disciplines.

3. EVOLUTION OF INTERDISCIPLINARITY IN MODERN MANAGEMENT

In the literature, several factors have been observed that have contributed to the emergence and growing demand for interdisciplinarity in modern management and business. One factor is the growing complexity of business problems and difficulties (The Rise and Fall of Interdisciplinarity in Management Education, n.d.) (Robl & Bork, 2022).

As Akour and Alenezi (2022) state, traditional methods and disciplines may not be appropriate to fully understand and address challenges such as sustainability, digital transformation, and ethical concerns in business.

Integration of knowledge, theories, methods, and perspectives from multiple disciplines represents the basis for interdisciplinary research and practice to provide a more comprehensive understanding of the many different factors influencing organizational performance (Understanding interdisciplinary knowledge integration through citance analysis: A case study on eHealth, n.d.). This is why interdisciplinary approaches in management and business enable the investigation of new paths and the development of innovative solutions.

A transdisciplinary approach is important for addressing management and business issues where traditional approaches are limited. This is the situation when management and business issues are too complex, and this strategy emphasizes an iterative, dynamic, and responsive methodology that progresses throughout the research process, as opposed to the linear application of a single discipline's approach. Moreover, the growing interdependence of different global issues and the recognition of their impact on businesses and societies have contributed to the need for interdisciplinary approaches in management. By integrating knowledge and perspectives from many different fields, management professionals can develop a more comprehensive understanding and provide effective solutions. Another reason for the growth of interdisciplinarity in management and business is the awareness that interdisciplinary collaboration can result in increased productivity and innovation. It will bring a broader range of perspectives and expertise, resulting in more efficient decision-making and problem-solving. Diverse perspectives are needed in addressing complex

problems today, which is why interdisciplinary research and practice in management and business are of great importance.

4. IMPACT OF INTERDISCIPLINARY PRACTICES ON BUSINESS PERFORMANCE

The implementation of interdisciplinary management and business practices might have a significant impact and a number of positive effects on organizational and business performance. Firstly, according to Payne et al. (2011), interdisciplinary approaches foster a more comprehensive understanding of business challenges by integrating diverse knowledge and perspectives.

When using a single disciplinary approach, it is not possible to provide comprehensive decision-making and problem-solving processes, as well as the development of innovative solutions. Moreover, interdisciplinary cooperation can foster a culture of learning, innovation, and creativity within organizations. These approaches can moderate the exchange of ideas and some new insights, leading to the development of ground-breaking solutions by bringing together professionals from different fields. Especially interdisciplinary approaches in management and business have the potential to increase organizational flexibility and adaptability. By integrating insights and perspectives from many disciplines, organizations are able to anticipate and respond to changes in the business environment more effectively.

Businesses that can adapt and innovate quickly in response to market changes are more likely to succeed and obtain a competitive advantage. Cooperation among disciplines could provide a wider range of expertise, instruments, and funds, which would significantly increase the resources available to organizations and allow them to address more complex issues. In conclusion, interdisciplinary management and business practices have the potential to address societal issues and contribute to sustainable development. Professionals can make optimal decisions that take into account social, environmental, and economic factors by integrating knowledge and experience from different disciplines. It leads to the development of more socially responsible and environmentally sustainable business practices that align with the Sustainable Development Goals of the United Nations. Multiple studies have highlighted the significance of interdisciplinary approaches in management and business for addressing complex issues (Setó-Pamies & Papaoikonomou, 2020). For instance, human rights, poverty, and climate change are complex issues that cannot be effectively solved by following a single discipline. Therefore, the integration of interdisciplinary approaches in management and business is essential for obtaining a comprehensive understanding of these challenges and discovering suitable solutions. Additionally, it is essential that management and business education incorporate inter-disciplinary approaches. This will enable future managers and business leaders to acquire a broader perspective and the skills necessary to deal with complex and interrelated situations. The world is facing globalization and deregulation of industries, while innovation is continuously present. It creates an environment in which organizations must adopt interdisciplinary management strategies, where the components are related to forming multidisciplinary management teams and integrating cross-disciplinary conceptual frameworks. That is why contemporary management and business have developed interdisciplinary approaches as a response to the growing need for organizations to address complex issues and contribute to sustainable development.

5. CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING INTERDISCIPLINARITY IN MANAGEMENT

Starting the implementation of interdisciplinary approaches in management brings many obstacles and possibilities at the same time. The implementation of interdisciplinarity in management could be complicated because of traditional disciplinary boundaries and siloed thinking. Traditionally, many management and business structures have been organized around specialized fields like finance, marketing, and human resources. The integration of interdisciplinary approaches may require reconsidering traditional curricula. This can be difficult, as it may necessitate faculty members with expertise in multiple disciplines and may disrupt business schools' established teaching methods and structures.

Opportunities for interdisciplinarity implementation in management include encouraging innovation, developing problem-solving skills, and moderating cooperation. By adopting interdisciplinary approaches, management education can foster a more comprehensive understanding of complex issues and encourage the development of innovative solutions. In addition, interdisciplinary approaches can increase the capacity for problem-solving by combining diverse perspectives and knowledge from multiple disciplines. That is how interdisciplinary approaches will result in more exhaustive and efficient solutions to complex issues. Moreover, interdisciplinarity in management can facilitate cooperation within the business sector as well as with other disciplines. For instance, cooperation between business and computing can result in advancements in data analytics and technology integration, whereas collaborations between engineering and the life sciences can drive innovation in fields such as sustainability and healthcare.

5.1 INCORPORATING INTERDISCIPLINARITY IN MANAGEMENT EDUCATION

Introducing interdisciplinarity into management education requires a united effort to incorporate multiple disciplines and perspectives into the curriculum. It means that developing interdisciplinary programs or courses is one way to incorporate interdisciplinarity into management education. These programs can be developed to bring together professors and educators from different fields to co-teach and integrate their knowledge and expertise into the curriculum. In addition, interdisciplinary courses can be developed to expose students to different ways of thinking and encourage them to think critically and creatively across disciplines. Including interdisciplinarity in management education is also possible through interdisciplinary research projects and case studies. These projects can encourage students to apply concepts and methods from different disciplines to real-world problems, fostering a deeper understanding of the complexity of managerial decision-making.

Management education's interdisciplinarity can be improved by fostering collaboration between academia and industry. Establishing partnerships with businesses and organizations allows academic institutions to provide students with opportunities to work on interdisciplinary projects and gain experience in cross-disciplinary contexts. This collaborative approach can not only improve students' understanding of inter-disciplinary management but also empower them with valuable skills and professional networks for their future careers. Complex management and business issues require the integration of knowledge and skills from multiple disciplines. For example, sustainability, poverty, and climate change cannot be effectively dealt with by single disciplines. Therefore, an interdisciplinary approach is required to understand and address these complex challenges. Business schools are increasingly recognizing the importance of incorporating interdisciplinarity into their management education programs in order to address these

challenges. This recognition has resulted in the development of interdisciplinary programs and courses designed to provide students with a comprehensive understanding of management principles and practices. These programs and courses in the field of project management include Project Management in the Healthcare and Project Management in the Public Sector, among others.

Today, the world is facing an emergency and an increasing demand for interdisciplinarity in contemporary management and business. It can be observed as the result of many factors, like globalization, deregulation, and continuous innovation. These factors have increased the complexity and interrelatedness of business environments, requiring that managers offer a wide range of competencies, skills, and knowledge. The development of interdisciplinarity in contemporary management and business is a response to the need for an all-encompassing understanding of complex issues and challenges. This requirement resulted in business schools and colleges initiating ongoing dialogue among managers and professors in order to develop and support new interdisciplinary programs. These programs aim to equip students with the ability to integrate cross-disciplinary conceptual frameworks and generate novel knowledge applications. Moreover, students' critical thinking and problem-solving skills can be improved by introducing an interdisciplinary approach to management education. They will be capable of approaching issues from a variety of angles, analysing complex situations, and developing innovative solutions. In addition, interdisciplinary management education equips students with career-enhancing skills and networks.

5.2 INCORPORATING INTERDISCIPLINARITY IN MANAGEMENT RESEARCH

In addition to the importance of interdisciplinarity in management and business practice, it is also highly relevant in research. The traditional disciplinary framework in research frequently disrupts the capacity to address complex and interrelated issues. To overcome these limitations, interdisciplinary research is increasingly recognized as necessary. For a comprehensive understanding of complex phenomena, interdisciplinary research requires the collaboration and integration of knowledge and methods from multiple disciplines. To overcome the limitations of their disciplines and comprehensively address contemporary environmental issues, scientists are increasingly adopting inter-disciplinary approaches in their scientific endeavors. (Moore, et al., 2009). According to Boonstra et al. (2015), for identifying policy and management priorities when facing global environmental changes, interdisciplinary perspectives are essential. Interdisciplinary research in management and business enables a more comprehensive understanding of the challenges and complexities with which organizations are faced. This strategy enables researchers to identify novel science questions that reach multiple disciplines and to develop innovative concepts and methods to answer complex research questions (Walker et al., 2015).

The need for interdisciplinary research in the fields of management and business is supported by the awareness that a single disciplinary approach cannot effectively address many contemporary issues. Issues such as sustainability, ethical dilemmas, and innovation, for instance, require the integration of knowledge from multiple disciplines, including economics, environmental science, psychology, sociology, and ethics. Interdisciplinary research in management and business can provide comprehensive insights into complex issues, develop innovative solutions, and contribute to sustainable development by combining multiple disciplines. Sustainable development requires interdisciplinarity in management and business practice in order to address its complex challenges. In management and business, interdisciplinary approaches also permit a more inclusive and diverse perspective.

6. FUTURE PERSPECTIVES: THE INCREASING ROLE OF INTERDISCIPLINARITY IN PROJECT MANAGEMENT

Interdisciplinarity is expected to play an increasingly important role in the field of project management, in addition to its current importance in business and management education. According to Pidgeon and Dawood (2021), as projects become more complex and have many different aspects, the ability to draw on a variety of disciplines becomes essential to ensuring project success. By incorporating interdisciplinary approaches, project managers can draw on a variety of perspectives and areas of expertise to overcome obstacles and develop novel solutions. This could result in improved project planning, resource allocation, and risk management. In addition, interdisciplinary cooperation can assist project managers in gaining a more comprehensive understanding of the project's impact on various stakeholders and the larger ecosystem. This comprehension can result in more environmentally and socially responsible project outcomes.

In the field of project management, an interdisciplinary mindset is becoming increasingly acknowledged. This is due to the fact that projects frequently involve multiple stakeholders with diverse perspectives and interests, requiring project managers to navigate complex social dynamics. To effectively address these obstacles, project managers can benefit from following ideas and insights from different disciplines, including psychology, sociology, and organizational behaviour. The integration of interdisciplinary perspectives can assist project managers in understanding and managing team dynamics, enhancing communication and collaboration, and addressing potential conflicts or ethical issues that may arise during project implementation. In addition, an interdisciplinary approach can contribute to the development of ethical frameworks for business management decision-making.

Project managers should make morally sound decisions that align with the organization's and society's core values by considering ethical principles from fields such as philosophy and applied ethics. In addition to improving project management practices, innovation and creativity within organizations can be fostered by the integration of interdisciplinary approaches. By incorporating insights from disciplines such as design thinking, innovation management, and entrepreneurship, organizations can foster a culture of creativity and encourage employees to think creatively, leading to the creation of innovative solutions and the identification of new business opportunities. Moreover, adopting interdisciplinary approaches in project management can aid in addressing complex societal issues and contribute to sustainable development. The integration of disciplines such as environmental science and social sciences, for instance, can provide valuable ideas and insights for the impact of organizational activities and processes on the environment and society. This knowledge can provide better information for decision-making processes, resulting in the implementation of more sustainable practices and the mitigation of potential unfavourable effects on the environment and local communities.

Managers and project teams must develop an interdisciplinary mindset in order to effectively implement interdisciplinary approaches in project management. This can be achieved in many ways, for instance, by providing opportunities for interdisciplinary education and training, fostering cooperation and communication among different departments and disciplines, developing platforms for knowledge sharing and knowledge exchange, and encouraging an openness to diverse perspectives and ideas. As an illustration, the International Project Management Association (IPMA), the world's oldest project management association, has been establishing a number of Special Interest Groups (SIGs)

cantered on specific applications of project management, representing an interdisciplinary approach to the contemporary project profession.

Effective project management practices can encourage the development of inter-disciplinary teams. This may involve defining project goals and objectives that require contributions from multiple disciplines, deciding about team members with diverse professional backgrounds and expertise, fostering a collaborative and inclusive team environment, and providing resources and support for interdisciplinary cooperation. Moreover, businesses can benefit from interdisciplinary approaches by securing access to a wider range of knowledge, experience, resources, and perspectives. The rising demand for interdisciplinarity in contemporary project management is driven by the awareness that complex issues and sustainable development require an approach that goes beyond traditional disciplinary frameworks.

7. CONCLUSION AND NEXT STEPS

In conclusion, the involvement of inter-disciplinary approaches in management and business is motivated by the need to address complex issues and promote sustainable development. Businesses and academic institutions acknowledge that interdisciplinary approaches in their programs offer a broader perspective, access to a variety of expertise, and the capacity to generate innovative ideas and solutions. Organizations and educational institutions must continue to prioritize the development of interdisciplinary skills and knowledge. This can be accomplished through ongoing dialogues among business professors to develop new interdisciplinary programs, collaborative teaching methods that integrate cross-disciplinary conceptual frameworks and develop new knowledge, and the promotion of interdisciplinary research in business schools. Future managers who recognize this opportunity will be better equipped to navigate the complexities of the modern business world and drive innovation within their organizations. Globalization, deregulation, and continuous innovation have required the adoption of a multidisciplinary approach in managerial systems in order to operate. It is a multidisciplinary strategy that includes developing management teams consisting of individuals with diverse professional backgrounds and fields of expertise. These teams will be able to deal with complex issues and promote a cooperative and inclusive atmosphere in which team members are able to develop innovative solutions. Interdisciplinary approaches have also gained support in the context of business education.

Organizations that are primarily focused on projects must actively seek out opportunities for cooperation with other disciplines, particularly in the sciences. This partnership is crucial because it can provide solutions to complex business issues and contribute to sustainable development. To address the challenges posed by globalization, deregulation, and continuous innovation, organizations must involve a multidisciplinary approach and develop management teams with diverse backgrounds and perspectives. Academic institutions have recognized this need and initiated open communication among business professors to develop interdisciplinary programs that integrate cross-disciplinary frameworks for students. This collaborative teaching method is going to improve the education system and encourage the development of innovations. Additionally, an interdisciplinary approach to business education would allow students to gain a deeper understanding of the implications of organizational decision making. Prior research has emphasized the significance of interdisciplinarity when addressing complex issues, such as poverty, human rights, and climate change, that cannot be addressed by a single discipline.

It would be of the utmost value if scholarly efforts from business and non-business schools went beyond disciplinary frameworks when considering business and management issues. It is essential to achieve a balance between disciplinary expertise and interdisciplinary research in order to provide profound understanding and insights into complex issues. The teams should consist of professionals from different professional backgrounds and fields of study, such as business, computing, engineering, and the life sciences. This interdisciplinary approach would enable professionals to address complex issues from a holistic perspective by integrating knowledge from different disciplines in order to create innovative solutions.

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WHY BELT AND ROAD INITIATIVE WORKS? TEN YEARS AFTER

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Abstract: The paper provides an insight into what the Belt and Road Initiative represents, how it was born, its purpose, and the action plan of the Initiative. The Initiative was introduced in 2013, and its purpose was economic development. In China, they said, if you want to get rich, build road first. Therefore, it is considered important to build infrastructure and support economic development. The Initiative reflects the national comparative advantage of China in its infrastructure development sector and corresponds to a third stage in the openness of the Chinese economy to the world.

Keywords: Belt and Road Initiative; Project management.

1. INTRODUCTION

The birth of the Belt and Road Initiative was not a grand plan but rather a reaction when Wall Street put the world into the global financial crisis in 2008, which had a negative impact on the world. In order to counteract this negative impact of the global financial crisis, China took action, and the Chinese government put aside 4 trillion RMB of funds to invest in infrastructure to keep the economic growth of China and to balance the world economy on a sleeper road. To some extent, that 4 trillion RMB of investment played a very positive role. Still, those were stimulant measures, and when the crisis gradually died out, the investment, the capacity, and the teams needed to find a proper and sustainable use of the capacity. That is why the Chinese government and companies consider that there are many other countries, particularly developing countries, that need infrastructure that is essential for sustainable economic growth. That is why it was called the Belt and Road Initiative. Ten years ago, in 2013, President Xi made two speeches. One is at Nazarbayev University at Kazakhstan, a great platform to make such an announcement, where they called it the Silk Road Economy Belt. On another occasion, later that year, President Xi made another speech in Indonesia, one of the founding members of the North Atlantic Movement. President Xi proposed to launch the 21st century maritime silk road, which combined the two initiatives into the Belt and Road Initiative. That was the moment when the initiative was born.

2. THE PURPOSE OF THE BELT AND ROAD INITIATIVE

From China's perspective, the Initiative was a third stage in the openness of the Chinese economy. In the first stage, China transitioned itself from a centrally planned economy to a market-oriented economy, from an agricultural-based economy to an industrialized-based economy. The question was how to make the transition via an open-door policy. Some foreign direct investment that invested in China brought technology and management skills to China. After the first phase, when China's economy moved to the second phase, China joined the World Trade Organization and greatly integrated into the world economy. China became part of such an economy. The Belt and Road Initiative represents a third phase of openness. In this phase, China's developed capabilities and knowledge were used to make the world more sustainable.

The Belt and Road Initiative integrates the economy in Eurasia. There are two major lines that go from Beijing to Ulaanbaatar, Moscow, Bucharest, and Germany. There is a line that goes through Central Asia to Ankara, Istanbul, and this part of the world. The motive for this

initiative was to counteract the impact of the global financial crisis and to construct infrastructure for a new round of globalization that needs this movement of goods, people, and commodities. That is the construction of infrastructure for the new world, it is international and includes capacity cooperation with developing countries.

As Wu (2011) stated, we are witnessing how globalization forces have reshaped the landscape of the world economy to a great extent in the last three decades. It creates an environment where companies from developing countries often start looking for investment opportunities across national borders and experience rapid growth. There are also very strong components to the collaboration among countries around the world. For example, Germany has good infrastructure, and then China signed a memorandum with Germany, to explore third countries that do not have the same high standard of infrastructure as Germany and China and to combine all forces for the next phase of economic growth. That is how this initiative provides sustainability for the global economy.

After President Xi introduced the Belt and Road Initiative in 2013, the National Development Reform Commission and Ministry of Foreign Affairs and Ministry of Commerce of China published a white paper in 2015. That paper had a vision and action plan for the Belt and Road Initiative. This action plan included five key components. The first one is the connectivity of the infrastructure. The Belt meant that a road had to be built, as well as a port, a rail line, and power plants. Moreover, because it is an international trade, the trade road, the Silk Road, and other roads need to be connected, which is the second component. These trade roads need to be new and develop connectivity. The third component is finance. In order to do these things, money and funds are needed. The question is how to generate and mobilize these funds from rich countries to mid-income and low-income countries, and how to mobilize this connectivity with the capital market? The answer is people. People need to communicate, to understand each other, and to put aside the suspicious. The fourth component is communication and people's connectivity. Different countries have different kinds of policy initiatives, and there are different blocks in the world. There is Russia and the Asian continent with some kind of economic integration, and Europe has a different kind of coordination scheme. That is something that is important to work out, and that is the fifth connectivity. India and Pakistan have their own plans as well.

It is also important to talk about digital information and communication. The digital gap between developed and developing countries needs to be erased. During COVID-19, a lot of efforts were put into the initiative to tackle that global crisis, as Chukwu and Zubairu (2023) confirmed. It is important to understand that the Belt and Road Initiative is not only roads and bridges, not only the port, but much more that is connected with the policy initiative coordination and people who need to understand what is behind the initiative. There are several international economic corridors, where are China, Mongolia, and Russia, then the New Eurasia land bridge, then China, Central Asia, Western Asia, Bangladesh, China, and India, and of course China and Pakistan. These are different projects, and it is important to talk about project management. For example, China and Pakistan economic corridor is a \$46 billion project. It is a big project, and it is very important how to manage this project. Initially, the plan was that the Initiative would include 64 countries, but when it was launched, many other countries wanted to join, from Argentina to South Africa.

3. CHALLENGES IN TEN YEARS OF THE BELT AND ROAD INITIATIVE

China has signed more than 200 documents with more than 150 countries and international organizations from 2013 until now. There were many projects in thousands that were realized, which created jobs and other benefits. Partnerships with the advanced economies, such as Italy, Germany, and France, were of great importance because those countries have very advanced engineering skills. When it comes to how these projects have to be realized, French companies, for example, provide engineering design and, in partnership with Chinese construction companies, turn this into reality. This can be considered a win-win result. The fact is that we are living in a competitive world. Ahlstrom et al. (2018) stated that a strong incentive for being adventurous and innovative was provided when a large economy like that of China grew so fast.

When China launched the Belt and Road Initiative, there were many competing proposals on the table. One of them came from the European Union, which, as an alternative, wanted to invest 300 billion euros in infrastructure projects in developed countries by 2027. Also, as an alternative, the United States proposed starting a leadership, when US President Joe Biden proposed B3W (Build Back Better World) where 40 trillion US dollars were needed for the infrastructure. China wanted something different and better. China considered climate, health, healthcare, digital technology, and all that with equality, as well as some other concepts like social development concept. A global need for infrastructure investment, particularly in developing countries, is huge. It means that the bridges and tunnels need to be built, the ports need to be constructed, and the main questions are who is going to do that and who is going to build a rail link. These infrastructure projects are not only about the money. The people are important, for example, engineers need to take care of the plans.

Michael Porter published the book "A Comparative Advantage of Nations" in 1990. He explained why some nations are more competitive in certain sectors than others (Porter, 1990). There is a concept of comparative advantages, and every nation has a comparative advantage, but Michael Porter did not write about a comparative advantage. Porter's model, the diamond model, has four components: factor conditions, demand conditions, related and supported industry conditions, and firm strategy, structure, and rivalry. In addition to that, he proposed opportunities and government initiatives and explained that they make nations more competitive than others. The factor conditions encompass labor forces, the capital market, and other elements. When we speak about demand conditions, for example, in China 30 years ago, China's infrastructure was very inferior, and there was no highway in China. The demand conditions gave Chinese companies some opportunity to develop. Of course, the factor conditions with labor forces, engineering, and other elements were present. The other two components of the diamond model were related and supported industries and firm strategy. All these were important for China's own development in infrastructure as a need that trained up the capabilities of companies.

For the purpose of explaining this to international audiences, it is important to link these facts to academic modeling and to use mainstream business economics to explain it. The railroad initiative needed a leader, and that was President Xi, who said to start the railroad initiative. In China, there are 5 million kilometres of highways in the process, and there is a need for companies and engineers to do this, as well as project management to plan it. It makes a capability. Moreover, there are 150,000 kilometres of railways and 40,000 high-speed trains with 350 kilometres per hour. That is why Chinese companies are so competent. The next important topic is power plants. The high-speed trains do not have engines. They are relying on high-voltage electricity supply, so there is a huge demand for electricity supply. Keeping

in mind that there are also 20867 ports, it means that 10 to 20 years of cumulative knowledge, skills, and experience make Chinese companies almost unbeatable. When they do something many times, they know they can do it in different places. That is the capability. That is the national capability of China. When these companies do business in another country, they explore opportunities for collaboration with the local companies. It is important to understand that highways can be built, but with no industrialization and no employment, the highways are useless.

The Belt and Road Initiative has a certain advantage in finance. To provide the advantage, China first initiated the Asia Infrastructure Investment Bank, and the first country to join and invest money was Great Britain. Luxembourg and Germany joined as well, and they turned out to be financial institutions larger than the World Bank. Also, there is the BRICS Bank (Brazil, Russia, India, and China). With these funds and the management and technology labor force, the Belt and Road Initiative has a better chance in comparison to alternative programs, and it is also sustainable. When Chinese companies operate in some countries, the question is how to sustain their comparative advantage in infrastructure construction. It is an important question because they need to beat up, in a comparative sense, companies from Turkey, Italy, India, and other countries. The comparative advantage of the Chinese companies is that they have very good core competencies, are good at project planning, have very skilled teams, and are globally looking to find opportunities.

Today, many developed countries want to learn from China's experience, not only in infrastructure development. China expands itself by investing in infrastructure, which makes this economy's model easier to learn and apply. The Belt and Road Initiative is the program that brings the development path of developing countries closer to reality. It is important to understand that 40 years ago, China was 20% poorer than India. Now, China is five times as rich as India. The story was that China, of course, invested in education while also developing better infrastructure in some way. Of course, there are some sectors where China may not have a comparative advantage and is not economically motivated. But when China is economically motivated, then China's companies, management teams, and project financing can provide real results in minimal time and in a cost-efficient way. To put the Belt Road Initiative to work, there is a need for a clever business model. In order to prevent potential failures, the faculties should provide training to the managers, give advice to companies, and invent some value-adding, sustainable business practices to make the world a better place.

4. CONCLUSION

The Belt and Road Initiative has integrated the economy in Eurasia for the last ten years. The Initiative confirms that China has a national comparative advantage in its sector of infrastructure development. The world is facing some deeper relations in a multi-polar world with the two largest economies, China and the United States, but the Belt and Road Initiative is not intended to be politically motivated. There are eight billion people in the world, and these industrial countries represent a relatively small percentage country-wise. Of course, from an economic power point of view, that is a larger share. It is important to understand that geopolitical conflicts would not hinder or destroy the Belt and Road Initiative, even if these major blocks (China, Europe, and the US) wanted to counter the political influence. The Initiative is present in Sri Lanka, Ethiopia, Argentina, and other developing countries that need infrastructure, and Chinese companies are strong in infrastructure sectors. These countries are the main beneficiaries. When those countries develop such infrastructure, their sustainable economic development will indeed be sustainable. Then, in the longer term,

globalization would only strengthen instead of halting. Once a developing country has highways and a port, it will need an industrial park or a science park. Building roads or completing roads themselves are not deliverables. Then it will attract multinational companies to invest there, generate employment, and train the labor force, and these are real deliverables that will help the country to become mid-income country. It can be considered the next phase of globalization.

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BELT AND ROAD INITIATIVE: BUILDING PEOPLE COMPETENCIES FOR PROJECT MANAGEMENT

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Abstract: The purpose of this paper is to present the project that significantly contributes to micro-map of the Belt and Road Initiative. Knowing the purpose of Belt and Road Initiative, the question is how to support this initiative. To construct the loaded Belt Initiatives, the money is not the only essential element or component. The most important factor if you want to make the Belt and Road Initiative happen as we expected is people. The paper presents the project in education, to have qualified people to support the Belt and Road Initiatives. Using a case study method, the paper introduces the road map of developing education program, from the government level to the university level, study program, university staff and students.

Keywords: Belt and Road Initiative; Education; Project; Project management; People.

1. INTRODUCTION

Considering the Belt and Road map the main question is how to have qualified people to support the Belt and Initiatives. People competencies and qualifications have been seen as a crucial for building future together. An education become very important segment of Belt and Road Initiative (Jiang & Shi, 2019).

In 2013, the same year as President Xi proposed the Belt and Road Initiatives in the University of Kazakhstan, we made our first visit to Africa for an international education exhibition. The exhibition was organized with Ministry of Education in Tanzania to discuss what kind of talents the developing countries wanted the most. The question was what is the difference between the developing countries and the developing countries? The first impression was that it depends on how many projects we are doing every day. Comparatively, in developed countries we have few projects or much fewer than the developing countries. Therefore, there are a lot of projects doing in developing countries or, in other words, the developing countries are supported by a giant number of projects. Consequently, we are ultimately in short of project management professionals in developing countries. So that's why we started this international program on project management, a master's degree programme. The purpose of the paper is to present an education program developed in Shandong University to provide qualified people for Belt and Road Initiative.

2. INTERNATIONAL MASTER PROGRAM – CASE FROM CHINA

This chapter provides an International Project Management program mission, and the milestones of an integrated education systems, and what kind of system we are doing to support this education program, as a case from China. The mission was discussed with the Ministry of Education in Tanzania, to where we should send people to learn, and develop themselves.

Two options were identified. One is to send them to the advanced developed countries such as the United States, Germany, Italy, or UK, as developed countries. The other is to send them to the most advanced developing country, China. We proposed to select the latter one. There is a belief that a person cannot learn before he is able to work. For the undeveloped

countries or developing countries, we cannot afford money and time, especially time to put most of our young people to learn from well-developed countries, especially in applied domains such as management etc. Because there is a so big gap between the developing countries and the developed countries. Therefore, the mission for our international program is to give the opportunity for the young talents around the low-developed countries and territories to find more competence to develop their own life and to support their country's development. It was a basic consideration for setting this international education program.

We have started since 2013, just after President Xi proposed the Road and Belt initiative. There are several milestones that will be introduced. We started our global project management education in 2013. Now in China, we have only eight universities on project management accredited by PMI's GAC. We call top universities such as Tsinghua University, Shanghai Jiaotong University, and other universities, that are well influential universities. The intentions to prove our education on government is on the same level as the world's most advanced system (Li et al., 2019). The reason why young talents from low-developed territories, should study in China, since China's universities can invite the professors from developed countries to China and make China a education hub for different countries.

The next year (2014), we got the International Project Management association (IPMA) certification system. IPMA is the oldest and largest project management professional association in the world. It was established in 1965 with 72 member associations located in five continents. It means our students, when they get their diploma or they finish their courses, can just apply for the certificates directly, especially for the PMA level D certificates. To emphasize, students don't need to take some extra exam or tests. The first enrolment was in 2015, we only had five people. This means that it was not easy to initiate an international education program. If you want to do something to make something different happen, it's not easy, especially from zero to one. But we insisted on keeping this program. The next year (2016) we have 15 internships, all the big companies for this program, all are world-recognized big companies, such as China State-owned companies.

The companies can provide some internships, cases, even scholarship for the international students. On the average, one student in our program has four offers from different companies. They want to provide them internships in different industries - construction, IT, and maybe investment or other things. In 2019, we got an Excellent Education Program Award from Project Management Institute (PMI) China. PMI is another international project management association with most influence as IPMA in the world. It was established in 1969 in the United States.

At the beginning, we had only eight people who applied for this program. But we selected five. One of the students, when he was still in the courses, after one year in this two-year program, was recruited by the government of Tanzania to be a project manager. He had to tell his country, I still had one year to stay in China to learn. The government answered: "we'd like to keep this position for you for the next year". It's a case how well accepted this program by developing countries.

In 2017, we have more than 100 applicants, qualified applicants. We selected about 25. It's just a good size for a class. And the number is kept almost stable until 2019. So even in the last three years, because of the COVID-19, we still have almost 20 students online in one class. Many students are in the developing countries, they have not so good quality internet, and this presents a big challenge for us. To deal with these issues, maybe we will consider

how to give them more chance this year. Now we have students from 36 countries, almost half of them are from territories of the Belt and Road countries, most of them are from Asia. Why we have so many students from Asia? Because where there is a Chinese project, there are international students. It's our philosophy, our education should go with the same step with the projects. Where there is a project, there are our students. It's our basic strategy. Africa is the second largest (King, 2020). Of course, we have also several students from the United States. Therefore, this is an integrated education system. In the governance of this program, basically, we have universities, industries, companies, and governments. At the beginning we needed government to support us with scholarship. And we have a university consortium to support this program, it's not limited to Shandong University itself.

The professors on this program are from different continents. For example, a very famous professor is Dr. Rodney Turner, he is also in our teaching team. He teaches the students about recruitment and contract management/project governance. And we have a very small but very effective international staff team to promote and to take care of the students living there in China.

In this education program, companies are playing more and more important roles. It's a unified system - professors, staff members, students, and governments, enterprises, and universities, where students are in the center. Students are the core of the system.

3. INTERNATIONAL MASTER PROGRAM – NEXT STEPS

What are the next steps we want to do? They are to continue with research, and cooperate with companies (Ram, & Ronggui, 2018). In our education program, we will provide students with real project cases from the beginning of their study to the end. Students are separated in different groups. Each group will give a real project case, students can learn and simulate from the basic conceptions to the tools, methods, approaches, to manage the projects. We are inviting companies, the real project managers, to the classrooms to share their experience, to find the difference from the classroom and the real society.

We will cooperate with different university professors. That's why we think cooperation with Serbian universities can contribute to this (Ivetić & Ilić, 2020). One of our objectives is to cooperate with the University of Belgrade. It is possible to set a joint teaching team to share different ideas. In Europe, there is a program called MSPME (Master in Strategic Project Management European). Every year, they will invite some professors outside of Europe to share different cultures to make the students to understand the diversity in the world. We will do the similar jobs or even more, to develop some racing system to provide more online courses and other ways to deliver the knowledge and deliver the experiences for students.

We will attract more sponsorship for our students and to develop our facilities. We will set some joint or dual degrees to increase our competition. And we will invite joint advisors from companies and provide career service for students. The international program is a two-year program. The first one year is to study on campuses. And the second year, the students will go to different companies to practice.

4. CONCLUSION

After elaborating process of master program development, it can be said that when starting a new program we need a promotion, on the other hand we don't want to recruit too many students at the beginning, especially the first five years. We need to test what is the most suitable for the students, and for the companies, because the companies want the further project managers to stay locally to operate the projects.

Belt and Road Initiative implies collaboration. We want to support the companies, projects or the countries to develop together with our students, and vice versa. So it's a kind of advantage of China, because the policies of Chinese government are stable. China never fights with other countries because in Chinese culture harmony is rich. We can never give an example, one country make a disaster because they do business with Chinese, neither in Chinese investment nor in international education programs in China.

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INTERDISCIPLINARY PROJECT APPROACH OF SMART TECHNOLOGIES IN COMMERCE: SMART SHOP CONCEPT

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Abstract: The growing dynamic of information technology development and its application in all spheres of society dominantly affects the economy, specifically commerce. Technological solutions based on IT solutions are framed in common platforms called "smart" concepts, which are functionally integrated into existing business models. Applying smart concepts in the different levels of trade business leads to the creation of smart commerce. Based on the literature analysis, the paper critically approaches the establishment of general determinants of the smart shop concept. The smart commerce concept is analyzed interdisciplinary through the technical-technologically, socio-economic, and socio-psychological aspects. Based on the existing model applied in the smart kiosk case study, the paper establishes a correlation between general determinants and their application in developing a specific product as a model of application of smart technology in commerce. The case study indicates that a business-sustainable integrated interdisciplinary application of IT technologies in commerce is possible, with adequate management approaches, especially in developing client relations, constantly improving offers and service development, and adapting the work of Smart Kiosks to their needs.

Keywords: smart shop, IoT, commerce, retail, digital economy, consumer relations.

1. INTRODUCTION

The current business environment is focused on digitalization, automation, and the introduction of smart technologies based on the IoT vision of society. Modern retail trends impose the necessity of user interfaces compliant to the needs of industry and users. The trend of automation of the trade process, entitled a "smart shop" or "smart shopping," is evident. In the current academic and expert literature, smart trade or smart shopping is predominantly observed through various forms of application of digital technologies in certain phases of the retail process. Under smart shopping, most of the authors are usually concerned with certain parts of the process of buying in retail which have some correlation with digital technology. The typical approach in the contemporary analysis is focused on Internet commerce, speeding up the payment of goods (Borse et al., 2018) and identification of goods (Ayoola et al., 2019) by finding the shortest route to goods (Budakova & Dakovski, 2019).

There needs to be a definition of the smart shop determinants as a comprehensive concept. Namely, the retail process is burdened with numerous problems affecting the company's final business: lack of staffing, limited working hours, inefficient loyalty programs, queues, no advanced sales, inventory management, procurement, and logistics. All the above reasons, which include technical technology and socio-economy, and interdisciplinary behavioral approach, point out the necessity for determinants of smart technologies in commerce.

2. THE CURRENT UNDERSTANDING OF SMART SHOP CONCEPT

The new Oxford Dictionary defines a "smart shopper" as "modern and market-leading; possessing or demonstrating smart intelligence; capable of independent and seemingly

intelligent action" (Oxford Dictionary, 2006: 1757). The broader approach states that "smart shopping" is a search performed by the buyer, intending to find the trader who offers the best based on precise, essential criteria for the buyer. The main criterion is the one according to which the buyer most wants to optimize the purchase process. This search is performed on as many retailers as possible to achieve a more extensive product offer." (Reformat, 2013:167). Smart shopping is also a social and rational category, as a consumer reaction to some market or financial turbulence. (Reformat, 2013).

Nevertheless, smart shopping is even more than a social category and enters the field of psychology, economics, and technology. In numerous scientific papers, smart shopping is identified as 1) The reaction of customers to certain dissatisfactions and frustrations that have arisen due to the long process of buying (search, identification, selection, payment, access to use) (Ayoola et al., 2019); 2) Possibilities of easy visual recognition of the desired goods (Yuan, Orlowska, & Sadiq, 2006; Ali & Sonkusare, 2014; Megalingam et al., 2019); 3) Efficiently organized payment based on the recognition of goods (Borse et al., 2018); 4) Designing concrete and actual desired services (Giusti & Zancanaro, 2010), or 5) Online Internet shopping (Niemann, Mochol & Tolksdorf, 2010). Overall, the smart shopping concept is IT support to retailers to adapt to the new social needs of consumers.

Moreover, the smart shop concept is in conjunction with market conditions, the dynamic of IT solutions, and complex psychosocial relations and has growing economic and social significance. According to the estimates presented by the McKinsey Global Institute, the potential economic impact of IT and the Internet of Things (IoT) by 2025 will be between 2.7 to 6.2 trillion US dollars annually. The most important categories of IoT technologies include "smart" user technologies, portable and easily accessible applications for trade, "smart" production, infrastructure technology, and crewless transport (Castillo & Thierer, 2015).

3. GENERAL DETERMINANTS OF THE SMART COMMERCE CONCEPT

The analysis of the application of information technology in modern trade with retail orientation is based on a comparative analysis of the complementarity of current socio-economic problems in the mentioned process of trade and development information technologies.

3.1. SOCIO-ECONOMIC AND PSYCHOLOGICAL CHARACTERISTICS OF THE MODERN TRADE ENVIRONMENT

Smart shopping is mainly related to the purchase process followed by smart customers (Labbé-Pinlon et al., 2011). The modern customer is demanding and strives to achieve the efficient, economic, and quality realization of their needs in the shortest possible time. Such needs in the constellation of modern technologies in the retail process determine the customer as a smart shopper. The main feature of a smart customer is that in addition to the orientation on the price-quality ratio, where the price is set as the dominant motivating element of the marketing mix (Lichtenstein, Ridgway & Netemeyer, 1993), bases its purchasing decision with profit maximization based on the shopping experience (Atkins, Kumar & Kim, 2016). The smart shopper is a consumer who plays considerable effort into finding and using information related to article promotion to make the best possible and rational purchase (Mano & Elliott, 1997). In addition to efficient shopping, the smart consumer strives for self-confirmation and expression of individual personal creativity in shopping, allowing him to express and confirm himself as an active and creative subject of the shopping process (Bicen & Madhavaram, 2013). For modern smart customers, achieving a good shopping arrangement

is a source of positive emotions that create a sense of self-fulfillment, positive emotions of pride, and overall psychological empowerment. (Schindler, 1998).

Contemporary time is the era of innovation, in which the consumer and the development of relationships with him are the central goals of marketing activities (Taillard & Mitrović, 2020). A special relationship is dedicated to structuring the needs and requirements of consumers concerning the overall characteristics and offers of the sales facility and the offered items. In summary, technological innovations affect customers' habits and needs, leading to the development of trade management and marketing (Mitrović & Vulić, 2019). Technology through customer development directly influences supply and demand management, further affirming retail's original interests even more complex (Petković & Bogetić, 2014). Increasing segmentation of customer requirements raises the necessity of an adequate retail response, which will make an increased effort to meet the stated requirements (Bogetić & Petković, 2014). This correlation IT – customer – retail – business effects, significantly affects the management aspects of modern, smart trade. Innovations in technology applied in modern retail, condition an innovative approach in relationship management and development (Mitrović, 2019), communication with the consumer, focused on needs and requirements (Bogetić, Petković & Stojković).

In summary, one of the effects of introducing the smart shop approach to retail shows the economic and social transformation of conventional trade on consumer behavior. The main effects that stand out in the interaction of smart shop devices and users are time and money savings, accurate procurement, the effective smart machine - customer interaction, gender and age customized product offer (Atkins & Hyun, 2016).

3.2. INFORMATION TECHNOLOGY ASPECTS OF A SMART SHOP TRADE

Modern digital services applied in economic relations are mostly identified as e-commerce. The term originated as an abbreviation of electronic commerce and represented selling goods or services through electronic communication channels, predominantly the Internet. Today almost all products and services can be sold electronically, and the largest and most famous e-retailers in the world are Amazon, Alibaba, Best Buy, and eBay (Krstić, 2017:51). This approach highlights the need to protect the security of digital applied models (Vulić et al., 2022).

The characteristics of e-commerce are flexibility, cooperation, and high speed of interactivity. The digital economy leads to quickly reorganizing the company's resources and creating new values and business models that meet increasingly demanding consumers' needs (Đorđević, 2007).

The dominant influence on the development of modern trade with interaction with urban life represents the Internet of Things (IoT) as a concept where objects of daily use, people, or other living beings are connected to the Internet. The concept is based on the connection of things (subjects), with identification by Internet address protocol - IP address. Entities in such a system can independently transmit data over a network without human or computer support. The concept was created due to the combination of wireless technology, micro-electromechanical systems, and the Internet (Krstić, 2017:64). The growing application of digital technologies, especially developments in IoT, has encouraged the growth of interest in their application in smart services. (Georgakopoulos and Jayaraman 2016).

These elements represent the basis for establishing the core determinants of smart shopping and developing applied and adapted forms of smart shop models. The application implies that the basic principles of the concept of smart trade are adjusted and applied to specific perceived critical problems in trade in goods and services based on the principle of responding to the observed socio-economic demands and issues. This approach represents the development of interdisciplinary organizational business models, new relations between the business and customer (B2C), and customers to business (C2B) (Reformat, 2013). Furthermore, new relations lead to a foreseeable investment in smart services within the trade based on "machine-to-machine" (M2M) relations (Castillo & Thierer, 2015) and the development of personalized and customized communication with a specific category of user.

3.3. SMART SHOP CONCEPT DETERMINANTS

Considering the current approach to the phenomenon of smart shopping, specific determinants stand out, which can be divided into three basic categories:

- Technical - technological: IoT, machine learning, e-commerce, digital economy;
- Socio-economic: human resources, legal, economics, inventory, procurement, marketing, advertising, loyalty;
- Socio-psychological: satisfaction, sense of uniqueness and actuality, active participation, communication, adaptation, relationship development.

4. CASE STUDY -"SMART CORNER SHOP" APPLICATION OF THE SMART SHOP CONCEPT

The form of retail as a corner shop (in Serbian "kiosk") is very popular in Serbia and enables the development of an efficient and successful business model based on the smart shop concept. The starting point for the analysis of the case study is the research of the company ASC, which deals with applying the concept of smart trade and service in various business forms.

By this analyses general characteristics of retail in "kiosk":

- 1) Limited type and range of offer;
- 2) Strong influence of the micro-location and habits of customers;
- 3) Mostly individual and occasional purchases;
- 4) Many sales facility units, variable engagement of sales capacities.

4.1. PREVIOUS PROJECT RESEARCH

The research was conducted on the small, medium, and large companies that dealt with the "kiosk" business in the first half of 2019 on several Belgrade municipalities' territories. The research covered the following aspects of business: human resources, turnover (cash flow), and the range of goods for which there is the most significant demand. The general conclusion is the permanent shortage of labor. Despite the constantly open job vacancies, there is a chronic demand for thousands of workers.

Turnover depends on general and unique locations, part of the day, year, week, the number of competing kiosks, offer of goods and services. In addition, there are challenges influenced by

local factors, such as client habits. The cash flow can be observed in shifts and throughout the day, with significant variations in turnover. It was concluded that it is possible to generate higher revenue, which depends on the affirmation of the above factors of each sales facility. Regarding the assortment, the variety of items is wide and depends on the previously mentioned demand factors. The most common form of purchase is tied - trade, when the consumer buys more than one product, and the most active consumers are smokers.

The conclusions and proposals of the study indicated that the biggest problem in kiosk work is labor, which affects working hours, efficient engagement of business space, and, thus, the overall business effect. Turnover, services, and items sold depend on many factors and do not represent a constant that could lead to a general conclusion about their cost-effectiveness or commitment to a particular type, even in a similar location. Successful placement of an adequate item requires constant engagement and an organized approach, which implies a dynamic response of the entire logistics system to the expressed needs, which are almost constantly changing. In conclusion, the research determines the directions for the possibility of applying the smart trade concept adapted to the characteristics of the kiosk profile. The primary critical correlations to which the smart shop concept should provide an answer have been established:

- Lack of workforce due to unfavorable working conditions;
- Limited communication due to language barriers;
- One workplace - sales point affects the creation of queues and traffic restrictions;
- Inability to perform continuous work 24/7/365;
- Buyers are sold what they are looking for, not offered what can be sold;
- Impossibility of analysis and improvement of business (offer) in real-time.

In response to the highlighted fundamental problems, the application of the smart shop concept on a retail kiosk facility was offered, which envisages the following solutions:

Technical - technological aspect:

- Unlimited working hours 24/7/365.
- Possibility to work without a seller;
- More than one sale point;
- Payment by banknotes, payment cards, and mobile phone;
- Readiness for connection with the infrastructure of smart cities.
- Application connection, ordering, booking, and payment.

Socio-economic aspect:

- Monitoring and analysis of consumption and customer habits;
- Optimization of procurement and logistics costs;
- Specification of consumption and demand for each item per micro-locations;
- Active advertising.

Socio-psychological aspect:

- Automatic recognition of gender and age of the customer;
- Interactive product offer in real-time depending on the customer profile;
- Ability to display personalized ads tailored to the profile of each customer;
- Product reservation by mobile phone, personalized application approach;
- Active participation in product selection and creation of actions;
- Promotions and products offered by customized advertising.

As a result of the application of the concept on the kiosk business model, the company ASC launched the first integrated smart kiosk. It was presented as concept confirmation at the International Fair of Smart Technologies - iSEC 2019, at the Belgrade Fair. The essential characteristics of the smart shop are automated points of sale, the possibility of working without a seller, paying with banknotes, cards, and mobile phones, and unlimited working hours (24/7/365). Smart-corner shop achieves an interactive relationship with customers in real-time through automatic recognition of the gender and age of the customer, automatic adjustment of the product offer depending on the customer profile, and placement of personalized ads tailored to each customer. It enables smart business support by monitoring and analyzing the consumption and habits of customers, optimizing the procurement and filling of items, economizing logistics costs as well as the specification of consumption and demand at all micro-locations. The smart-corner shop integrates Artificial Intelligence (AI), Big Data, Deep Learning, and Open Data, which makes this product Internet of Things (IoT) Ready (ASC, 2019).



Picture 1. Smart kiosks prototype at the International Fair of Smart Technologies - iSEC 2019, at the Belgrade Fair (Author)

4.2. ANALYSIS OF PROTOTYPE OPERATION IN REAL CONDITIONS

The analysis presents data from the first-month operation. The Smart Kiosk was put into operational use at the end of February 2021, with the combined engagement of the smart module (24/7) and labor (12/6). This approach was chosen due to the requirement to become accustomed to users and their instructions for using new technologies.

The location of the Smart Kiosk is in the central area of the city of Kruševac. In the immediate vicinity (100 meters away), there is a classic kiosk sales facility with limited working hours. After 8 p.m., this category has no open sales facilities in the vicinity of 500 meters.

The meteorological aspect could influence hardware stability and potential customers' presence. The observed period was changeable, with low temperatures and heavy rain, sleet, and snow precipitation. The maximum daily temperature ranged from 18°C to 1°C. The average daily temperature in the observed period was 8°C. The average night temperature was -1.8°C.



Picture 2. Operational confirmation of the Smart Kiosk concept

The hardware-automated sales module worked without system failure in the observed time interval. Two thousand eight hundred seventy-three transactions were performed (67.4 per day), of which 1,724 were cash transactions for 2,233 sold items.

According to the structure of customers, the most active are adult women (from 25 to 45 years old) with 1,312 transactions. Advertising messages were broadcast over a total of 313 hours, and a total of 6,097 people were reached by the advertisement, of which 4,548 people reacted to the advertisement. In general, the interdisciplinary innovation Smart Kiosk, as a confirmation of the concept of smart commerce, has shown sustainability and functional justification. Based on the collected data, it can be said:

Considering that it is a complex, interdisciplinary project, the analysis indicates that the technical-technological part fully met expectations. Also, the second part, which consists of socio-economic and psychological behavioral ones, is open for intensive development, namely in the domain of selection and improvement of assortment, improvement of sales of goods and advertisements, development of relations with customers and promotion and marketing of the concept.

5. CONCLUSION

The main characteristic of a smart service is that the provider of services or goods and the consumer or user interaction create new value. This process is called value co-creation (Gavrilova & Kokoulina, 2015). As part of this process, the supplier, through the potential of smart service, constantly adjusts the offer to the customer's individual needs (Massink et al., 2010). Therefore, the interaction between the supplier of goods or services and the user or customer is necessary for the services to be successfully implemented. Monitoring the development of customer needs further harmonizes and develops. (Demirkan et al. 2015). Smart services are individual, dynamic, quality-based services that are user-friendly

solutions. Their creation is based on real-time market research, technologies, and social and environmental characteristics, which contribute to value co-creation between customer and supplier in all processes, from strategic planning and development to the application of smart services (Dreyer et al., 2019). The service development process is based on service strategy development, service design, service transition, service operationalization, and continuous service improvement (ITIL, 2019).

The literature dealing with the field of smart services in trade in services mainly deals with data analysis, business models, customer involvement, knowledge management, machine learning, pricing, privacy and security issues, service quality, standardization, technology, development trends, consumer behavior, and user interface (Dreyer et al., 2019). The development approach based on previous research offers a framework of a general approach to smart trade or smart shop as a concept based on synergic correlation of technic and technology with socio-psychological aspects of users' needs and the socio-economic interests of suppliers. The stated concept framework coincides with the project vision and the solution ASC implemented as a functional - early concept validation model. Technological innovative approaches, organizational requirements, and limitations are sublimated in the applied form. The communication aspects of the buyer-seller (machine) relationship, an advanced active approach to a specific user with a customized offer of articles, advertisements, and service information in a selected language, are integrated into one place.

In this way, the smart retail concept's basics were successfully applied to the mentioned business model of a small sales facility, a kiosk. For further research, it remains to monitor the further implementation of the concept and its confirmation on the market in actual circumstances and business conditions.

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IZAZOVI UPRAVLJANJA IT PROJEKTIMA U ODBRAMBENOJ INDUSTRIJI

CHALLENGES IN IT PROJECTS MANAGEMENT IN THE DEFENCE INDUSTRY

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Apstrakt: Projekti informacionih tehnologija (IT) u odbrambenoj industriji su projekti koji se bave razvojem i primenom informacionih tehnologija u odbrambenim sistemima za potrebe oružanih snaga. Ovi projekti imaju za cilj unapređenje sistema rukovođenja i komandovanja u vojsci radi povećanja sopstvene i smanjenja borbene efektivnosti neprijateljskih snaga. Najznačajniji IT projekti u odbrambenoj industriji su projekti komandno-informacionih sistema (KIS). Upravljanje informaciono-tehnološkim (IT) projektima u odbrambenoj industriji predstavlja složen zadatak koji zahteva pažljivo planiranje, implementaciju i nadzor. Najčešći uzrok njihovog neuspeha su nejasno definisani zahtevi koji kao posledicu imaju nemogućnost isporuke zahtevanih funkcionalnosti. U radu su opisani najznačajniji izazovi u upravljanju IT projektima u odbrambenoj industriji i ukazano na način njihovog prevazilaženja.

Ključne reči: upravljanje IT projektima, IT projekti u odbrambenoj industriji, komandno-informacioni sistemi, rukovođenje i komandovanje, sistemi za podršku u odlučivanju, veštačka inteligencija

Abstract: Information technology (IT) projects in the defense industry deal with developing and applying information technology in defense systems for the needs of the armed forces. These projects aim to improve the command and control system in the army in order to effectively increase its own and reduce the combat effectiveness of enemy forces. The most critical IT projects in the defense industry are C4ISR projects. Managing IT projects in the defense industry is a complex task that requires careful planning, implementation, and oversight. The most common cause of their failure is vaguely defined requirements, making delivering the required functionalities impossible. The paper describes the most significant challenges in managing IT projects in the defense industry and indicates how to overcome them.

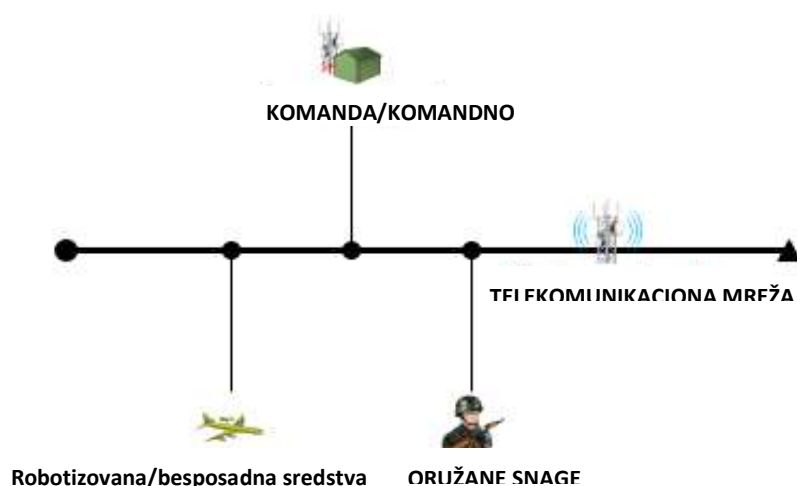
Keywords: IT project management, IT projects in the defense industry, C4ISR, command and control, decision support systems, artificial intelligence.

1. UVOD

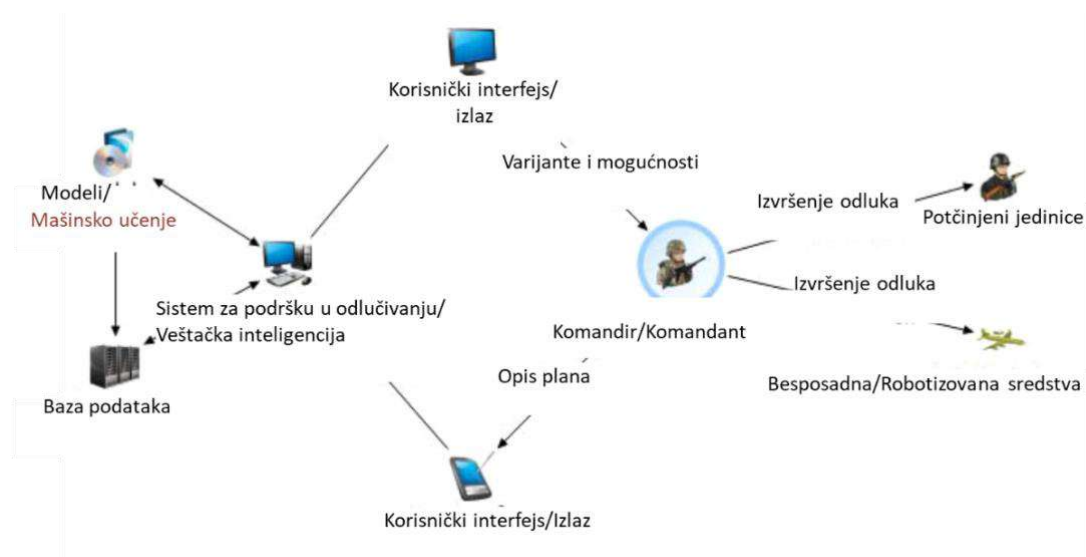
Savremeni odbrambeni sistemi, kao specifična podvrsta savremenih tehnoloških sistema, u velikoj meri zavise od softverske komponente. Softver je ključni element skoro svakog sistema naoružanja koji ministarstvo odbrane nabavlja, i uloga softvera u podršci nacionalne bezbednosti neprestano raste (Rice, 2019). Takođe, softver je osnovna komponenta komandno-informacionih sistema (KIS), koji spadaju u najznačajniju grupu IT projekata u odbrambenoj industriji (slika 1). Komandno-informacioni sistemi su posebna vrsta informacionih sistema namenjenih za podršku komandovanju i rukovođenju u vojsci.

Predstavljaju automatizovani podsistem komandovanja namenjen za prikupljanje, obradu, prenos i korišćenje informacija potrebnih za upotrebu i dejstvo oružanih snaga.

Softver i veštačka inteligencija (VI) su osnova za pokretanje i izvođenje višedimenzionalnih borbenih operacija, podržavaju interoperabilnost među savezničkim snagama i omogućavaju informacionu superiornost i prednost u odlučivanju u odnosu na neprijatelja (Soare i dr., 2023). Zahvaljujući odgovarajućem softveru i primeni VI, savremeni KIS omogućavaju uspešno rukovođenje i komandovanje konvencionalnim oružanim snagama kao i besposadnim, a u skoroj budućnosti, i robotizovanim sredstvima na bojnopolju (slika 2)



Slika 1. Opšta arhitektura savremenih KIS (Stodola & Mazal, 2017)



Slika 2. Mašinsko učenje i veštačka inteligencija u KIS (Stodola & Mazal, 2017)

U odnosu na konvencionalne projekte, projekti odbrambene industrije su jedinstveni. Oni su finansirani od strane vlade i javnih preduzeća, nisu dostupni javnosti i njihov uspeh je teško proceniti i izmeriti. Iako se budžet i rokovi projekata u odbrambenoj industriji mogu proceniti, zadovoljstvo kupaca i krajnjih korisnika je mnogo teže odrediti (Sadeh i dr., 2010), osim u borbenim dejstvima. Softver je sastavni deo složenih borbenih sistema i često najviše utiče na troškove, vreme razvoja i tehničke performanse u programima razvoja ministarstva odbrane (Rice, 2019). Za uspešno upravljanje IT projektima i softverskim projektima u odbrambenoj industriji, potrebno je razumeti njihovu prirodu, koja se najbolje može opisati socio-tehnološkim pogledom na definiciju informacionih sistema opisanim u (Boell i Cecez-Kecmanovic, 2015): polje (komandno-)informacionih sistema obuhvata više od tehnološkog sistema, ili samo društvenog sistema... obuhvata fenomene koji nastaju pri međusobnoj interakciji. Znači, komandno-informacioni sistemi, kao najznačajnija vrsta IT projekata u odbrambenoj industriji nisu samo tehničko-tehnološki projekti, već projekti na koje utiče ljudski faktor, kao i odnosi koji se stvaraju u specifičnom okruženju između ljudskog faktora i tehničko-tehnoloških sistema.

2. KLJUČNI IZAZOVI U UPRAVLJANJU IT PROJEKTIMA U ODBRAMBENOJ INDUSTRIJI

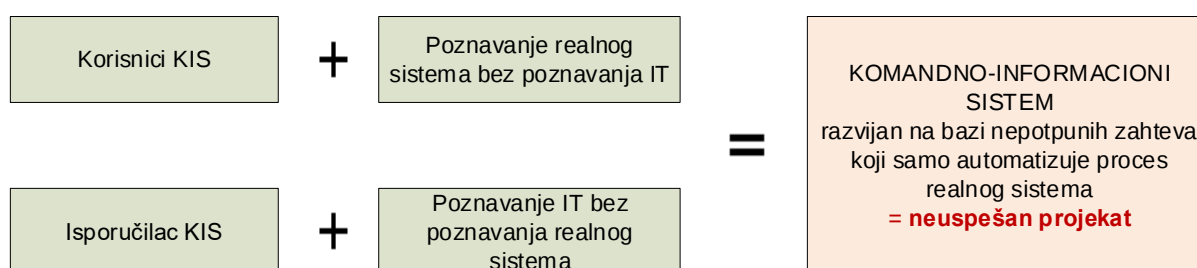
Ključni izazovi u upravljanju IT projekti u odbrambenoj industriji u najvećem broju slučajeva odgovaraju ključnim izazovima u upravljanju projektima komandno-informacionih sistema. Izazovi u upravljanju projektima KIS zasnovani su na potrebama usaglašavanja zahteva krajnjih korisnika KIS sa raspoloživim tehničko-tehnološkim mogućnostima, u ograničenim vremenskim i finansijskim okvirima i sa ograničenim razvojnim ljudskim resursima. Jedan od razvojnih okvira, koji se u praksi pokazao kao dobar odgovor na izazove u upravljanju složenim projektima u odbrambenoj industriji, je DoDAF (Defense Architecture Framework), definisan od strane ministarstva odbrane SAD.



Slika 3. DoDAF razvojna arhitektura (Mittal, 2006)

DoDAF razvojna arhitektura je jedinstvena po upotrebi tzv. pogleda na problem koji treba rešiti. Najopštija razvojna DoDAF arhitektura, prikazana na slici 3, sadrži tri osnovna pogleda: operativni, sistemski i tehnički. Operativnim pogledom su opisani zahtevi krajnjih korisnika - konceptualni opis svih komponenti KIS-a, njihov međusobni odnos i potrebe za komunikacijom i komunikacionim kapacitetima. Sistemski pogled ukazuje na postojeće

tehničko-tehnološke i ljudske razvojne mogućnosti, u odnosu na zahteve iskazane u operativnom pogledu. Tehnički pogled definiše propisane standarde, konvencije i tehnologije koje je moguće primeniti u zadovoljenju zahteva iz operativnog pogleda, a na osnovu mogućnosti opisanih u sistemskom pogledu. Ključni izazovi u upravljanju projektima KIS u odbrambenoj industriji, posmatrani kroz DoDAF arhitekturu, jesu definisanje kvalitetnih specifikacija zahteva za sva tri pogleda i implementacija funkcionalnosti KIS koje ih zadovoljavaju. Međutim, razvoj komandno-informacionih sistema se razlikuje u odnosu na razvoj komercijalnih informacionih sistema i softvera. Jedan od glavnih razloga za to je što korisnik KIS, ujedno i njegov naručilac, vojska, koja kao deo državnih institucija, ima ozbiljne nepotrebne troškove u procesu projektovanja i razvoja KIS-a (Demir, 2009). Odbrambeni softverski projekti, kojima pripada i KIS, zauzimaju poslednje mesto u pogledu produktivnosti softvera (Capers, 2002). Na slici 4 prikazani su glavni razlozi za prethodno navedene tvrdnje.



Slika 4. Izazovi u razvoju komandno-informacionih sistema

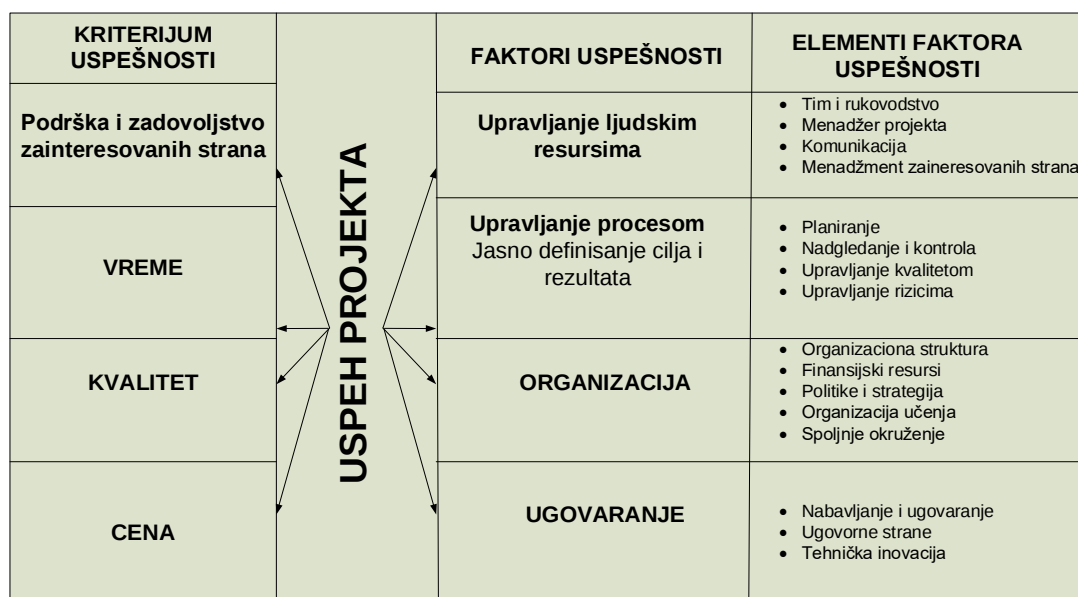
Korisnici KIS-a su komandiri i komandanti vojnih jedinica koji nisu dovoljno upoznati sa savremenim tehničko-tehnološkim mogućnostima, kao i sa raspoloživim resursima za njihov razvoj i implementaciju. Međutim, njihovi zahtevi, na osnovu koji se formira operativni pogled, vrlo često su zasnovani ne na osnovu poznavanja realnog sistema i njihove uloge u njemu, već na viziji kako bi taj sistem trebalo automatizovati, zasnovanoj na nedovoljnom, ili čak pogrešnom, poznavanju tehničko-tehnoloških mogućnosti. Zbog toga njihovi zahtevi za razvojem u velikoj meri ne doprinose ispunjenju namene operativnog pogleda i stvaranju okvira za specifikaciju zahteva za funkcionalnostima koje se očekuju od novog komandno-informacionog sistema. Na osnovu neodgovarajućeg operativnog pogleda formira se i neodgovarajući sistemski i tehnički pogled. Isporučilac KIS-a, koji ne poznaje realni sistem, projektuje i implementira KIS na osnovu nedovoljno kvalitetnih zahteva. Postojeći modeli razvoja softvera ne mogu kvalitetno odgovoriti na ovako definisane zahteve, zbog čega je proces projektovanja i implementacije podložan uticaju izmena i dopuna specifikacije zahteva u realnom vremenu.

3. FAKTORI USPEHA IT PROJEKATA U ODBRAMBENOJ INDUSTRIJI

Uspeh IT projekata u odbrambenoj industriji od podjednakog značaja je za krajnje korisnike, pripadnike oružanih snaga, kao i za isporučioce rezultata IT projekata. Za obe strane, naručioce i isporučioce, u skladu sa postojećim zakonskim regulativama uspeh IT projekta znači isporučiti traženi proizvod u skladu sa ugovorenim obavezama u uslovima nedostatka resursa (kadrovskih, vremenskih, finansijskih) i nerazumevanja prirode IT projekata. Nedostatak kadrovskih resursa iz oblasti informacionih tehnologija na strani naručioca (oružanih snaga, vojske) dovodi do problema u jasnom definisanju ciljeva projekta i jasnom

definisanju zahteva ka isporučiocima, što je prikazano na slici 4. S druge strane, nedostatak ljudskih resursa koji razume potrebe oružanih snaga, iako raspolaže odgovarajućim tehničko-tehnološkim znanjima, u kompanijama koje se bave IT projektima u odbrambenoj industriji, dovodi do nerazumevanja ciljeva projekata. U oba navedena slučaja može doći do neuspjeha IT projekata u odbrambenoj industriji.

Faktori koji uslovljavaju uspjeh IT projekta u odbrambenoj industriji su u saglasnosti sa opštim faktorima uspjeha projekata, prikazanim na slici 5.



Slika 5. Uspjeh projekta (Merwe i Hauptfleisch, 2012)

Među njima naročito se ističu:

Upravljanje procesom, kroz jasno definisane ciljeve projekta koji omogućavaju fokusiranje tima i usklađivanje aktivnosti sa željenim rezultatima projekta.

Podrška i zadovoljstvo zainteresovanih strana: kod projekata komandno-informacionih sistema naručioci posla, komandna struktura, mora imati razloge zbog kojih će nastaviti da podržava projekat. To znači da komandna struktura mora da dobije relativno brze rezultate u vidu funkcionalnosti novog sistema koje su vidljive i upotrebljive u svakodnevnom procesu rukovođenja i komandovanja.

Efikasno upravljanje zahtevima za promenama: efikasno upravljanje promenama omogućava prilagođavanje resursima projekta u skladu sa novim zahtevima naručioca ili novim okolnostima, minimizirajući negativne uticaje na projekat.

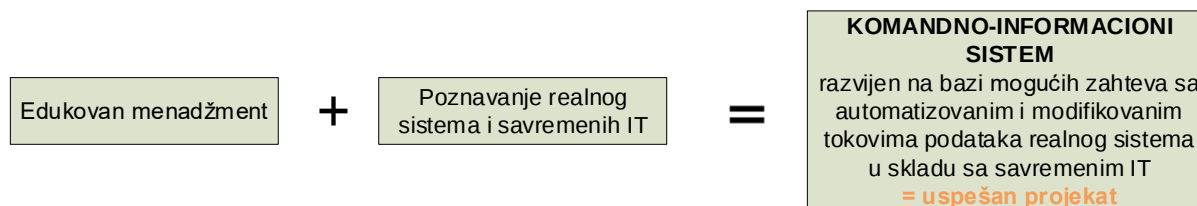
Ključnu ulogu u sva tri navedena faktora imaju menadžerske strukture naručioca i isporučioa projekta (slika 6).

Menadžerska struktura naručioca, zahvaljujući poznavanju realnog sistema, potreba rukovođenja i komandovanja, kao i mogućnosti savremenih tehničko-tehnoloških sistema u IT, uspešno utiče na:

- upravljanje celokupnim procesom vođenja IT projekata u odbrambenoj industriji uobličavanjem zahteva komandnog kadra u skladu sa raspoloživim resursima, aktuelnim tehničko-tehnološkim mogućnostima i raspoloživim vremenskim rokovima,
- zadobijanje podrške komandnog kadra (koji je i naručilac posla) kroz definisanje prioriteta u isporuci kritičnih funkcionalnosti neophodnih za proces rukovođenja i komandovanja, i
- uobličavanjem zahteva za izmenom i dopunom specifikacije zahteva komandnog kadra u skladu postojećim tehničko-tehnološkim mogućnostima i sa raspoloživim sopstvenim i resursima isporučioa.

Menadžerska struktura isporučioa, zahvaljujući poznavanju mogućnosti savremenih tehničko-tehnoloških sistema u IT i iskustva u vođenju IT projekata u odbrambenoj industriji, uspešno utiče na:

- upravljanje celokupnim procesom razvoja i isporuke IT projekata u odbrambenoj industriji usaglašavanjem zahteva sa menadžerskom strukturom naručioa, u skladu sa raspoloživim resursima, aktuelnim tehničko-tehnološkim mogućnostima i raspoloživim vremenskim rokovima,
- zadobijanje podrške upravljačke strukture svoje kompanije i komandnog kadra naručioa, prioritetnim isporukama kritičnih funkcionalnosti neophodnih za proces rukovođenja i komandovanja, i
- usaglašavanjem i uobličavanjem zahteva za izmenom i dopunom specifikacije zahteva komandnog kadra u saradnji sa menadžerskom strukturom naručioa, a skladu sa postojećim tehničko-tehnološkim mogućnostima i raspoloživim resursima.



Slika 6. Uloga menadžmenta u faktorima uspešnost IT projekta u odbrambenoj industriji

4. PREVAZILAŽENJE IZAZOVA UPRAVLJANJA IT PROJEKTIMA U ODBRAMBENOJ INDUSTRIJI

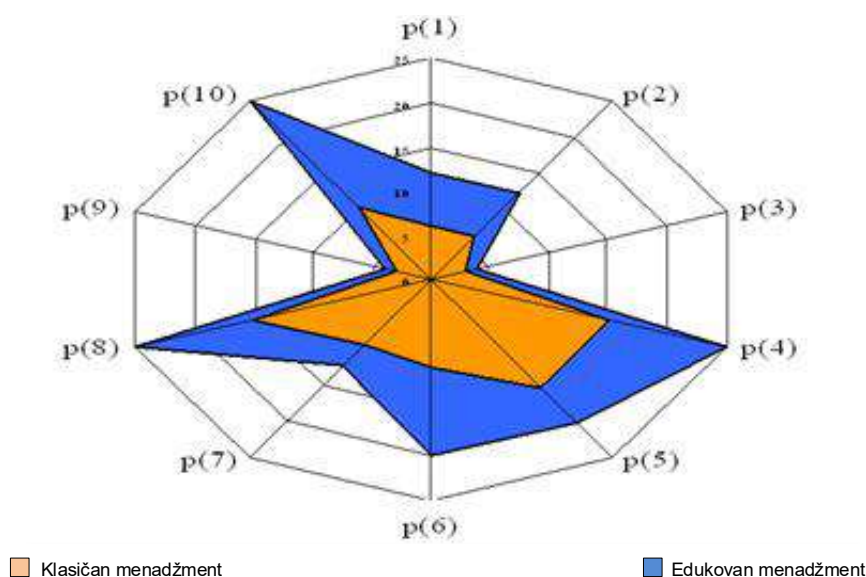
Najveći uticaj na prevazilaženje izazova upravljanja IT projektima u odbrambenoj industriji može se izvršiti uticajem na faktore uspeha, opisane u prethodnom poglavlju.

Istraživanje opisano u doktorskoj disertaciji Trajkovića (2013) pokazalo je da ukoliko postoji posebna organizaciona celina u Vojsci Srbije koja bi se bavila vođenjem projekata informacionih sistema, onda bi uspešnost takvih projekata bila znatno veća u odnosu na postojeće stanje (tabela 1 i slika 7). Navedena posebna organizaciona celina bila bi sastavljena od kadrova koji poznaju potrebe rukovođenja i komandovanja, ali imaju domensko znanje iz oblasti projektovanja informacionih sistema. Takođe, navedeno istraživanje je pokazalo da je stalno potrebno vršiti edukaciju kako IT kadra iz oblasti rukovođenja i komandovanja, tako i komandnog kadra iz tehničko-tehnoloških dostignuća u oblasti rukovođenja i komandovanja i odbrane. U tom slučaju bi se mogla stvoriti kritična masa, na slici 6 prikazana kao „edukovani menadžment“ koji bi mogao da značajno utiče na

upravljanje IT projektima u odbrambenoj industriji jer bi: bio svestan realnih potreba oružanih snaga (naručioca posla) i sposoban da ih iskaže u obliku pogodnom za izvršioca (kompanije odbrambene industrije), i bio bi sposoban da u realnom vremenu usklađuje novonastale zahteve komandnog kadra sa mogućnostima isporučioća.

Tabela 1. Uticaj menadžmenta na efikasnost IT projekata u odbrambenoj industriji (Trajković, 2013)

R.b.	Parametar	Težina parametra	Ocena parametra po alternativama	
			aktuelni pristup	novi pristup (edukovani menadžment)
	p	t(p)	OA(p)	ON(p)
1.	Pravovremenost pokretanja aktivnosti projektu	3	2	4
2.	Kvalitet izrađene specifikacije zahteva	3	2	4
3.	Prihvatljivost korisničkog interfejsa	1	3	4
4.	Raspoloživost	5	3	5
5.	Funkcionalnost	5	3	4
6.	Žilavost	5	2	4
7.	Brzina razvoja	3	3	4
8.	Pogodnost za održavanje	5	3	5
9.	Jednostavnost izrađenog programskog koda	1	3	4
10.	Zaštićenost	5	2	5
VREDNOST ALTERNATIVE:			2.56	4.42



Slika 7. Uticaj menadžmenta na efikasnost IT projekata u odbrambenoj industriji (Trajković, 2013)

Savremeni odbrambeni sistemi postali su sistemi zasnovani na softveru (Demir, 2009), pa su tako i IT projekti u odbrambenoj industriji u stvari najvećim delom softverski projekti. Potrebe za softverom se razvijaju, a ažuriranja softvera se dešavaju brže nego ikad. Trenutni ciklusi nabavke i ugovaranja (razvoja) su suviše spori i mogu dovesti do potencijalno zastarelog softvera. Zbog toga nabavka (razvoj) softvera mora nastaviti da se menja da bi se prilagodila potrebnoj brzini i agilnosti razvoja. Ova promena se mora desiti u saradnji sa industrijom (Department of Defense, 2022). Dosadašnje tradicionalno upravljanje projektima u sektoru odbrane fokusiralo se na ispunjavanje tehničkih zahteva, ponekad na račun trajanja i troškova projekta. Međutim u agilnom pristupu razvoja softvera za potrebe ministarstva odbrane Velike Britanije, nazvanom AgilePM, zahtevi za performanse su izraženi kao nešto što „Mora“, „Trebalo bi“, „Moglo bi“ ili „Ne mora (ovaj put)“ (Whitepaper, 2023). Na taj način obezbeđuje se fleksibilnost u specifikaciji zahteva kako bi se obezbedila isporuka projekta na vreme i po ceni prihvatljivog rešenja „prilagođenog svrsi“ (Whitepaper, 2023), a ne savršenog koji je teško isporučiti.

5. ZAKLJUČAK

Savremeni IT projekti u odbrambenoj industriji, po svojoj prirodi najviše odgovaraju softverskim projektima. Uspešnost softverskih projekata najviše zavisi od jasno definisanih zahteva i mogućnosti njihove implementacije. U slučaju postojanja edukovanog menadžmenta, zahtevi za softverom, a samim tim i za IT projektima u odbrambenoj industriji, mogu biti jasno i nedvosmisleno definisani. Primenom agilne metode upravljanja projektima, uz edukovani menadžment, jasno definisani zahtevi mogu se grupisati u kategorije koje će omogućiti bržu isporuku funkcionalnosti u skladu sa zahtevima naručioca – komandnog kadra. Zbog toga se može zaključiti da izazovi upravljanja IT projektima u odbrambenoj industriji mogu uspešno biti prevaziđeni uz edukovani menadžment na strani naručioca i isporučioca, i uz primenu agilne metode upravljanja projektom. Na taj način naručioci i isporučiooci neće biti strane koje pokušavaju da se zaštite jedna od druge, u slučaju neuspeha projekta, već strane koje zajedno rade na ispunjavanju „prihvatljivog rešenja prilagođenog stvarnim potrebama, a ne savršenog rešenja koje je teško isporučiti“.

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STUDENT BORROWING IN PROJECT MANAGEMENT PROFESSION: AN INSPIRING OPPORTUNITY OR A LIFETIME BURDEN?

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Abstract: Since their emergence in the late 1940s, student loans have become an extremely widespread phenomena in dozens of countries around the globe, with the main aim of allowing individuals of various backgrounds to attend universities. While this practice can be seen as completely positive at the first glance, there is one major drawback to it, which stems right from its name: every loan requires repayment. Inaccurate or insufficient information, lack of general knowledge on how financial markets function, individuals' cultural backgrounds – all these and multiple other factors lead young people to making poor decisions when opting to make use of student loans or to not utilize those, which can potentially worsen their financial state in the future. This paper aims to make a worldwide overview of the student loan market, also devoting attention to those countries where student borrowing is not a common practice, in order to highlight the impact of various student borrowing policies on the borrowers themselves, the educational sector and the society in general. Additionally, this research incorporates an analysis of a small international questionnaire among project management students with regards to their borrowing experience.

Keywords: *student borrowing, project management profession, grants, higher education, debt, repayment.*

1. INTRODUCTION

It is not surprising that education brings a number of economic benefits to a given country or even to the entire world; some of those are: increased wages, lower unemployment via labor productivity, leading to higher levels of innovation and tax revenues and, thus, overall economic growth (Simkovic, 2013). It was considered that “a college degree on average increases wages by 40%”, and bachelor's degree holders' poverty level is three times lower than that of those with only a high school diploma (Edmiston et al., 2012; Simkovic, 2013). However, all benefits come at a cost and, therefore, “for millions of students there are numerous barriers that impede progress to attaining a bachelor's degree”, the main one being the increasing prices of college education (Cunningham & Santiago, 2008).

For example, tuition fees for project management programs, on average, are \$18,300 in Italy, \$16,000 in China, \$6,900 in Russia and even \$58,000 in the U.S. (“1174 Master's degrees in project management,” n.d.). At the same time, according to statistics, the enrollment rates around the world are generally increasing. In their article (2012), Avery and Turner reported that the “overall undergraduate enrollment in college has increased from 10.5 million in 1980 to 17.6 million in 2009”. This leads to the question of where students get the money to pay huge tuition fees. Of course, one option they have is to simply attend lower cost institutions or change their attention patterns (study part-time, for example). However, if one really wants to attend a particular university or has no money for higher education at all, student loans come to aid. According to Shen and Ziderman (2008), “subsidized loan schemes may lead to

greater access to university education for the poor and minority groups, thus contributing to social equity”. But is this true in reality?

With the first government-guaranteed student loan issued 65 years ago, they have now been in the media and policy spotlight for a while, and not in the best possible light, “especially after outstanding loan balances [in the U.S.] hit more than \$1 trillion” back in 2013 (Andruska et al., 2014). However, it is important to look not only at the huge debt amount, but also at the rapid pace, with which this debt accumulates; according to Edmiston et al. (2012), that amount was only \$364 billion in 2005, which means an annual rate of more than 15%. According to Boatman et al. (2022), “in 2019-2020, 95% of the 1.5 million undergraduates in England took out a government-funded student loan, worth an annual average of \$19,994”. In the U.S., “among students graduating with a bachelor’s degree from four-year public institutions in 2012, 43% had no student loan debt”; for the rest, the average level of debt was \$25,000 (Andruska et al., 2014). The same can be mentioned about China, where the National Student Loans policy has been launched in 1999 (Qi et al., 2022). As a result, “financial aid for university students increased from 16,298 billion yuan in 2006 to 124,379 billion yuan in 2020, and the number of sponsored university students increased from 153,027 million to 367,822 million” (Qi et al., 2022). With student loan schemes being “in operation in more than seventy countries around the world”, the issue is not only limited to the mentioned countries (Shen & Ziderman, 2008).

2. LITERATURE REVIEW

2.1. BORROWING IN THE U.S. AND ENGLAND

The majority of research on student borrowing originates in the U.S., which is not surprising due to the relative abundance of different options, such as subsidized and unsubsidized Stafford Loans, PLUS loans, and Perkins loans (Avery & Turner, 2012). Even less surprising is the fact that back in 2009, the annual volume of federal loans has exceeded 11 million, allowing the total student loan debt in the country to overtake the total credit card debt (Avery & Turner, 2012). Private student loans in the U.S., which usually have far less favorable terms, are far less popular, having comprised less than 10% of all loans between 2009 and 2013 (Baum & Steele, 2018).

The process of applying for a loan in the U.S. is quite straightforward at the first glance: one has to submit a Free Application for Federal Student Aid (FAFSA), which is then evaluated in order to assess individual’s financial wellbeing (Avery & Turner, 2012). With regards to the differences between the various federal loans, Stafford ones “provide more favorable terms to borrowers and are made regardless of credit history” but they possess certain limits that are often too small to satisfy students’ needs (Rendleman & Weingart, 2014). Subsidized Stafford loans that accrue no interest while the borrower is attending school, are only available to those “who demonstrate financial need” and are not available to graduate students (Rendleman & Weingart, 2014). Another type of loans are the PLUS ones; however, those possess a higher interest rate and are only available for graduates or parents of undergraduates (Rendleman & Weingart, 2014). The final federal loan category in the U.S. are the Perkins loans which are the most affordable ones, with a fixed interest rate of only 5% that only comes into effect after student’s graduation (Rendleman & Weingart, 2014). Nevertheless, only students with demonstrated financial need are eligible for Perkins loans, making their portion in the market extremely low. The last type of student loans in the U.S. are private ones; those may come from a variety of sources like financial institutions,

nonprofit organizations, or even schools themselves, however, the one thing that is constant about them is the higher interest rates compared to their federal substitutes (Rendleman & Weingart, 2014).

The situation in England is quite different, with the repayments being income-contingent, and terms and conditions being set by the central government (Boatman et al., 2022). In the income-contingent system, “the collection of the debt depends on the borrowers’ future levels of income” (Chapman, 2005). Borrowers start repaying their debts after graduation when their earnings reach a threshold of \$37,509, paying 9% of their earnings until either full repayment or forgiveness, which happens after 30 years (Boatman et al., 2022). It has to be mentioned that the U.S. has also started to offer income-based repayment in 2009, requiring to pay “10% of the income for 20 years prior to forgiveness”, but “they suffer from administrative challenges and a general lack of accessible information about their benefits” (Boatman et al., 2022). For instance, English borrowers do not need to provide repeated verification of their incomes, with payments being automatically withdrawn through the tax system; the American borrowers have to do that and, which creates challenges for those who switch jobs often. As a result, only 20% of borrowers have selected an IBR plan by 2016 (Boatman et al., 2022).

England is considered to have a very effective student loan administration system, with a single governmental organization (Student Loans Company) managing loans from start to finish; it provides a single application for both tuition fee and maintenance loans, a calculator to determine the maximum amount to borrow and an automatic, income-contingent repayment system (Boatman et al., 2022). On the contrary, the U.S. has “eight different repayment plans with varying eligibility requirements representing options with fixed, graduated, or income-contingent repayment amount”, making the system far more complicated and contributing to increased loan aversion in comparison to England (Federal Student Aid, US Department of Education, 2021). In sum, due to its student loan system, England “has higher tuition fees leading to higher borrowing rates”, but no loan defaults, which has some serious disadvantages that will be discussed in the later stages of the paper (Boatman et al., 2022).

2.2. BORROWING WORLDWIDE

Obviously, student loans are not only present in two countries; however, far less information is available regarding student borrowing outside the U.S. and England, and it will be summarized in this section of the paper. Different countries use various loan schemes, most of which allow students to benefit from built-in government subsidies such as zero interest payment during studies, grace periods, interest rates equal to inflation rates, below-market interest rates, and some other (Shen & Ziderman, 2008). The overall effectiveness of a student loan is measured by the repayment ratio, which is “the ratio of required payments to the loan size received” (Shen & Ziderman, 2008). The average repayment ratio in the 39 countries, studied by Shen and Ziderman in their 2008 research, was 60.85%. The highest repayment ratios have been found in Canada, Netherlands and Namibia (almost 100%), meaning “virtually no built-in subsidy for individual borrowers in these schemes” (Shen & Ziderman, 2008). In Czech Republic, for instance, repayment reached 108%, which is not surprising due to the interest rate of more than 12% throughout the entire repayment period (Shen & Ziderman, 2008). Similarly, New Zealand students, who do not graduate with enormous debt in comparative terms, face high interest rates and low income thresholds that make the burden a heavy one (Usher, 2005). Countries like Egypt and Nigeria, on the other

hand, are far more “generous” towards students, having repayment ratios of approximately 10% (Shen & Ziderman, 2008). Conversely, Swedish students normally graduate with very large debts, but low interest rates and long repayment periods make the burdens very mild (Usher, 2005).

Overall, around thirteen countries studied showed repayment ratios of more than 80%, while eighteen countries had ratios of less than 60%; in addition, 20 schemes had no interest while in school and 6 were completely interest-free (Shen & Ziderman, 2008). In terms of recovery ratios, which is the “present value of net repayments, including repayment default and administration costs, in relation to loan size”, the best-performing country was Japan with a recovery ratio of 68%; all other countries from the sample had ratios of 50% or less, with countries like Philippines having a ratio of -22% (Shen & Ziderman, 2008; Ziderman, 2002).

In Russia, where very few information is available regarding student borrowing, due to high inflation, the original 22% interest rate resulted into only 12% repayment ratio on average (Shen & Ziderman, 2008). Nevertheless, as stated by Sedova (2013), back in 2010 student loans constituted around 1% of all consumer loans. Moreover, taking the students’ starting salaries into consideration, the conditions were inappropriate for them, since they hardly differed from the conditions of any other consumer loans (Sedova, 2013).

2.3. DEFAULT AND AVERSION

Loans are “the first major capital investment” for the majority of the students and they carry serious consequences; therefore, “a borrower’s wisest course of action is not to default in the first place” (Avery & Turner, 2012; Rendleman & Winegart, 2014). Nevertheless, defaults happen: in the first quarter of 2012, around 9% of student loan accounts were over 120 days past due, which is the period after which a private loan is considered to be in default in the U.S. (Edmiston et al., 2012). For federal loans, the corresponding period is 270 days, unless there have been no additional arrangements made (Edmiston et al., 2012).

One of the main reasons for loan defaults is unemployment, especially, after events like the 2008 financial crisis, when even many of those employed faced lower-than-expected salaries. In order to prevent high default rates, U.S. government uses cohort default rate (CDR) as “a measure of the federal student loan repayment history of a particular group ... of borrowers” (Consumer Financial Protection Bureau, 2012). If it exceeds 25% in 3 consecutive years, institution is prohibited from participating in federal loan programs; however, this leads to some universities not participating in those programs, fearing high CDRs, and others even manipulating the CDRs by moving students into deferment or forbearance (Cunningham & Santiago, 2008; Simkovic, 2013). Another issue arising from that is grade inflation, which is more prevalent in humanities and social sciences; as a result, STEM major students, who generally study more and have higher average SAT scores, switch to those “social” majors at the expense of their future potential earnings (Simkovic & Santiago, 2008).

This issue can also be seen in the field of project management, which has been recently experiencing shortages of qualified professionals (Lyken, 2017). Although default rates on student loans are high in relation to other forms of debt, repayment ratios are also higher, “which limits the fiscal impact of student loan defaults” (Edmiston et al., 2012). Some even believe that the U.S. government benefits from defaults on student loans, which is false, if one includes the collection costs and the time value of money into the equation (Edmiston et al., 2012).

Now that the default aspect of student loans has been covered, it is time to address other reasons contributing to loan aversion. Despite the favorable conditions in many cases, students can still avoid borrowing due to their risk-averse personalities; for instance, they might be fearful of not graduating. Similarly, their negative decision may come from shortsighted risk aversion; a prospective student can underestimate the college degree value and decide against spending of such a considerable amount of money, especially, realizing the consequences of non-repayment (Cunningham & Santiago, 2008). Another reason might be the culture; students from certain ethnic groups “may have cultural or familial perspective on debt”, encouraging them not to borrow (Cunningham & Santiago, 2008). Finally, students (especially immigrants) might not have sufficient information or experience with financial institutions of a given country, leading them to forgoing loans even if they are technically eligible for them (Cunningham & Santiago, 2008).

3. RESULTS

As part of the research, an anonymous student questionnaire has been distributed in Russia, China and some of the European countries, aimed at receiving insights into their personal situations concerning loans.

Out of the 57 participants, who are students of project management programs or similar to it, only 10 (18%) have utilized student loans during their higher education. Among those who chose not to borrow, 25% did this because they have received a scholarship, 9% stated they had insufficient information, while the remaining 66% of responses are equally distributed among such versions as parental funding, self-funding and basic aversion due to fear of debt, complex application procedure and other. Two-thirds of those who did borrow received governmental loans, while the rest opted for private ones.

Interestingly enough, all of the students who had taken a loan said it was a good decision that eased their financial burden and added motivation to study, while only one person with a private loan mentioned difficulties in repayment due to inflation. In Russia, only 14% of the respondents have received student loans, which further confirms the aforementioned information about the unpopularity of student borrowing in the country, despite the relatively favorable conditions.

4. DISCUSSION AND IMPLICATIONS

Enrollment into college is probably the first major investment of both time and finances that an individual makes and it can affect their future investment decisions, since some student-borrowers “experience shame and resentment” from their debt burdens (Harris et al., 2020). While it seems to be logical to not “spoil” that first impression, the overall dynamics do not necessarily support this opinion. According to Shen & Zideman (2008), only 3 out of 13 countries examined showed lower repayment ratios in the period from the 1990s to 2008. This is further extended by Callender (2022), who criticizes UK loans, stating that, instead of “making higher education more affordable ... they have contributed to huge tuition costs, resulting in huge debts after graduation”. Callender (2022) adds that “neither fairness nor inclusion has been achieved”, with most prestigious universities remaining “dominated by students from the most privileged family backgrounds”. Edmiston et al. (2012), however, confirms that loans pose problems for some borrowers, but claims that those are outweighed by positive outcomes of a bachelor’s degree, such as greater financial stability that leads to

higher tax collection and lower usage of public assistance programs, making student loans an insignificant portion of the federal budget.

One implication of the current research would be to make student borrowing programs more transparent, providing clearer information to the candidates and making it easily accessible. This can be done by ensuring that high school counsellors get sufficient education about various tradeoffs of borrowing in order for them to give better advice to students. In addition, universities should take action to eradicate the cases of grade inflation that hinder some students' opportunities to excel in their respective majors.

Another implication would be the creation of efficient institutional management at all stages from evaluation of beneficiaries to academic monitoring and to loan collection; this may come at a cost, but this should cut the costs elsewhere (by decreasing defaults, for instance). Especially, since it is believed that many governments can easily reduce the pressures on students by giving a single, low interest rate for the life of loans (Usher, 2005). Finally, governments can also start offering emergency loans under special conditions for those who run into difficulties during repayment. These actions should make higher education more accessible to students and help businesses close the gap between the demand and supply of qualified professionals.

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PROJEKTNİ LANAC VREDNOSTI

PROJECT VALUE CHAIN

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Apstrakt: Danas se uspeh projekta ne posmatra samo do trenutka završetka projekta, već uključuje i period ostvarenja koristi, odnosno realizaciju svih uticaja projekta. Ovaj rad se bavi konceptom projektne vrednosti za različite stejkholdere. Cilj rada je da prikaže na koji način interdisciplinarnost doprinosi stvaranju vrednosti kroz projekte, spajajući koncept lanca vrednosti i odgovornog upravljanja. Rezultati rada pokazuju da interdisciplinarnost ima značajnu ulogu u kreiranju održivih rešenja, značajnih za savremeno upravljanje projektima.

Ključne reči: lanac vrednosti, projekta, odgovorno upravljanje projektom

Abstract: Nowadays, the project success is not observed until the moment of the project's completion, but also includes the period of benefits realization of, and the project impacts. This paper deals with the concept of project value for different stakeholders. The aim of the paper is to show how interdisciplinarity contributes to the creation of value through projects, combining the concept of value chain and responsible management. The results of the work show that interdisciplinarity has a significant role in creating sustainable solutions, important for contemporary project management.

Keywords: value chain, project, responsible project management

1. KONCEPT LANCA ZAJEDNIČKE VREDNOSTI

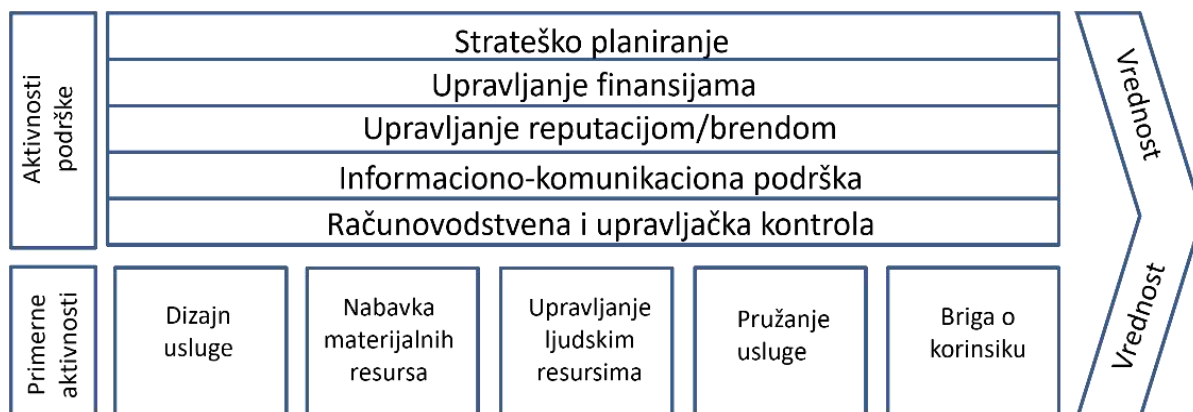
Savremeno okruženje koje čine brz tehnološki razvoj, inovacije i stremljenje ka rešenjima koja su održiva za ljude, životnu sredinu i ekonomski razvoj, predstavlja veoma složeno okruženje u kome se projekat realizuje. Sa druge strane, projekti kao mehanizam za sprovođenje strateških ciljeva uvek teže ka stvaranju što veće vrednosti (Willumsen i drugi, 2019; Laursen & Svejvig, 2016). Cilj ovog rada je da prikaže na koji način interdisciplinarnost doprinosi stvaranju vrednosti kroz projekte, spajajući koncept lanca vrednosti, odgovornog upravljanja i upravljanja projektima.

Vrednost i upravljanje vrednošću se posmatraju sa dva aspekta, „tvrđi“ aspekt vrednosti se primarno odnosi na smanjenje troškova, dok se „meki“ aspekt vrednosti odnosi na zajedničko razumevanje kriterijuma za postizanje vrednosti individualno za svaki projekat (Green & Sergeeva, 2019).

Koncept lanca vrednosti uveo je *Michale Porter*, sredinom '80, a svrha koncepta je analiza organizacionih aktivnosti kroz proznu primarnih aktivnosti i aktivnosti podršku. Koncept je do danas evaluario kroz primenu ne samo u poslovnom sektoru, već i u javnom sektoru.

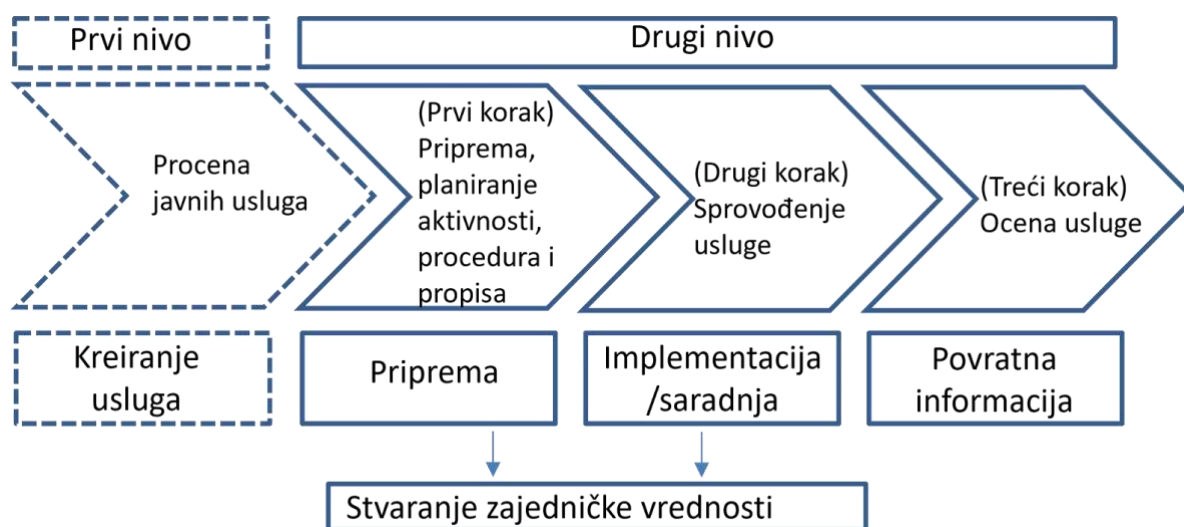
Koncept Stvaranja zajedničke vrednosti (*Creating Shared Value - CSV*) predstavljen je 2011. godine od strane Portera i Kramer (2011), sa idejom da kompanije da kompanije ne treba samo da odgovore na potrebe kupaca, već i na potrebe društva. U tom čak mogu naći mogućnosti za širenje na tržištu i kreiranje zajedničke vrednosti. Koncept zajedničke

vrednosti je u poslednje dve decenije zastupljen i kroz radove koji se bave menadžmentom u javnom sektoru (Heintzman & Marson, 2003). Primarne aktivnosti i aktivnosti podršku su prikazane na slici 1.



Slika 1. Lanac vrednosti u javnom sektoru (Heintzman & Marson, 2003)

U cilju stvaranja vrednosti, a posebno zajedničke vrednosti, organizacije mogu preispitati način korišćenja resursa, posebno prirodnih, kao i načina na koji nabavljaju potrebne resurse, koji mogu stvoriti koristi za lokalni ekonomski ekosistem (Porter & Kramer, 2011). Slika 2 prikazuje lanac zajedničke vrednosti u javnom sektoru.



Slika 2. Lanac zajedničke vrednosti u javnom sektoru (de Sá Medeiros & Forte, 2021).

U suštini lanac vrednosti predstavlja proces kojim se dolazi do vrednosti. Lanac vrednosti projekta može koristiti istu logiku.

Koncept koji danas zastupljen u različitim segmentima društva je odgovorno upravljanje. Odgovorno upravljanje postaje neminovno imajući u vidu ciljeve održivog razvoja, odnos nacionalnih ekonomija, kao i ekonomije i biznisa prema održivim rešenjima (Todorović & Obradović, 2023). U prilog razvoja ovog trenda govori sve veća zastupljenost Ekološkog, socijalnog i korporativnog upravljanja (Environmental, social, and governance - ESG), a na projektnom nivou brojnih standarda i praksi za održivo upravljanje projektima, kao što je GPM P5 standard za održivo upravljanje projektima.

Imajući u vidu navedeno, u nastavku rada je prikazano na koji način se može upravljati projektnim lanacem vrednosti na odgovoran način.

2. PROJEKTNNA VREDNOST

Vrednost u širem smislu predstavlja meru zadovoljenja potreba. Veliki broj autora se slaže da vrednost projekta ne treba posmatrati samo kroz ostvarene rezultate i krajnji proizvod, već i sa aspekta uticaja koje projekat ostvaruje (Winter et al., 2006b; Lepak, 2007; Vrečko & Lebe, 2013). Ključni koncepti za stvaranje projektnne vrednosti su prema Laursen i Svejvig (2016): strategija, vrednost, projekat, rezultat, uticaj/promena, koristi, stvaranje vrednosti, što čini projektnu vrednost veoma kompleksnim pojmom.

Jednu od definicija upravljanja vrednošću dali su Hayles i drugi (2010) – “process okrenut traženju rešenja u cilju unapređenja projektnne vrednosti, od inicijacije projekta do operative upotrebe”. Upravljanje vrednošću podrazumeva nekoliko faza: identifikaciju stejkholdera, analizu potreba i gep analizu, iznalaženje rešenja koje povezuje interese različitih stejkholdera, kreiranje opcija i analiza orpavdanosti, odlučivanje o izboru optimalnog rešenja, isporuka vrednosti i realizacija koristi od projekta (Obradović & Todorović, 2023).

3. PROJEKTNII LANAC VREDNOSTI

3.1. SAVREMENI TRENDVI U PROJEKTNOM OKRUŽENJU I PROJEKTNII LANAC VREDNOSTI

Potreba da se kreira kompetitivna prednost je postala posebno izražena sa Industrijom 4.0 (Bauer i drugi, 2018) i pojavom Industrije 5.0. Brzi razvoj i industrijska evolucija zahtevaju preispitivanje postojećih načina rada. Primena tehnologija u razvijenim zemljama je izuzetna, fokusirajući se na hibridne timove i uključujući robote u rad sa ljudima (Shehadeh et al., 2017). Takođe, primetne su promene u sistemu obrazovanja i razvoja kompetencija ljudi (celoživotno učenje, upotreba tehnologije koja otvara mnoge načine za učenje).

Sve ovo zahteva odgovorne poslovne prakse i aktivnosti (Palazzo & Wentland, 2011), uključujući odgovorno obrazovanje, održivost u ponašanju, efektivno upravljanje, odgovorne inovacije, transparentnost. Navedeno predstavlja samo deo šireg projektnog okruženja. Projektno okruženje čini dinamika organizacije u kojoj se sprovodi. Ključni elementi projektnog okruženja su i paralelno sprovođenje drugih projekata i drugih poslovnih aktivnosti, institucionalne norme, vrednosti i routine, tehnički kontekst projekta, ideje o post-projektnoj budućnosti (Todorović, 2013). Sve to dodatno utiče na kompleksnost upravljanja projektnim lancem vrednosti. Sa aspekta projekta, lanac vrednosti predstavlja mrežu fizičkih i pravnih lica, od kojih se kupuje ili kojima se isporučuju rezultati projekta (Martinsuo & Killen, 2014; Obradović & Todorović, 2023). U razmatranju projektnne vrednosti autori polaze od različitih interesa različitih stejkholdera. Ovo je posebno istaknuto u studijama koje se bave održivošću projektnih rešenja i održivim upravljanjem (Cvijović, Obradović & Todorović, 2021). U ključne aktivnosti ovog lanca, prema Lazar (2014) spadaju: mapiranje stejkholdrea, kategorizacija stejkholdera, analiza njihovih potreba i interesa, formalizacija ciljeva projekta, definisanje funkcija kojima se postižu definisani ciljevi i kreira vrednost i definisanje kritičnih faktora uspeha i indikatora performansi.

3.2. ODGOVORNO UPRAVLJANJE PROJEKTNIM LANACEM VREDNOSTI

Thompson i Williams su objavili članak pod nazivom “2021 je godina odgovornog upravljanja projektima (Thompson & Williams, 2021). Autori ističu da projektni menadžeri treba da razvijaju sposobnosti za pronalaženje mogućnosti da unaprede projektne rezultate i projektni uticaj u cilju stvaranje veće koristi za društvo.

Odgovorno upravljanje projektima se definiše kao koncept upravljanja projektima sa fokusom na dugoročne i kratkoročne nameravane i nenamerne uticaje projekta koje donose ekonomske, društvene i ekološke koristi. Odgovorno upravljanje projektima se smatra širim pojmom od održivog upravljanja projektima. Održivo upravljanje podrazumeva tri dimezije: ljude, životnu sredinu i profit i vrlo često podrazumeva balans ove tri dimezije. Uticaj na jednu dimenziju često znači zanemarivanje druge dve. Odgovorno upravljanje projektima teži ka razumevanju kako unapređenje jednog aspekta doprinosi unapređenje sistema i druga dva aspekta takođe.

Osnovni principi odgovornog upravljanja projektom su: svrha – kao razumevanje namere projekta i doprinosa koji projekat ima; svest o uticajima koje projekat ima i šta prouzrokuje; razumevanje potencijalnih konflikata i sukoba interesa; podržavanje promena, rezilijentnost u susret neizvesnosti; anticipacija različitih opcija za efikasnije odlučivanje; kreativnost u iznalaženju inovativnih rešenja; upravljanje očekivanjima stejkholdera i upotrebom prirodnih resursa na odgovoran način; balans između kratkoročnih i dugoročnih ciljeva, uzimajući u obzir ljude, životnu sredinu i profit (Thompson & Williams, 2018).

4. ZAKLJUČAK

Rad ukazuje na to kako kombinacija različitih koncepata može doprineti odgovornom upravljanju projektima lancem vrednosti. Rad je orijentisan na lanac vrednosti i na održiva rešenja koja stvaraju vrednost za stejkholdere. Ukoliko se principi odgovornog upravljanja inkorporiraju u aktivnosti projektnog lanca vrednosti, sam proces upravljanja može biti efektivniji.

Koncept odgovornog upravljanja projektnim lancem vrednosti podrazumeva uključivanje značajnog broja različitih koncepata i oblasti istraživanja. Model lanca vrednosti je inicijalno povezan sa strateškim upravljanjem, odgovorno upravljanje se sa svojim principima se oslanja na održivo upravljanje, inovativnost i predzetnički duh. Na osnovu navedenog, može se zaključiti da interdisciplinarnost ima značajnu ulogu u kreiranju održivih rešenja, značajnih za savremeno upravljanje projektima.

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ZNAČAJ INTERDISCIPLINARNIH *FUNDRAISING* PROJEKATA ZA JAČANJE FILANTROPSKIH VREDNOSTI JAVNO-PRIVATNIH PARTNERSTAVA

IMPORTANCE OF INTERDISCIPLINARY FUNDRAISING PROJECTS FOR STRENGTHENING THE PHILANTHROPIC VALUES OF PUBLIC- PRIVATE PARTNERSHIPS

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Apstrakt: Organizacije civilnog društva se osnivaju da bi služile interesima i potrebama svojih članova, i kao odgovor na određeni problem koji je u društvu uočen, a sa ciljem unapređenja neke oblasti. Načini prikupljanja sredstava ili *fundraising* predstavljaju osnovu funkcionisanja ovakvih organizacija, ali imaju i značajan uticaj na same filantropske vrednosti koje one zagovaraju. Rad obrađuje neke od osnovnih načina prikupljanja sredstava i finansiranja projekata, kao i motivaciju određenih grupa donatora za filantropiju, a sa posebnim fokusom na nacionalni kontekst Republike Srbije, kao i značaj udruživanja i sklapanja javno-privatnih partnerstava. Cilj rada je da ukaže na značaj donatorskih politika na filantropske vrednosti organizacija, te ukaže na značaj interdisciplinarnosti, multi sektorske saradnje i javno-privatnih partnerstava u rešavanju uočenih problema u društvu, te omogućavanje održivosti razvijenih programa servisa ili usluga.

Ključne reči: *Fundraising*, filantropija, interdisciplinarnost, organizacije civilnog društva, javno-privatna partnerstva

Abstract: Civil society organizations are established to serve the interests and needs of their members and to address specific societal problems to improve a particular field. Fundraising methods navigate the functioning of such organizations, but they also significantly impact the philanthropic values they advocate for. The paper explores some of the essential fundraising and project financing methods, as well as the motivation of certain donor groups for philanthropy, with a specific focus on the national context of the Republic of Serbia. It also emphasizes the importance of collaboration and public-private partnerships. This paper aims to highlight the significance of donor policies on philanthropic values of organizations, and to underscore the importance of interdisciplinary approaches, multi-sectoral cooperation, and public-private partnerships in addressing identified societal problems and ensuring the sustainability of developed service or program offerings.

Keywords: Civil society organizations, *fundraising*, interdisciplinary, philanthropy, public-private partnerships.

1. UVOD

Termin disciplina može imati različita značenja, označava specifičnu grupu znanja koja su jasno određena predmetom i metodom izučavanja, poput matematike, istorije, i drugih, dok sa druge strane isti pojam može da označava i uvođenje reda i kontrole unutar određene grupe. Sagledavanjem oba značenja u isto vreme, može se zaključiti da disciplina označava i uvođenje reda u određeni sistem znanja, a na osnovu koje on (sistem) ima moć (Moran, 2010). Sa druge strane, multidisciplinarnost i interdisciplinarnost nikako ne predstavljaju „uvođenje haosa“ i ukazivanje na slabe tačke određene discipline i sistema, već suprotno, ona predstavlja polaznu osnovu za šire i objektivnije sagledavanje problema, te iznalaženja rešenja. U interdisciplinarnim timovima svaki član tima pristupa određenom problemu polazeći iz svoje ekspertize, međutim izlaskom izvan granica discipline i usklađivanjem samih rezultata postiže se celoviti pristup rešavanju datog problema.

Organizacije civilnog društva (OCD), poznate još i kao udruženja građana (UG), neprofitne organizacije (NPO), nevladine organizacije (NVO), uglavnom se osnivaju da bi prvenstveno služile interesima i potrebama svojih članova, i kao odgovor na određeni problem koji je u društvu uočen, a kao krajnji cilj imaju unapređenje neke oblasti u kojoj deluju i tako doprinose široj javnosti (Tchirhath, 2006). Istorija udruživanja ljudi na prostorima današnje Srbije ima dugu tradiciju, a osnove se mogu pronaći u običajima mobe i zadrugarstva. Neke od prvih zabeleženih informacija o udruživanju su sa kraja 19. veka, dok se termin "nevladine organizacije" prvi put pojavljuje 1870. godine u listu Glas javnosti (Milivojević, 2006).

Iako istorija organizacija civilnog društva ili nevladinih organizacija nije kratkog veka na teritoriji Republike Srbije, jedan od najvećih izazova sa kojim se one najčešće suočavaju je pitanje održivosti i finansiranje. Ovaj tip organizacija su neprofitne organizacije, a jedan od osnovnih motiva zbog kojih se osnivaju su filantropija i pomoć zajednici u rešavanju određenih problema. S obzirom na to da su to pre svega neprofitne organizacije, osnovni vidovi za finansiranje OCD predstavljaju prikupljanje sredstava kroz različite vidove podrške. Izraz prikupljanje sredstava ili veoma ustaljen anglicizam *fundraising*, uticajem savremenih tehnologija sve više je prisutan u javnom diskursu, a osim za finansiranje organizacija sve više se na globalnom nivou koristi i u svrhu finansiranja pojedinaca. *Fundraising* suštinski označava veštinu kojom se drugi ljudi privole i „ubede“ u vrednosti delovanja određene ideje i/ili organizacije, a u svrhu dobijanja različitih vidova podrške (finansijska sredstva, prostor, medijska promocija, itd.)

Postoji širok spektar donatora koji bi potencijalno mogli da budu zainteresovani za određeni problem za koji se prikupljaju sredstva, a motivacija za uključivanje u akciju i pružanje podrške predstavljaju jedan od osnovnih postulata za *fundraising*-a. Neki od osnovnih izvora davanja bi bili: pojedinci, država (nacionalni, regionalni i lokalni nivou), međunarodna donatorska zajednica i korporacije (Norton, 2009).

2. OSNOVNI PRINCIPI I IZVORI PODRŠKE *FUNDRAISING* PROJEKATA

Prikupljanje sredstava označava veštinu i način kojim se drugi ljudi ili organizacije „ubede“ u vrednosti delovanja određene ideje, a sa ciljem dobijanja različitih vidova podrške za sprovođenje te ideje. Međutim, razlozi zbog kojih pojedinci i grupe odluče da postanu filantropi, odnosno dobrotvorni donatori tj. darodavci su različiti. Bitno je napomenuti da filantropija ne podrazumeva samo finansijske donacije, već ona obuhvata i donaciju u vidu svih drugih resursa, poput medijskog izveštavanja o određenoj temi, a sa ciljem dopiranja do šire publike i podizanja svesti o datom problemu. Takođe, donacija može biti i u vidu

besplatnog korišćenja prostora, robnih donacija, određenih usluga, ali i u vidu ljudskih resursa, odnosno volonterskog posvećivanje vremena određenoj organizaciji zarad viših ciljeva. Ovo je posebno bitno istaći kako se ne bi umanjio značaj donacija osoba koje su slabijeg ekonomskog statusa, jer ima puno primera gde su se osobe nižih primanja i nepovoljnijeg položaja pokazale velikodušnim. Još interesantniji je podatak istraživanja Catalyst Balkan (2021), regionalne fondacije koja se bavi izgradnjom filantropskog ekosistema na Balkanu, da se u Srbiji generalno beleži rast davanja pojedinaca u odnosu na kompanije i taj odnos je u 2021. bio 60:33.

Motivacija da neko postane filantrop može imati korene i u narodnoj kulturi, a to se najbolje ogleda u izreci „dobro se dobrim vraća“ koja odražava opšti moralni princip da će onaj koji čini dobro biti nagrađen. Takođe, razlozi za filantropiju mogu da se sagledaju i u osnovnim načelima razmene. Darivanje predstavlja oblik razmene koji stvara društvene veze i obaveze među ljudima, i ono nije jednosmerna akcija, već je uključuje uzdarje (Mos, 1998). Darivanje ne predstavlja samo ekonomsku transakciju, već i složenu društvenu i simboličku praksu, kojom darodavac stvara vezu s primaocem dara, ali ujedno i stvara obavezu da se uzvрати darom ili nekom vrstom uzdarja, što u slučaju *fundarising* podrazumeva obavezu transparentnog i namenskog korišćenje dara, odnosno sredstava koja su data na raspolaganje, a u svrhu viših ciljeva. Darivanje isto kao i filantropija imaju dublje društveno značenje koje prevazilazi samu ekonomsku vrednost određenog dara, i mogu imati važnu ulogu u održavanju društvenih struktura i identiteta. Suština dara i uzdarja leži u tome da se putem ovih oblika održava društveni red, međusobna povezanost i solidarnost (Mos, 1998).

Izvori finansiranja organizacija civilnog društva mogu biti različiti, a ispod su predstavljeni neki od osnovnih načina prikupljanja sredstava.

Finansiranje najrazličitijih inicijativa OCD kroz individualne donacije čini preko 70% sredstava koje se izdvajaju za finansiranje neprofitnih organizacija (Norton, 2009), u Srbiji je taj broj u porastu iz godine u godinu. Motivacija za davanje sredstava leži u različitim ličnim razlozima, poput prepoznavanja određenog problema koji treba adresirati, ličnog odnosa ili poznanstva/prijateljstva sa nekim ko ideju, odnosno projekat sprovodi u delo, ali i putem članstava ili pripadnosti nekoj određenoj dobrotvornoj ili filantropskoj organizaciji, ali može imati i druge lične porive poput želje za priznajem dobrotvornog rada, donacije i drugo.

Sredstva specifičnih namena mogu da imaju svoje uporište i u međunarodnoj donatorskoj zajednici. Međunarodni razvoj i saradnja najčešće se finansira kroz multilateralnu pomoć i različite međunarodne razvojne agencije (Norton, 2009) kao što su Ujedinjene nacije, Delegacija Evropske unije, Savet bezbednosti i druge. Ovakve agencije podržavaju ideje i projekte zemalja koje su članice ovih organizacija, ili su kandidati za pristupanje u članstvo. Pored pomenutih organizacija koje sve deluju u Srbiji, postoji i veliki broj drugih međunarodnih ili regionalni organizacija u čijem su portfoliju aktivnosti između ostalog i donatorske politike. Međutim, kada je reč o određenim međunarodnim donatorima i sredstvima koje se daju u specifičnu namenu, neophodno je napomenuti da veliku ulogu u „otvaranju“ određenih grant šema ima i sama država. Naime, neke od ovih velikih donatorskih organizacija poput Evropske komisije raspisuju donatorske programe sa ključnim ciljevima na koje je program usmeren na period od 5 ili više godina, a na državama članicama, ili državama kandidatima za članstvo je da „izraze želju“ za učestvovanje u datom programu. Upravo u ovome leži i jedan od značaja javno-privatnog partnerstva između neprofitnih organizacija i javnog sektora. Neretko su neki od problema koje OCD uoče van fokusa donosioca odluka na državnom nivou, te se može desiti da država ne „potvrdi

interesovanje“ za učešće u različitim programima finansiranja Evropske komisije, a na taj način zatvori i mogućnosti da organizacije iz Srbije apliciraju na konkurse u okviru te programske šeme. Pored prethodno navedenih izvora finansiranja, neophodno je napomenuti i fondacije, odnosno privatne fondove, a čije su programske aktivnosti najčešće povezani sa primarnim oblastima od značaja osnivaču. Jedan od primera ovakvih fondacija u svetu je Elton John AIDS Foundation, koju je 1992. godine osnovao pevač Elton Džon, a čiji je osnovni cilj podizanje svesti, prevencija i pomoć osobama koje žive sa HIV/AIDS-om širom sveta. Pored fondova, postoje i legati i privatne zadužbine kao vid fondacija koje programske oblasti finansiraju po osnovu prihoda ostvarenih vlasništvom nad pokretnom i nepokretnom imovinom i novcem.

Vredi spomenuti i fondacije državnih organa, a koje najčešće doniraju preko razvojnih agencija, ministarstava spoljnih poslova i ambasada, poput ambasade SAD, Norveške, Nemačke, Japana i drugih. Pored navedenih postoje i fondovi političkih partija, ali i religijski fondovi koji se najčešće bave socijalnim i ekonomskim pitanjima, a neki od primera su International Orthodox Christian Charity, Catholic Relief Service, ili na lokanom nivou Dobrotvorna fondacija Srpske pravoslavne crkve Čovekoljublje.

Sa druge strane motivacija kompanija za filantropskim davanjima najčešće leži u potrebi za poštovanjem društveno odgovornog poslovanja, (engl. Corporate Social Responsibility/ Sustainability and Corporate Social Responsibility). Prema tumačenju Evropske komisije (2023), društveno odgovorno poslovanje se odnosi na odgovornost kompanija da utiču na društvo. Uticaj koji kompanija ima može biti i pozitivan i negativan, a odnosi se na sve aspekte poslovanja u celini. Međutim, s obzirom na to da je u nekim slučajevima teško sagledati motive kompanijske filantropije, neki autori smatraju da je zapravo jedan od osnovnih motiva građenje pozitivnog imidža o kompaniji, kako kod potrošača, a tako i kod države (Peterson, Van Landuyt, & Pham, 2021). Korporativna i kompanijska filantropija se smatra potencijalnim oruđem za izgradnju odnosa sa kreatorima politika (Fooks & dr., 2013), podstičući prijateljski tretman. U prilog ovome govori i to da različite države podstiču kompanije da se bave društveno odgovornim poslovanjem u državama u kojima je privatni sektor nedovoljno razvijen, javna sredstva usmeravaju indirektno ka privatnim institucijama kroz poreske olakšice ili druge vidove pomoći, a u državama sa razvijenim privatnim sektorom koji ima značajniju ulogu, javna sredstva se usmeravaju ka privatnom kroz kombinaciju direktnih i indirektnih mehanizama (Salerno, 2004).

Način doniranja zavisi i od toga na koju su temu usmeri projekti i akcije, ali i koja je ciljana grupa koja se sa određenim problemom najviše suočava. S tim u vezi, pitanja ekologije, rodne ravnopravnosti i uopšteno zaštite ljudskih prava mogu biti od većeg interesa mladim ljudima, dok su stariji u većoj meri usmereni na pitanja zdravlja, socijalni zaštite i drugo (Norton, 2009). Konačno, kod prikupljanja sredstava, a posebno prikupljanja individualnih donacija pored samog problema koji se rešava, bitna je i geografska lokacija, je su ljudi spremniji da doniraju sredstva za nešto što im je blizu, i čiji će rezultat moći lakše i brže da sagledaju. Da bi se neko zainteresovao da donira, neophodno je jasno definisati tačno koliko je novca potrebno prikupiti, potencijalno i koliko znači pojedinačna donacija, te omogućiti transparentnost u trošenju donacije. Lokalne i nacionalne vlasti najčešće imaju definisane prioritete kroz različite strategije, razvojne programe, akcione planove i politike (Norton, 2009), a mnogi od njih su i motivisani prilagođavanjem sa različitim međunarodnim aktima, ili Ciljevima održivog razvoja Ujedinjenih nacija. U ovim slučajevima već su unapred razrađene konkursne procedure i rokovi, kao i tematske oblasti na koje se pozivi usmeravaju. Podrška se najčešće pruža u vidu granta, odnosno bespovratnih sredstava, honorara, ustupanja resursa ili čak uspostavljanje javno-neprofitnog partnerstva. U slučaju kompanijske

filantropije, donacije kod međunarodnih kompanija mogu biti motivisane i ulaskom kompanije na nove tržište te u svrhu pozivne izgradnje brenda.

3. ZNAČAJ JAVNO-PRIVATNIH PARTNERSTAVA

Javno-privatna partnerstva (JPP) nastaju kada se dve ili više organizacija koje su iz javnog i/ili privatnog sektora (a među kojima mogu da budu i OCD) udruže zarad započinjanja novog odnosa saradnje, zasnovanom na uzajamnom poverenju i jednakosti, a ne hijerarhijskim strukturama (Naoum, 2003). Javno-privatna partnerstva mogu da se smatraju i sredstvom koje stvara veze među različitim akterima (Sastre Merino & De los Rios-Carmendo, 2012), ali podrazumevaju da se rizik, obaveze i resursi dele, te stvaraju sinergiju među dve ili više organizacija, a sa ciljem prevazilaženja i odgovora na određene probleme (McQuaid, 2002). JPP samim tim mogu da budu i zasnovana na saradnji više organizacija i institucija različitih sektora, te otvaraju prostora za kombinaciju disciplina, znanja i resursa kako bi se došlo do cilja.

Značaj saradnje OCD i javnog sektora ogleda se između ostalog i u tome da je OCD „lakše“ da dosegne do određenih ranjivih društvenih grupa, ali i u tome, kako objašnjava NVO Re Generacija (2021), da određene društvene grupe poput žrtava nasilja usled neadekvatne reakcije sistema imaju veće poverenje u organizacije civilnog društva i aktiviste. Takođe, s obzirom na to su članovi određenih OCD upravo i sami pripadnici ključnih populacija ka kojima su servisi ili usluge projekta namenjen, te neposredan kontakt sa predstavnicima datih populacija omogućavaju nevladinom sektoru „žive“ informacije te direktniji uvid u potrebe i probleme sa kojima se ta populacija suočava u gotovo realnom vremenu. Stoga, javni sektor često koristi podatke dobijene od OCD, kao i rezultate istraživanja, te uska sprega koja postoji, ili bi barem trebalo da postoji između OCD i javnog sektora, može da predstavlja i neiscrpnu bazu ideja za javni sektor i vladu jedne države (Brooks, 2002). Ukoliko ostanemo na primeru vulnerabilnih grupa i borbe za ljudska prava, uočavamo još jednu bitnu odliku *Fundraisinga*, a to su lobiranje i zastupanje. Ove tehnike pored toga što se koriste u svrhu pridobijanja poverenja donosioca odluka da se određeni programi realizuju, te predstavljaju osnov za početak partnerstava između donatora i nosioca projekta, predstavljaju i bitnu kariku za podizanje svesti o određenim problemima sa kojima se neke ranjive populacije suočavaju, a koje iz različitih razloga same ne mogu da iznesu probleme u javnost, kao što su na primer, deca, stari i nemoćni, bolesni, ali i prekršioci zakona i druge višestruko ranjive grupe.

Organizacije civilnog sektora mogu da imaju velikih koristi od JPP, a između ostalog ova partnerstva mogu da donesu i stabilne izvore finansiranja organizacijama, ili samim servisima i uslugama koje one pružaju. Na ovaj način smanjuje se mogućnost da pojedini servisi i usluge postoje samo dok traje određeni projekat, već bi se uticalo na održivost samih programa. Ovo je značajno za projekte koje adresiraju neki specifičan problem, sa kojim se suočava „manji“ broj osoba, a koji određene usluge i imaju samo dok je grant aktivan. Iako je jedna od stavki koja se u većini projektnih predloga popunjava i način održivosti projekta i usluga, u praksi se suočavamo sa tim da u zavisnosti od usluge na koju je projekat usmere, ukoliko je nosilac usluge jedna organizacija, ta usluga pre ili kasnije „zamre“ jer uz svu dobru volju i entuzijazam, za održivost su neophodne različite vrste resursa. Zato je od velikog značaja interdisciplinarnost, ali i multisektorska saradnja u ovakvim projektima gde svaki od aktera donosi novi pogled, odnosno potencijalno rešenje datog problema. Primera radi, u slučaju usluga namenjenih ženama žrtvama nasilja, neophodno je uključiti sve zainteresovano strane, među kojima su pored samih žena i aktivista, neophodno uključiti i

donosiocima odluka, ali i svih drugih relevantnih strana poput centara za socijalni rad, zdravstvenih ustanova, policije, ali tužilaštva i sudstva.

4. ZAKLJUČAK

Interdisciplinarni *fundraising* projekti imaju značajnu ulogu i predstavljaju bazu za jačanje multisektorske saradnje i ostvarivanja JPP. Umrežavanjem i razmenom iskustva i stavova aktera više različitih organizacija postiže se jačanje kapaciteta i unapređenje kompetencija uključenih organizacija, ali povećava verovatnoća za uspeh određenog projekta i omogućavaju bolji rezultati, veći odjek, ali i sveobuhvatnije usluge. Interdisciplinarni pristup ima uticaj i na sam *fundraising* s obzirom na to da sama ideja može biti povezana i prepoznata od više različitih grupa potencijalnih donora, ali i može ulivati dodatni osećaj sigurnosti da će uložena sredstva biti iskorišćena na adekvatan način. Javno-privatna partnerstva kod ovakvih projekata mogu značajno doprineti omogućavanju održivosti određenih usluga i servisa, uticati na promene politika i stavova donosioca odluka, ali i pomažu da građani i određene grupe ljudi imaju veće poverenje u javne institucije. Organizacije civilnog društva se baziraju na altruizmu i filantropiji, u zavisnosti od teme kojom se bave, te pojedinci mogu imati veće poverenje u njihov rad i radije se opredeliti da doniraju novac i vreme ili lobiraju za ostvarivanje njihovih ciljeva. Sa druge strane, partnerstvo među organizacijama i javnim institucijama imaju pozitivan uticaj i na drugu grupu osoba koje možda imaju manje poverenje u OCD, te im partnerstvo garantuje da će sredstva koja doniraju biti adekvatno utrošena. Takođe, mnogi donatori na nacionalnom, ali i na globalnom nivou kao jednu od stavki upravo prepoznaju jačanje odnosa i ostvarivanje partnerstva između donosioca odluka i neprofitnih organizacija. *Fundraising*, ima pozitivan uticaj i na rast filantropije među ljudima i organizacijama, koje prepoznaju značaj određenih ideja i odlučuju da ih podrže, međutim donatorske politike mogu imati i negativan uticaj na filantropiju određenih organizacija ograničavanjem donacija koje se usmeravaju samo na određeni tip usluga iz portfolija.

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STUDY OF INTERNAL COMMUNICATION CHANNELS IN PROJECT MANAGEMENT IN RUSSIAN ORGANIZATIONS

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Abstract: Currently, project management is continuously developing and becoming an integral part of all management processes in modern companies. Analyzing various scientific papers on the topic of communications in project management, it was noted that such studies are practically absent in Russian companies, while such studies have been conducted in foreign organizations. The purpose of this study is to test the hypothesis that internal communications are a prerequisite for achieving the goals of the project. Under the influence of digitalization and in the period of remote work during COVID-19 organizations had to master new technical tools of communication, the research task was to identify the methods and means of internal communications used by Russian companies nowadays. The article describes the results of a survey among 156 specialists who are involved in the development and implementation of projects and programs in state and municipal authorities, large state and commercial organizations, and small businesses. In conclusion, general recommendations are given to improve the internal communication process of the project.

Keywords: *internal communications, project management, project team, communication tools, intra-team interaction.*

1. INTRODUCTION

Communication is the most important process in our daily life, and the whole world revolves around it. Communication in the project is an important tool in the field of management. Team communications start working from the first day of work on the project and continue throughout the duration of the project.

The definition of the concept of "communication" is very multifaceted, the authors have not yet come to a consensus about this term. However, generalizing a lot of concepts, the following definition of "communications" is highlighted. Communication is the acquisition, accumulation, synthesis and classification of the required information, as well as the actual exchange of it for the implementation of competent decisions (Vasiliev, 2021).

Internal communications in project management are divided into communication as a process, as well as communication as a phenomenon. Communication as a process is a direct relationship between the employees involved in the project, the company's staff, as well as all stakeholders. Meanwhile, communication as a phenomenon is the interaction of structural units with project management participants on the basis of developed instructions, such as the company's charter or the charter of projects in which communications take place, the company's regulatory legal acts, regulations introduced in the organization, as well as other documents that can be adopted in the company or project for regulation of internal communications (Moseeva & Skopin, 2011).

Communication in projects is considered as a strategic link that helps to build a bridge between an organization and individuals temporarily involved in project work to achieve business goals.

At the present stage of management development, it is impossible to imagine a manager who ignores such a necessary subsystem as "communications management". Only having communication skills among their competencies, a manager can achieve goals and successfully implement projects.

Communication management is one of the most important areas of knowledge in project management. Without communication management, it is impossible to create a project management plan, create a cohesive team that will be motivated to successfully implement project activities. Without established communication between team members, failures will occur much more often, which can lead to negative consequences for the entire project as a whole.

The purpose of internal communication in projects is to ensure an effective flow of information between various departments and team members.

Effective internal communications are a very important mechanism for any project, and should occur from top to bottom, from bottom to top and horizontally.

2. LITERATURE REVIEW

2.1. TYPES OF TEAM COMMUNICATIONS IN PROJECT MANAGEMENT

In the process of interpersonal communication, a certain impact is carried out, the influence of participants on each other. Interpersonal communication is characterized by a number of signs:

- interpersonal communication is inevitable and inevitable, because a person is primarily a social organism that cannot exist without communication. That is why the consideration of communications is so important for project management and management in general;
- during interpersonal communication, the subjects of communication always receive a response to the information received, feedback and responses from each other. Interpersonal communication is impossible without answers;
- the main difference between interpersonal communications from others is multi-channel. Due to the fact that their implementation is possible only in offline space, communication participants can transmit information through several parallel channels: sight, hearing, touch, smell, as well as some intuitive channel that allows you to assess the relationship of communication participants to each other, for example, interpersonal distance.

The function of interpersonal communication is to revise the opinions of participants, modify ideals, as well as re-evaluate values and change the way of action (Petrova, 2011).

In modern companies and project teams, negotiations are the most popular form of interpersonal internal communications. This form is universal in that all interested participants can take part in the interaction process. The importance of such communication lies in reciprocity, not only the head interprets various organizational and other issues, but also subordinates actively participate in the dialogue.

Thanks to effective internal interpersonal communications, the project team manages to feel the organizational culture and strategic goals more fruitfully.

When employees know about the changes taking place in the company, about the decisions being made in the project team, about various events in the organization, resistance to change

is reduced, communicating with each other, the impact in the team increases (Boldyreva, 2018).

Another type of communication, distinguished by subject and means of communication, is communication using information technology, technical means. In modern society, in order to remain competitive, it is necessary to use digital means of communication. The field of project management is no exception. In addition, the use of digital technologies for communication is important not only for clients and other external communications, but also for communications within the project team (Pomortseva & Alieva, 2018).

Informal communications play a special role in any project. They are more diverse than formal ones, since they are based on private ideals, principles of each member of the project team. Informal communications are expressed through a kind of social network in which discussions take place, and if you do not control the channels of informal communications, the team's productivity will decrease. Conversely, with proper control, informal communications will have a positive effect on project participants (Pavlov & Kiriy, 2021). As an example of informal communication, we can cite the so-called "grapevine" - informal channels, without which no organization can do.

Any type of communication is carried out through the communication management process. Within the framework of the project, three main communication management processes can be distinguished, which include planning, management itself and monitoring. This process should occur periodically, contributing to finding flaws and gaps in the early stages, so that in the end it does not lead to failure (Kim, 2012).

3. EFFECTIVE INTERNAL COMMUNICATIONS AND THE PROBLEMS OF BUILDING THEM

Due to the competent implementation of the communication process, the efficiency of project execution increases. At the same time, the following signs of effective internal communication can be distinguished (Boldyreva, 2018): informative, clarity, timeliness, independence and impartiality, conciseness.

It can be stated that, first of all, effective communication increases the motivation of team members in the project. In the process of work, mutual trust and support is built between the members of the project team, and it is also useful for the development of relations between management and subordinates.

The next aspect is that effective communication contributes to the fact that the project manager can monitor the progress of the project and adjust the work schedule more quickly. It also helps to ensure discussion, effective search for solutions and rapid transfer of information between members of the project team.

Thirdly, fruitful communication affects the quality of project management solutions. The implementation of large projects is a time-consuming process, during which a number of difficulties may arise. The result of productive communications is feedback from both project managers and other project team members. When all members of the project team listen and hear each other, information is received much more quickly, the process of making managerial decisions is faster, and when more information is received, the risks of making incorrect managerial decisions are reduced.

Fourth, it is only with the help of successful communications that a qualified project team can be created. Of course, without the necessary knowledge, proper experience, qualifications and other required qualities, it will not be possible to implement the project, but since live employees do the work, not artificial intelligence, communications also play a fundamental role. Since the accumulated knowledge, experience and competencies of all participants are different, with the help of communications, it is easy to integrate employees according to their competencies to their respective tasks.

If a manager pays enough attention to informal communications in relation to the rest of the team: acts as a psychologist, emotional leader, and also promotes team cohesion through organizational culture – the team copes with difficulties faster, resistance to change decreases. In general, such teams are more stable in relation to those in which such communications are not carried out.

In most cases, unproductive or ineffective communications entail unforeseen expenses. This is due to the fact that, as is often the case, two project teams are involved in the implementation of the project. And when there is no established connection between them, the results of their activities may be contradictory in relation to each other. If such a situation arises, it certainly leads to an increase in deadlines, budget and conflicts, not only between the project teams, but also with the project customer. If conflicts are not resolved in time and communication between project participants is not established, employees may lose the incentive to work or even quit without completing their work, since not all people can work in a conflict-tense environment.

Failures in projects in many cases arise due to communications, namely due to their insufficiency or poor level (Kuznetsova et al., 2021).

Next, the obstacles to the implementation of effective communications are considered. Knowing them, the project team leader will be able to resolve many of them and establish effective communication in his project team:

- Lack of accurate information. One of the main problems when it comes to communication is that the message is not specific or clear. The lack of information causes confusion and frustration among employees, which will negatively affect their work (Minchenko & Yakovleva, 2015).
- Vague instructions, lack of detailed steps, and similar problems encourage team members to commit to performing various jobs or tasks, unnecessarily. The task of the project manager is to disclose the project parameters as clearly as possible.
- Information overload.
- Cultural differences.
- Generational difference. For example, millennials and Generation Z are leaning towards instant messaging and texts as their main communication methods, which have become easier in the digital revolution. Meanwhile, baby boomers tend to prefer traditional ways of communicating, such as phone calls, emails, and face-to-face conversations. These preferences need to be taken into account in the current multi-generational workforce.
- Problems with structural design. This problem can be caused by physical barriers to communication, such as poor information systems, old computers, and the like.
- Lack of feedback. According to a study conducted by Gallup (Harter, 2022) without customized feedback, companies lose up to 1/5 of profits per year. It is necessary to

set up continuous feedback systems in the project team, because thanks to such a built-up system, the involvement of project team members increases, and productivity also increases with it. The study also noted that for successful leadership it is necessary to give feedback regularly.

- The emotional component. It is commonly believed that most often, a person is rational, and most decisions are primarily motivated by analytical considerations, but the truth is that emotions play a key role in the vast majority of various actions and decisions. A person's emotional state can create barriers within a team, especially if there are negative emotions towards each other (Sotnikov, 2016).

4. RESULTS

Thanks to the development of digital communications in project management, it has become possible to create virtual project teams. When such teams work, the costs of creating jobs in the office are reduced, since thanks to digital means of communication, it is not necessary to be in the workplace with each other, it is enough to be in touch through the required technical equipment: messengers, e-mail, special applications. There are also disadvantages of virtual teams, such as: lack of live communication (since employees are primarily living people who, according to their psychophysiological needs, need real communication); with a higher speed, fatigue from work may occur, and without proper control, some participants may be found to be avoiding responsibility. According to the Bitrix 24 analytical center, 4/5 companies out of almost a thousand respondents use remote work opportunities, that is, they resort to using technical means to establish communications (Lapteva, 2020).

Among electronic means of communication, the most popular in Russia as of 2016 were the tools presented below (Sotnikov, 2016) (where 1-10 are rating places):

- 1 - Bitrix24
- 2 - Jira
- 3 - Asana
- 4 - ActiveCollab
- 5 - Slack
- 6 - Wrike
- 7 - MS Project
- 8 - Evernote
- 9 - Trello
- 10 – Basecamp

However, under the influence of sanctions and the policy of switching to domestic software, a survey conducted in a group of project management practitioners and professionals in the telegram channel in January 2023 showed the following results, described below. 156 respondents took part in the survey. To the question "what Russian software do you use for project management?" the respondents answered the following:

44% - do not use Russian software or use foreign programs;

18% - use software developed in the company;

17% - use Bitrix24;

5% - 1C project management;

5% - Yandex.Tracker;

3% - Advanta;

3% - YouGile;

5% is different.

Bitrix 24 is a system created in Russia for the purpose of organizing the company's activities, including the work of project teams. It has a large list of possibilities, including opportunities for establishing effective communications. Bitrix 24 allows you to hold online conferences, chat, and create groups for convenient communication.

Having familiarized with the topic of internal communications, it became clear how important they are for successful work. A lot of materials have been published on this topic by foreign authors, various statistics related to internal communications are given (Wang et al., 2021). However, in Russia there is practically no statistics on the demand for internal communications, about their importance. Therefore, a survey was conducted to find out the missing information about communications.

Another survey was conducted in the format of a focus group of 12 people, which consisted of specialists involved in project management and having experience in this field.

It became clear to the top priority that internal communications undoubtedly occupy an important place, because the question "How important are internal communications for the organization?" was answered one hundred percent "Are a necessary condition for achieving the tasks facing the organization."

In addition, more than half of the respondents noted that the communication process within the project team takes more than 50% of the project.

The top 3 tools for communication in the project are: personal contacts (face-to-face), meetings (face-to-face), as well as correspondence in messengers.

To the question "What is your attitude to the use of messengers and/or social networks for communication in the project team?" the most popular (more than 80% of respondents) was the answer "I consider an effective way of communication and actively use it".

Also, 10 out of 12 participants noted that the work can be carried out more productively if it is possible to promptly receive additional information from colleagues. This once again confirms the importance of competent building of internal communications of the team.

The block of questions about interpersonal relationships in the team also confirms foreign studies. For Russian employees, personal relationships are important and acceptable for 100% of respondents, however, all respondents replied that they maintain a conversation with colleagues on topics that are not related to their work and have a positive/neutral attitude to discussing personal life that is not related to work with their colleagues.

In addition, respondents were asked an urgent question about the specifics of communications during the transition to remote work in connection with the COVID-19 pandemic, which sounded like: "Did you take part in the discussion of the measures that need to be taken by the management of the organization during the period of remote work?" as a result, it turned out that the authorities promptly responded to the changing situation. 75% noted that communication was carried out, taking into account the peculiarities of remote work.

The survey conducted at the focus group shows us that in Russian companies, the management of internal communications of the project occupies an important place. Interpersonal communication as well as formal communication is important for employees.

Communication is necessary both offline and online. Thanks to the results obtained, it became clear how necessary it is to devote a sufficient amount of working time to internal communications and their proper planning.

5. CONCLUSION

Thus, the article considered various aspects of internal communications in the project: types, effective communication processes and their problems, conducted a survey and presented the results, as well as recommendations for achieving effective communications

Summing up all of the above, we would like to note that the importance of internal communication lies in the fact that competently structured interaction by a member of the project team is a prerequisite for the successful implementation of the project. Effective project communication management means that all areas of communication work at an optimal level.

With the help of effective internal communications, the project team implements its activities more productively and fruitfully, solves issues arising during the implementation of the project more quickly. The project team is a collection of not only competent employees, but also individuals with their own mental characteristics, psychological differences, for the effective activity of which the manager must always remember the importance of the role of internal communications in the project.

Understanding how to correctly identify the cause of communication problems and how to correct behavioral changes or systematic changes to ensure optimal communication channels can show the difference between a failed project and a successful one. Thus, creating a solid foundation for effective communication is the key to ensuring the success of your projects.

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THE ROLE OF ETHICS IN INTERDISCIPLINARY DIGITAL TRANSFORMATION: ACHIEVING EXCELLENCE THROUGH STAKEHOLDER COOPERATION AND SMART TECHNOLOGIES

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Abstract: Technology has never been neutral, and public concern is growing about the ethical status of emerging technologies such as AI, machine learning, and the Metaverse. Company CEOs are increasingly aware that a focus on digital transformation and the profit alone is not attractive to investors, and they are emphasizing the ethical public image and long-term sustainable value of their investments. While fundamental ethical principles have stood the test of time, there is a need to assess their applicability in the digital world. According to the ACCA survey on Ethics for Sustainable AI Adoption in 2021, the majority of respondents agreed that leaders in their organization prioritize ethics as highly as generating profits, and many have implemented an ethical framework for AI in their organization. However, is this sufficient for a sustainable and ethical digital future? To explore this question, the author conducted a survey to understand the actuality of ethics in the digital world, the use of ethical principles in digital economics, the need for regulations, and the importance of corporate ethical labeling. Based on feedback from 169 survey participants, this paper discusses key findings and suggests possibilities for further research.

This paper could be discussed under the theme of interdisciplinary projects since it addresses the specific focus on ethics in digital transformation through projects and emphasizes the integration of smart technologies within interdisciplinary contexts.

Keywords: Business Ethics, Ethical Companies, Ethics in Digital, Ethics in Project Management

1. INTRODUCTION: ETHICS RE-EMERGING

Technology has never been neutral. Every step forward in technology opens exciting new opportunities but also brings up new challenges, discussion points, and risks. There is growing public concern about the ethical status of technology, with topics such as AI, especially ChatGPT, and machine learning, Metaverse, facial recognition, autonomous vehicles, data breaches, user privacy, general issues related to living in the digital world, and the impact on the environment being widely discussed.

In the increasingly digitalized world, ethics is shaping its place as a crucial aspect of business strategy. Companies driven by profit alone are no longer attractive to investors, and CEOs are focusing on the ethical public image and sustainable long-term value of their investments. The most ethical companies worldwide, including Allianz, IBM, Microsoft, L'Oréal, Kimberley-Clark, LinkedIn, and Capgemini, have been recognized several years in a row by the Ethisphere Institute. The institute recognizes companies' performance in terms of ethics, compliance, and leadership teams and refers to the proven connection between good ethical practices and financial performance (Ethisphere Institute, 2023).

An ethical image is good for business, while unethical behavior can be harmful. Nestlé, Coca Cola, and Amazon are some of the most unethical companies globally (Ethical Consumer, 2022), and Google has also been accused of unethical behavior by its former head of Google's Ethical AI Group (DAIR Institute, 2021). Analysts at Deloitte have identified ethical tech as one of the imperatives driving digital transformation (Deloitte, 2021).

The impact of ethics on corporate decision-making has been studied by the World Economic Forum, which found that leaders are aware of their companies' influence on broader society and that ethical decisions are strongly deliberate (World Economic Forum, 2020). Similarly, the ACCA Association of Chartered Certified Accountants conducted a global coverage survey that found that the majority of leaders prioritize ethics as highly as generating profits (ACCA Association of Chartered Certified Accountants, 2021).

Both surveys point to the importance of leaders and decision-makers in corporate ethics. Ethics is a people's skill, and ethical companies require leaders capable of implementing ethical principles in daily decisions and operations.

This brings the author to the research question of this paper: investigating the role and significance of ethics in the process of corporate digital transformation and its impact on organizational behavior and stakeholder perceptions.

2. ETHICS IN BUSINESS

Ethics is a subject that consists of two major branches: theoretical and applied ethics, with business ethics being the most significant part of the latter (Gülcan, 2015). According to experts, ethical principles in the business refer to the moral standards set by a company as a whole and its individual employees. These principles take into account the values, standards, regulations, and industry norms that dictate how people conduct themselves in the workplace and how a business operates in the community (Indeed, 2023). Therefore, it is crucial for company leaders not only to be familiar with the ethical principles in their organization but also to comply with them.

2.1. PRINCIPLES

The fundamental principles vary slightly across different business fields. The Code of Conduct for professional accountants, for instance, establishes the standard of behavior expected of a professional accountant and reflects the profession's recognition of its public interest responsibility. The principles of Integrity, Objectivity, Professional Competence and Due Care, Confidentiality, and Professional Behavior are emphasized by the International Federation of Accountants IFAC (International Federation of Accountants, 2018). As per the IFAC, professional accountants play a key role in helping organizations navigate technological changes in an ethical manner. To do so, they must understand how to respect technology's double-edged sword—actively pursuing opportunities while safeguarding against challenges (International Federation of Accountants, 2023).

Similarly, the Scaled Agile Framework (SAFe) emphasizes core ethical values such as transparency, honesty, integrity, accountability, and responsibility for their associates' ethical practice (Scaled Agile, 2021). The Josephson Institute, a non-profit organization that develops and delivers services and materials to increase ethical commitment, has defined 12 ethical principles for business executives (Josephson Institute, 2010), including Honesty,

Integrity, Promise-Keeping & Trustworthiness, Loyalty, Fairness, Concern for Others, Respect for Others, Law Abiding, Commitment to Excellence, Leadership, Reputation & Morale, and Accountability. The fundamental principles may vary slightly, but they all aim for professionalism, objectivity, integrity, and creating trust as the core principles for ethical business.

However, cultural and religious aspects may also influence business ethics, and this could be an interesting separate study, which could include some potential examples:

- **Values and Norms:** Culture and religion often shape the values and norms of a society, which in turn influence business ethics. For example, cultures that prioritize collectivism and community well-being may emphasize ethical behavior that benefits the broader society, while individualistic cultures may prioritize personal gain.
- **Moral Foundations:** Different cultures and religions may emphasize different moral foundations, such as fairness, loyalty, authority, or purity. These foundations can shape ethical decision-making and perceptions of right and wrong in business contexts.
- **Trust and Relationships:** Culture and religion can impact the importance of trust and relationships in business interactions. In some cultures, building strong personal relationships and trust is crucial before engaging in business transactions, while in others, contractual agreements may be prioritized.
- **Ethical Standards and Practices:** Religions often provide specific ethical guidelines and principles that followers are expected to adhere to in all aspects of life, including business. These standards can influence behaviors such as honesty, integrity, fairness, and social responsibility.
- **Ethical Dilemmas:** Cultural and religious beliefs may introduce unique ethical dilemmas in business. For example, certain cultural practices or religious beliefs may conflict with prevailing ethical standards or legal regulations in a globalized business environment.

It is important to note that cultural and religious influences on business ethics can vary significantly across different regions, countries, and even within subcultures or denominations. Therefore, conducting specific research within the context of a particular culture or religion can provide deeper insights into their impact on business ethics.

For simplicity, though, the author will stick to the most popular understanding of ethical principles in general and not delve into specific cultural and religious aspects of business ethics.

2.2. IMPLEMENTATION OF ETHICS IN THE ORGANIZATIONAL CONTEXT

Many professions, especially licensed ones such as accountants, project managers, nurses, and teachers, require practitioners to apply the professional code of ethics in their daily decision-making processes and operations.

A compliance officer or department can be a powerful tool for ethics implementation in an organization from a legal perspective. Companies may also use general ethics principles to reflect their core values while creating their own code of ethics and/or a code of conduct at the company level. Although not required by law, large corporations typically have their own code of conduct/code of ethics to set a consistent standard of employee behavior throughout multiple departments that cross national and, in many cases, international boundaries (Small Business, 2018). A code of ethics accomplishes the following (Ethics Web, 2018):

- It defines acceptable behaviors
- It promotes high standards of practice
- It provides a self-evaluation benchmark
- It establishes a framework for professional responsibilities
- As a side effect, it promotes/enhances the brand.

Referring to the previous finding of the World Economic Forum survey on ethics in decision-making (World Economic Forum, 2020), it is clear that a well-implemented and functioning code of ethics might also enforce deliberation on ethical decision-making.

Corporate Social Responsibility (CSR) is a new emerging trend led famously by multinational companies and those ethically-branded for implementing the company's ethical values publicly and contributing to society. According to Investopedia, CSR is a business model in which companies make a concerted effort to operate in ways that enhance rather than degrade society and the environment. As an anticipated side effect, CSR helps both society and the brand image of companies. CSR programs are a great way to raise morale in the workplace (Investopedia, 2021). It is similar to the code of ethics, just a lot more complex process, so not easily achievable for smaller companies.

The author looked up the companies recognized as the most ethical in the technology field (Ethisphere Institute, 2023): Dell Technologies, Hewlett Packard Enterprise, LinkedIn, Microsoft, and Western Digital were labeled as the most ethical for at least three consecutive years in a row in 2020, 2021, and 2022, and all of them have implemented their own CSR programs (published on their websites).

To ensure that companies maintain compliance, there are regulating and enforcing bodies (usually depending on the industry) to intervene if unethical corporate behavior is observed and to impose legal consequences (i.e., International Financial Reporting Standards, Food and Drug Administration, etc.). However, some authors criticize international regulatory bodies for the lack of international governance and inefficiency (Snidal, 2010); the international regulators have become too heavy and bureaucratic and act mostly as guidance. On the other hand, some authors argue that ethical behavior should be exceptionally voluntary, stating that imposing a punitive response to non-compliance that arises despite ethical behavior would be counterproductive (Hodges, 2016). It means that compliance is mostly maintained by the companies voluntarily, with regulating bodies intervening for legal consequences only. But if there are no legal consequences for some unethical actions in the digital world, then non-compliant actions will not be interrupted.

One of the most effective watchdogs for non-compliant behavior of corporates could be public opinion. It does not have any legal power yet it has financial power – it impacts customers' choices. As mentioned previously in this paper, some giant multinationals have been accused of unethical behavior publicly, and their opponents used public opinion for

actions: public calls for boycotts of goods produced by Nestlé and Coca-Cola, and also a heavily sponsored international research institute on AI, run by the former Google employee, to research the breach of Google's algorithms (DAIR Institute, 2021). In an ideal world, there should be no reason for a company to behave unethically, especially considering the link between ethical image and investment attraction (Ethisphere Institute, 2023). Therefore, businesses generally aim to label themselves as ethical.

2.3. ETHICS IN PROJECTS

Digital transformation has emerged as a driving force in reshaping industries and organizations, presenting unique challenges and opportunities that necessitate effective project management strategies. In the context of digital transformation, project management plays a vital role in guiding and overseeing the implementation of technology-driven initiatives, ensuring successful outcomes and organizational adaptability in the rapidly evolving digital landscape through their projects.

As per J. Hermarij, due to the changing context, new opportunities and threats occur and require the organizations to review their strategy as a reaction to unexpected events. Such changes could be best addressed through new projects and programmes which aim to adapt to important developments in the surrounding context, enable the successful implementation of changes, and consequently realize the benefits. (Hermarij, 2016)

The Project Management Institute PMI suggests that ethics lead to trust, which leads to leadership, which in turn leads to project success (Project Management Institute PMI, 2016).

As put together by J. Bateh in Table 1, herewith is a summary of the major ethics trends and how they could be applicable in the discipline of project management:

Table 1. Ethics in Managing Projects (Bateh, 2023)

Framework	What Is It?	PM Relevancy	Example
Kantian Ethics	This framework focuses on duties, rules, and obligations	Project managers can adhere strictly to rules, standards, and guidelines	If the project is running behind the schedule, instead of cutting corners on quality checks (which would violate the set rules), the manager upholds the duty to maintain quality, and explores other solutions
Utilitarian Ethics	The most ethical choice is the one that will produce the greatest good for the greatest number	Project managers can weigh the potential outcomes of decisions to achieve the greatest overall benefit for all stakeholders	When facing the budget constraints, the manager decides to reduce perks in order to preserve the project's main objectives, considering this to cause the least harm and greatest overall benefit
Virtue Ethics	Emphasizes the role of one's character and the virtues that one's character embodies for evaluating ethical behavior	Project managers can promote traits like honesty, courage, fairness, and temperance	The project manager encourages honesty in status reports and team communication, promoting transparency even when the project news is unfavorable
Care Ethics	Focuses on the moral significance of close relationships and emotional empathy	Project managers can consider individual needs and emotions in decision-making and create a supportive, empathetic team culture	A team member is facing personal difficulties. The manager adjusts their workload and provides additional support, prioritizing care and empathy

Contractualism	Emphasizes mutual agreement and fairness	Project managers can ensure decisions and actions are agreed upon, fair, and beneficial for all team members and stakeholders	When defining the project scope, the manager ensures all stakeholders agree on the main objectives and deliverables to ensure fairness and mutual benefits
Deontological Ethics	The morality of an action should be based on whether that action itself is right or wrong under a set of rules	Project managers can develop a set of non-negotiable principles that guide their actions	Despite pressure from stakeholders to rush a project, the manager holds firm to the agreed-upon safety standards and protocols
Pragmatic Ethics	Morality should be applied in practical terms and that ethical value can be determined by studying the effects of actions	Project managers can ensure ethical values align with the reality of project execution	The project manager decides to postpone a task that would overwork the team, prioritizing their well-being over rigid schedule adherence
Consequentialism	The consequences of one's conduct are the ultimate basis for any judgment about the rightness or wrongness of that conduct	Project managers can make decisions by predicting possible outcomes and selecting the option that seems to have the best overall consequences	Seeing a potential risk of overspending, the project manager decides to change suppliers, knowing that this decision will ensure the project stays within budget

The ethical frameworks provide project managers with valuable guidance for making ethical decisions and fostering a positive ethical culture within project teams. By integrating principles from Kantian Ethics, Utilitarian Ethics, Virtue Ethics, Care Ethics, Contractualism, Deontological Ethics, Pragmatic Ethics, and Consequentialism, project managers could navigate complex ethical dilemmas, promote fairness, empathy, and mutual agreement, and strive for the greatest overall benefit for stakeholders.

In conclusion, incorporating ethical considerations into project management practices not only ensures responsible and accountable project execution but also contributes to long-term success and stakeholder satisfaction.

3. SURVEY ON ROLE OF ETHICS IN CORPORATE DIGITAL TRANSFORMATION

The author is conducting a quantitative survey to understand the broader audience's viewpoints on ethics in the digitalized economy, specifically:

- The relevance of ethics in the digital world
- The use of ethical principles in digital economics and the necessity of its regulation
- The importance of corporate ethical labelling

3.1. METHODS USED

An automated, anonymous survey was carried out on the Survey Monkey virtual tool from January 1 to 4, 2022. To avoid any possible conflict of interest, the author refrained from using her professional network for this task. Due to time constraints, the survey was launched among authorized respondents (Audience survey) from Survey Monkey USA. The so-called Audience survey is a paid research. It means that the participants have signed a specific contract with Survey Monkey for being interviewed and agree to the processing of survey results. Survey Monkey is responsible for anonymity and voluntary involvement in the research. It also uses bots and fraud detection and regularly checks their audience to ensure

the quality of their research panels. Survey Monkey ensures age balance, that the relevant age groups of 18-29, 30-44, 45-60, and those over 60 are represented proportionally (Lasaite, 2022).

The impressive amount of multiple-choice responses collected from **169 interviewees** provides a trustworthy insight and serves as the basis for profound analysis. The author acknowledges the survey **limitations** that emerged after its closing:

- The research panel only represents the USA; other continents of the world are missing.
- The survey was intended to collect the viewpoints of team leads and decision-makers on ethics. However, the question about the respondent's role in their company is missing (although assumptions could be made based on the interviewees' household income, which is included in the survey).
- The industry/economic field that the respondents are working in is missing. It would be interesting to compare the link between different industries, especially the most innovative and digitalized ones, and ethics.

The survey results can be accessed on Survey Monkey (see the link in Reference List (Lasaite, 2022)).

3.2. SURVEY RESULTS AND ANALYSIS

Ethics proved to be an actual topic with over 72% of the 169 interviewees encountering ethical principles in their daily lives (Question 3 in the Survey). Almost 64% of respondents are concerned about ethics in the increasingly digitalized world, especially in sensitive fields such as healthcare, public government, etc. (see Picture 1). Religion is also seen as a guide for ethical principles based on the comments provided.

The high prevalence of encountering ethical principles in daily life and the significant concern about ethics in the digitalized world could highlight the importance of ethics in project management. Project managers must prioritize ethical considerations, especially in sensitive fields such as healthcare and public government, to protect stakeholders' interests and deliver socially responsible outcomes. Recognizing and respecting diverse ethical perspectives, including religious values, promotes inclusivity and could consequently enhance project success.

Q1 Are you concerned over ethics in the increasingly digitalized world?

Answered: 169 Skipped: 0

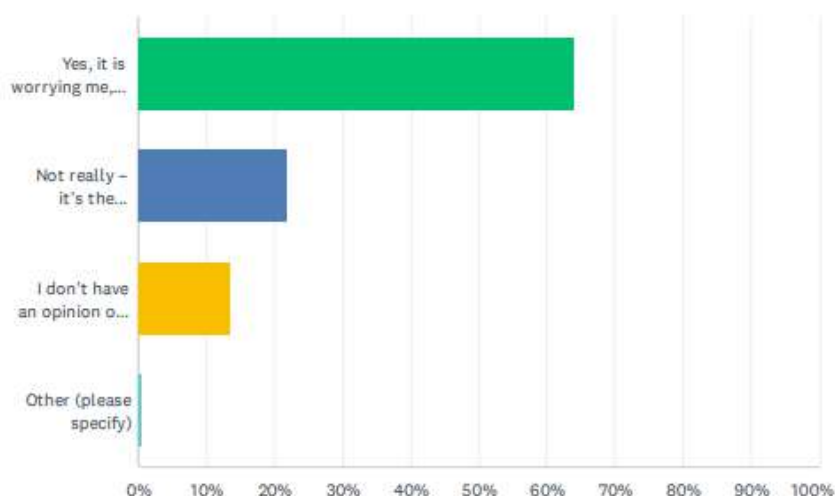


Figure 1. Q1: Are you concerned over ethics in the increasingly digitalized world?

Interestingly, a significant percentage of respondents (14%) did not have any opinion on ethics in the digital world. This might be related to the lack of ethics education in the curriculum, as almost 37% of respondents reported not having any classes or studies on ethics (see Picture 2). This indicates that, despite public concern about ethics, there is still room for increasing awareness and education in this area.

The inclusion of ethics in school curricula varies across different educational systems and countries. While some educational systems explicitly include ethics as a separate subject or integrate it into other subjects, others may not have a dedicated curriculum for teaching ethics. The presence and extent of ethics education depend on factors such as cultural values, educational policies, and local priorities.

It is worth noting that the emphasis on ethics education and the specific content covered can differ significantly between educational systems and even among schools within the same system. Therefore, the extent to which ethics is included in school curricula can vary widely worldwide.

In the discipline of project management, the lack of ethics education in school curricula could highlight the need for incorporating ethics training in project management education. Project managers should be equipped with a strong ethical foundation to navigate complex ethical dilemmas and make responsible decisions that consider the interests of stakeholders. By

emphasizing ethics in project management education, professionals could develop the necessary skills and awareness to uphold ethical principles throughout project lifecycles.

Q2 Have you ever studied ethics and if yes, then when?

Answered: 169 Skipped: 0

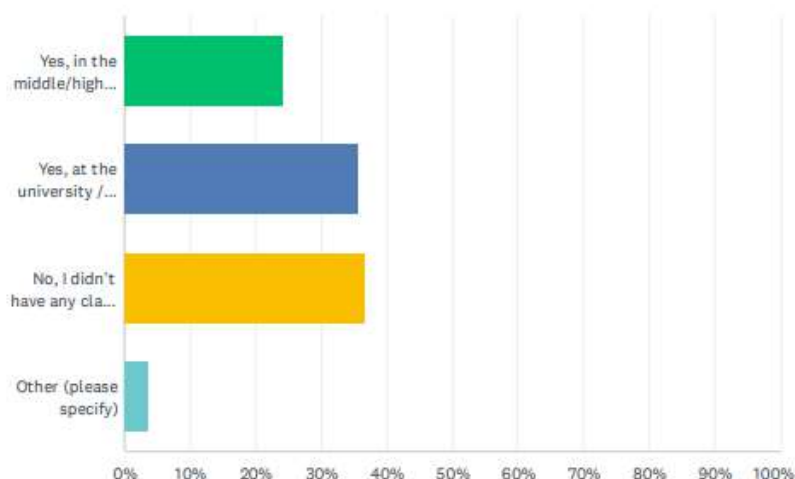


Figure 2. Q2: Have you ever studied ethics and if yes, then when?

The question about ethics classes in middle/high school and university received the most comments, with respondents indicating that they had taken ethics courses at work (4 out of 6 responses). Typically, school curriculums only include theoretical ethics, and not applied (professional) ethics. Nevertheless, it can provide a solid foundation for further understanding of ethical principles and their implementation in daily operations. The survey responses suggest that companies have recognized the importance of ethics and employee morale, and have therefore organized ethics courses in the workplace. This is also related to the previously mentioned mandatory codes of conduct for specific professions, as well as the popularity of corporate codes of ethics.

Surprisingly, when asked about the digital transformation in 2020-2021, only 25% of participants confirmed that their companies underwent a recent digital transformation, while 56% of participants reported no significant changes (see Picture 3). These results contradict those published by Deloitte, which reported that 85% of CEOs accelerated digital initiatives during the pandemic in 2020-2021 (Deloitte, 2021). The discrepancy may be explained by the relatively high percentage of interviewees aged over 60, which accounts for over 16%, as well as the high number of students in the age group of 18-29, representing 16% (neither students nor retired persons work, so they may not have observed any digital transformation in companies).

Q7 Did the company you are currently working at undergo any significant digital transformation in 2020-2021?

Answered: 169 Skipped: 0

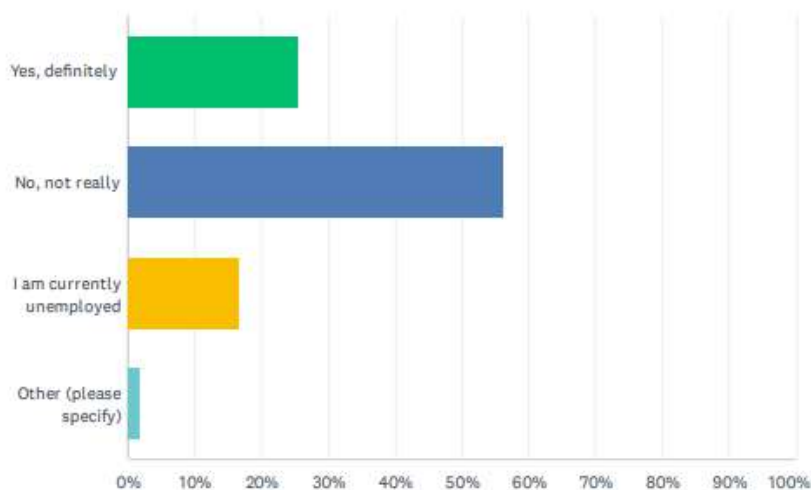


Figure 3. Q7: Did the company you are currently working at undergo any significant digital transformation in 2020-2021?

The majority of interviewees (65%) supported the idea that fundamental ethical principles should be consulted in digital transformation (Picture 4), but only 56% of them supported the idea of a regulatory system on the government level (Picture 5). Based on the survey results, ethical principles should definitely be encouraged, especially on the government level, but there is not much support for enforcement.

The governments could possibly encourage (not enforce) ethical principles at the governmental level through legislation and regulations, promoting the Code of Ethics and Conduct for public officials and employees, ethics training and education, collaboration with civil society and international organizations, transparency and accountability, etc. The specific approaches taken may vary depending on the country, its cultural context, religion – as previously mentioned, and also the prevailing ethical challenges faced.

What regarding the interpretation in the context of project management, the majority of interviewees expressing support for fundamental ethical principles in digital transformation aligns with the growing recognition of ethics as a crucial aspect of project management. Project managers could play a vital role in ensuring ethical considerations are integrated into project planning, execution, and decision-making processes. While there is less support for a regulatory system on the government level, project managers could take the initiative to adopt ethical frameworks, guidelines, and codes of conduct within their organizations to promote ethical practices. This underscores the importance of internal governance and self-regulation

in project management, where project managers and teams uphold ethical principles voluntarily. By fostering a culture of ethical awareness and accountability, project management can contribute to responsible and socially beneficial digital transformations.

Q4 In your view, should fundamental ethical principles be consulted in digital transformation?

Answered: 169 Skipped: 0

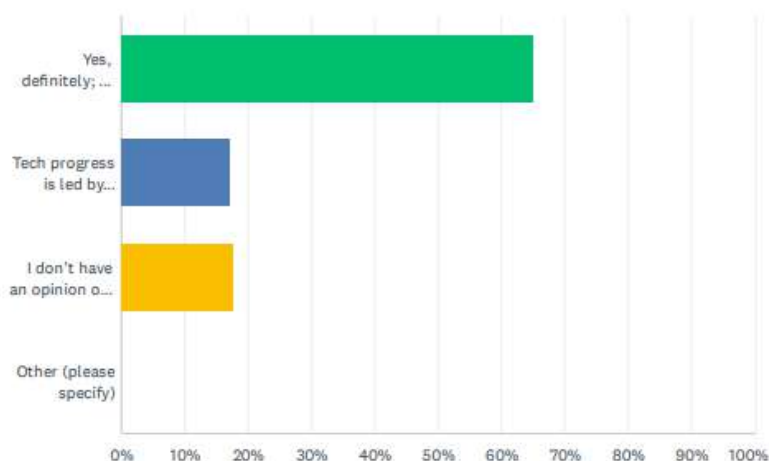


Figure 4. Q4: In your view, should fundamental ethical principles be consulted in digital transformation?

Interestingly, a high number of respondents didn't have an opinion on whether ethical principles should be consulted in digital transformation, outnumbering the "no" responses (Picture 4 and 5). This result may indicate a lack of awareness about ethics in the digital realm. It would be beneficial for governmental institutions to bring up this topic for public discussion and make clear the government's position on privacy and data protection, transparency and accountability, fairness and non-discrimination, trust and security, ethical AI and automation, as well as environmental sustainability.

In the context of project management, the lack of clear opinions on ethical principles in digital transformation suggests a need for increased awareness and education in project management regarding the ethical implications of digital initiatives. Project managers could take the initiative to foster discussions and establish ethical frameworks within their organizations, considering industry-specific ethical considerations and societal values. By proactively addressing these ethical concerns, project managers could ensure that digital transformation projects align with ethical standards and promote responsible and sustainable practices.

However, it's important to note that the specific ethical considerations may vary based on the industry, context, and societal values. Organizations should assess and address the ethical

implications of their digital transformation initiatives based on these principles and adapt them to their specific circumstances.

Q5 In your opinion, should companies' digital transformation be regulated to comply with fundamental ethical principles?

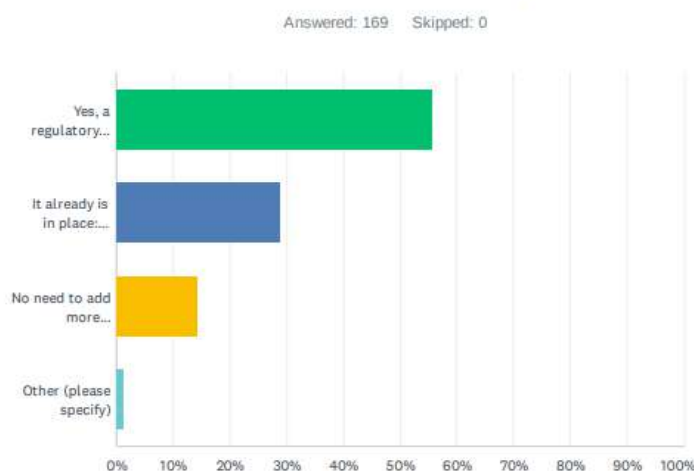


Figure 5. Q5: In your opinion, should companies' digital transformation be regulated to comply with fundamental ethical principles?

The author was personally pleased to see the responses to the following question: 56% of participants confirmed that ethical labeling of products/services providers would matter (Picture 6). As previously identified, an employer's ethical efforts (CSR, or at least a code of ethics) might also boost the morale of its employees. Additionally, there is a financial benefit to having an ethical image, as proven by the Ethisphere Institute mentioned earlier in this paper. Since ethical behavior and socially responsible actions are so well received by both employees and customers, is it time for corporations to shift to ethical economics and integrate ethical principles and values into business practices, decision-making, and the overall economic system? The new trends such as fair trade, CSR, socially responsible investing, circular economy, or benefit corporations could illustrate how ethical economics can encompass various initiatives and approaches that prioritize sustainability, social responsibility, and fairness in economic activities. By integrating ethical considerations into economic practices, ethical economics could create a more just, sustainable, and equitable economic system.

Q6 As a customer, would it matter to you if the company / products and services provider was labeled as ethical?

Answered: 169 Skipped: 0

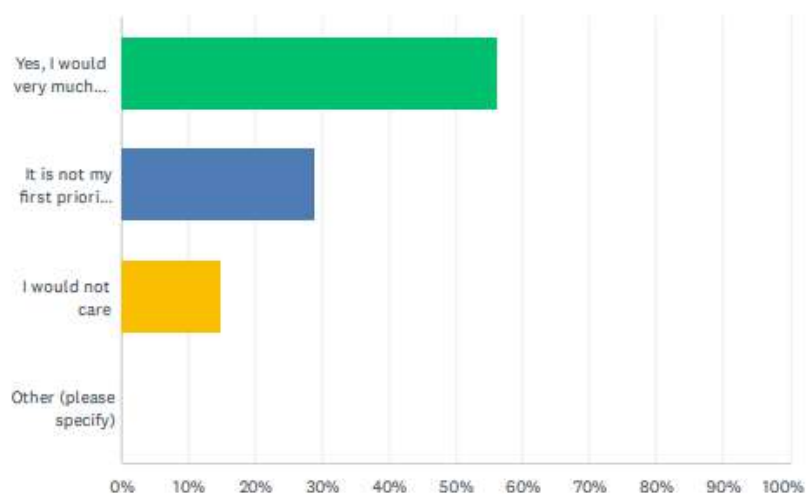


Figure 6. Q6: As a customer, would it matter to you if the company / products and services provider was labelled as ethical?

However, when analyzing Picture 6 further, it shows that almost 15% of the participants would not care about ethical labeling, and almost 29% would not consider it a priority. Increasing public awareness about ethical business practices could serve as a constant reminder to customers about what is considered unethical behavior by companies and how supporting such behavior by purchasing goods from such companies is detrimental. Linking unethical behavior with the products and services of a company could be made public to increase awareness and influence customer preferences.

In the context of project management, this suggests the importance of integrating ethical considerations and practices throughout the project lifecycle to ensure that products and services delivered align with ethical standards and meet the expectations of socially conscious customers.

However, there is an issue with regulatory bodies in this situation. As discussed previously, international regulatory bodies may act more as advisors than enforcement bodies due to a lack of international governance. Additionally, not all ethical breaches are officially against the law, so if no legal consequences can be applied, then there is no crime. A public opinion or coordinated campaign by government institutions could influence such situations, such as a boycott against Nestlé.

4. CONCLUSION

Overall, the survey results indicate that ethics plays a significant role in the digital transformation process, and there is a growing concern about ethical issues among the public. The analysis also shows that incorporating ethical considerations into project management practices could not only ensure responsible and accountable project execution but could consequently also contribute to long-term success and stakeholder satisfaction. By fostering a culture of ethical awareness and accountability, project management could contribute to responsible and socially beneficial digital transformations.

While most survey participants agreed that ethical principles should be consulted in the digital transformation, enforcement of these principles is not widely supported. This may indicate a need for increased awareness and education about ethics in the digital space. Companies seem to be aware of this issue and are providing ethics courses to their employees. However, there is also some divergence in opinion, with a notable percentage of participants believing that regulation and ethical labeling are not necessary or not a priority. As a response in the project management context, project managers could proactively raise awareness, promote ethical frameworks, and align digital transformation initiatives with ethical standards to ensure responsible and sustainable project outcomes.

However, the specific ethical considerations may vary based on the industry, context, and societal values. Organizations should assess and address the ethical implications of their digital transformation initiatives based on their principles and existing context and adapt them to their specific circumstances.

The low percentage of survey participants reporting a recent digital transformation in their companies suggests the need for further research on the topic, with a narrower focus on working-age participants. The impact of religion and culture on business ethics and digital transformation could also be further studied.

Limitations of the survey include its limited geographical scope and lack of information on respondents' roles in their companies' digital transformation processes. Future research should consider the industry/economic field to identify the relationship between different industries and the application of ethical frameworks in them. In conclusion, the topic of ethics in digital transformation is essential and warrants further attention and study.

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UPRAVLJANJE IZRADOM MULTIDISCIPLINARNOG GLAVNOG RUDARSKOG PROJEKTA POSTROJENJA ZA OPLEMENJIVANJE UGLJA NA POVRŠINSKOM KOPU GACKO

PROJECT MANAGEMENT OF THE DEVELOPMENT OF THE MULTIDISCIPLINARY MAIN MINING DESIGN OF THE COAL ENRICHMENT PLANT ON THE GACKO COAL MINE

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Apstrakt: Cilj rada jeste da pruži uvid u uspešnost vođenja multidisciplinarnog glavnog rudarskog projekta izrade tehničke dokumentacije u okviru virtuelnih timova u periodu pandemije COVID-19 i ograničene mobilnosti učesnika projekta. U radu je prikazana dugotrajnost, kompleksnost i multidisciplinarnost rudarskih projekata, koja su zahtevana znanja i iz kojih oblasti u samoj njihovoj realizaciji. Kroz OBS i WBS dijagrame prikazan je uvid u organizacionu strukturu glavnog rudarskog projekta za igradnju postrojenja za X-Ray senzorsko sortiranje uglja, a kroz vremenske planove prikazani su predviđeni i ostvareni rokovi.

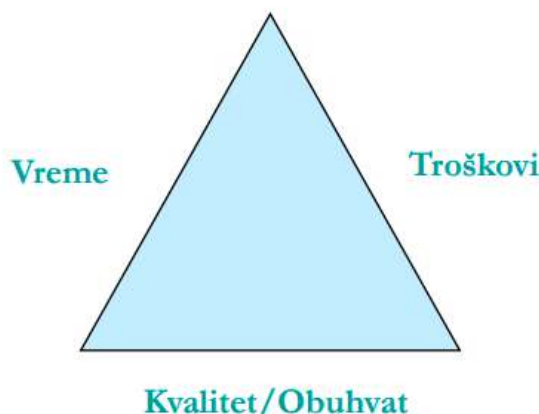
Ključne reči: Upravljanje projektom; Glavni rudarski projekat; X-Ray senzorsko sortiranje uglja.

Abstract: The goal of the paper is to provide insight into the success of leading a multidisciplinary main mining design of technical documentation production within virtual teams during the period of the COVID-19 pandemic and limited mobility of project participants. The paper shows the duration, complexity and multidisciplinary of mining projects, which knowledge is required and from which areas in their implementation itself. Through OBS and WBS diagrams, an insight into the organizational structure of the main mining project for the construction of facilities for X-Ray sensor sorting of coal is shown, and through time plans, the predicted and achieved deadlines are shown.

Key words: project management, main mining design, X-Ray sensor coal sorting

1. UVOD

Iz perspektive poslovanja, svaki projekat je vremenski ograničen poduhvat koji ima za cilj stvaranje jedinstvenog proizvoda ili usluge. Upravljanje projektom je koncept koji podrazumeva primenu stručnih znanja, umeća i tehnika u cilju realizacije određenog projekta u skladu sa ograničenjima u vidu vremenskih rokova, troškova i obima posla. Da bismo utvrdili da li smo postigli cilj projekta potrebne su nam dobre metode merenja. U literaturi koja se bavi problematikom upravljanja projektom, jedna od metoda merenja uspeha projekta prikazana je u vidu trougla trostrukog ograničenja na Slici 1:



Slika 1. Ilustracija trougla trostrukog ograničenja – vremena, obima i troškova

Karakteristika projekta je organizacija i hijerarhija. Organizational Breakdown Structure ili OBS je hijerarhijski model koji predstavlja uspostavljeni organizacioni okvir za planiranje projekta, upravljanje resursima, praćenje vremena i troškova, alokaciju troškova, izveštavanje o prihodima/profitu i upravljanje radom.

Osnova projekta su i aktivnosti. Work Breakdown Structure, odnosno WBS, obuhvata sve elemente projekta na organizovan način. Rastavljanje velikih, složenih projekata na manje delove projekta pruža bolji okvir za organizovanje i upravljanje tekućim i budućim projektima. WBS olakšava alokaciju resursa, dodeljivanje zadataka, merenje i kontrolu troškova projekta i fakturisanja. WBS se koristi na početku projekta za definisanje obima, identifikaciju centara troškova i predstavlja polaznu tačku za razvoj vremenskih planova projekta (Jovanović, 2015).

Savremeni projekti odlikuju se kompleksnošću i obimom posla, karakterišu ih veliki budžeti, uz prateću i neizvesnost i rizik. Što je obim i obuhvat projekta veći, to on zahteva veću mobilizaciju resursa i znanja iz raznih naučnih oblasti. Multidisciplinarnost podrazumeva da se projekat sastoji iz više disciplina koje su u određenoj meri komplementarne. Kompleksnost rudarskog projekta ogleda se u tome što se sastoji od velikog broja procesa, aktivnosti i zadataka koji se neretko rade paralelno, dok se multidisciplinarnost ogleda kroz uključivanje resursa iz raznih naučnih oblasti, pre svega iz oblasti rudarstva i geologije, ali i mnogobrojnih resursa iz oblasti inženjerskih nauka – mašinstva, elektrotehnike, građevine i arhitekture. Multidisciplinarnost u projektnom menadžmentu podrazumeva da svaki član tima analizira neki aspekt problema iz ugla svoje oblasti – kroz prizmu njenih znanja i metoda ali i da se usklađuje sa potrebama, normama i pravilima iz suprotnih oblasti.

Između ostalog, karakteristiku rudarskih projekata predstavlja i dugotrajnost u njihovoj realizaciji. Od definisanja projekta do njegovog zatvaranja realizacija može trajati godinama, ako ne i decenijama. Samim tim, u toku realizacije dolazi do promena okruženja u vidu napretka u tehnologiji, unapređenih alata, mašina, ali i do promene cene korisnih sastojaka rude i cene materijala, ljudskih resursa, energenata itd. Izvesne su i izmene standarda, propisa i zakona u periodu izrade projekta kao i njegove realizacije. Svi navedeni faktori imaju izuzetno važan uticaj na uspešnu realizaciju rudarskog projekta, odnosno na ravnotežu u trouglu troškova, kvaliteta i vremena realizacije.

Važna činjenica izrade glavnog rudarskog projekta za izgradnju postrojenja za X-Ray senzorsko sortiranje uglja je da je on u potpunosti vođen i izrađen od strane virtuelnog projektnog tima. Implementacija virtuelnih timova u poslovanju postaje sve češća pojava, pogotovo od 2020. godine usled pandemije COVID-19, koja je u poslovnom svetu dovela do ograničene mobilnosti pojedinaca i projektnih timova. U radu je prikazana organizacija na

realizaciji projekta kroz OBS i WBS dijagrame, kao i planiranje vremena i resursa i praćenje realizacije projekta.

2. OPIS PROJEKTA

Za uspešnu realizaciju upravljanja projektom za izgradnju Postrojenja za X-Ray senzorsko sortiranje uglja neophodno je bilo da projektni menadžer i virtuelni projektni tim raspolažu nizom znanja iz raznih nauka i disciplina. Pored specijalizovanih znanja iz oblasti rudarstva i geologije, ovaj projekat zahtevao je i specifična znanja poput:

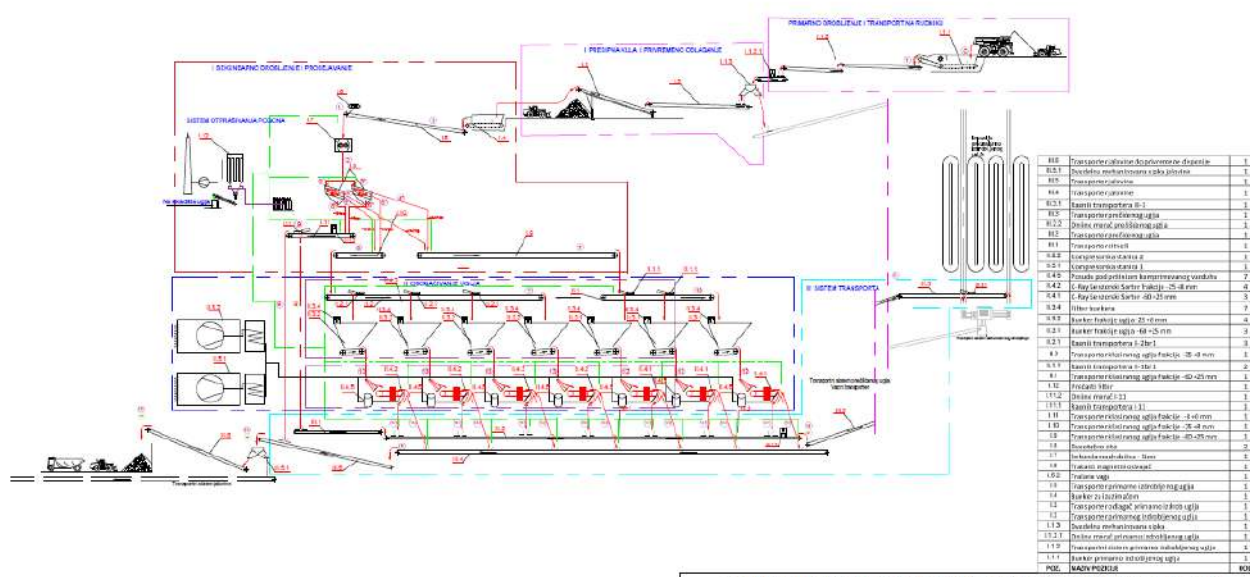
- Znanja iz oblasti inženjerskih nauka - građevine, arhitekture, elektrotehnike i mašinstva;
- Znanja iz ekonomije;
- Umeće u upravljanju operativnim procesima, logistici i komercijalnim poslovima;
- Znanja iz oblasti državne regulative, kao što su zakoni, propisi i standardi.

Projekat se sastojao u izradi kompletne investiciono-tehničke dokumentacije potrebne za izgradnju postrojenja za X-Ray senzorsko sortiranje – oplemenjivanje uglja. GRP, odnosno glavni rudarski projekat sa pripadajućim tehničkim projektima (koji se odnose na konceptijsko rešenje, građevinske objekte, sistem odvodnjavanja, elektro-mašinske instalacije, tehničku zaštitu i zaštitu životne sredine), rađen je u skladu sa Zakonom o rudarstvu i ostalom zakonskom regulativom Republike Srpske, iz čega proizilaze i nazivi tehničke dokumentacije.

Postrojenje za X-Ray senzorsko sortiranje uglja je složen tehnički sistem koji se sastoji od:

- Sistema transporta uglja do postrojenja;
- Sekundarnog drobljenja i prosejavanja;
- Sistema transporta raznih frakcija prosejanog uglja;
- Sistema X-Ray senzorskog sortiranja;
- Sistema transporta prečišćenog uglja;
- Sistema transporta odbačene jalovine.

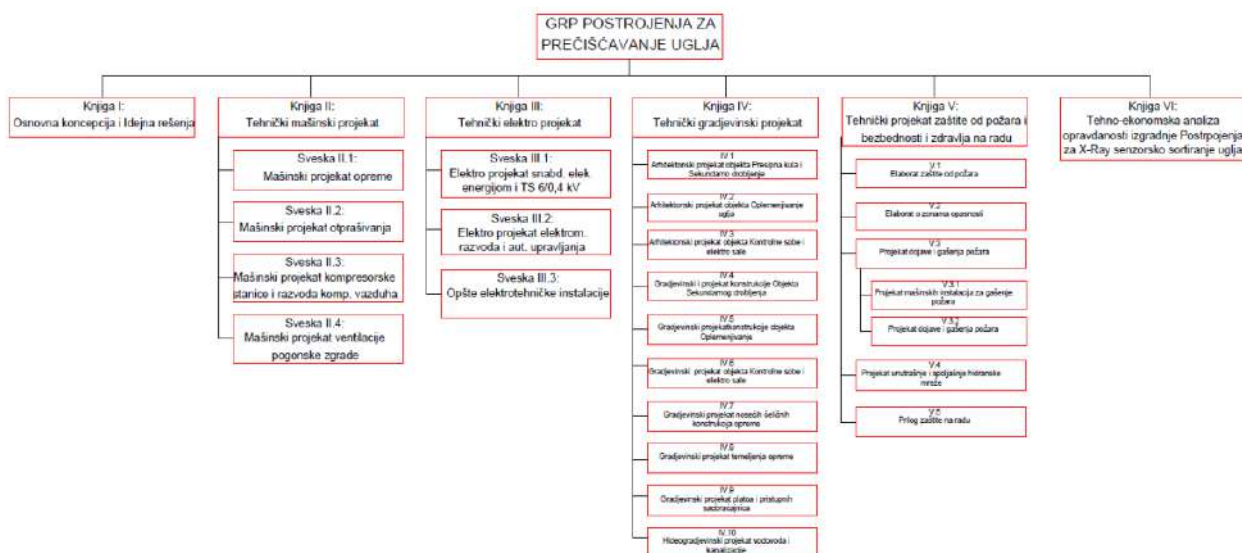
Tehnološka šema procesa je prikazana na Slici 2, dok je 3D prikaz Postrojenja prikazan na Slici 3.



Slika 2. Tehnološka šema procesa X-Ray senzorskog sortiranja uglja

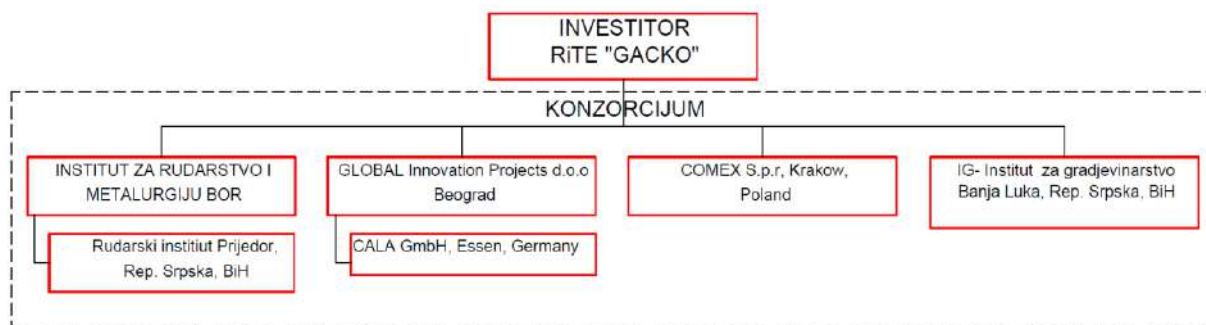
3. ORGANIZACIJA ZA REALIZACIJU GLAVNOG RUDARSKOG PROJEKTA

Obuhvat posla je prikazan kroz WBS dijagram projekta, kako je dato na Slici 4. Identifikovani su tehnički projekti koji su podeljeni po disciplinama u knjige – osnovna koncepcija i idejno rešenje, tehnički mašinski projekat, tehnički elektro projekat, tehnički građevinski projekat, tehnički projekat zaštite od požara i bezbednosti i sigurnosti na radu i tehno-ekonomska analiza opravdanosti izgradnje postrojenja za X-Ray senzorsko sortiranje uglja. Osim Knjiga I i VI, sve ostale knjiga sadržale su nekoliko svezaka.



Slika 4. Obuhvat projekta

Ogranizaciona šema za realizaciju projekta je prikazana kroz OBS dijagram, kao što je dato na Slici 5. Prikazan je investitor, kao i konzorcijum nekoliko firmi i instituta koji su se bavili upravljanjem i izradom kompletne investiciono-tehničke dokumentacije potrebne za izgradnju postrojenja za X-Ray senzorsko sortiranje – oplemenjivanje uglja.



Slika 5. Ogranizaciona šema – OBS za realizaciju posla

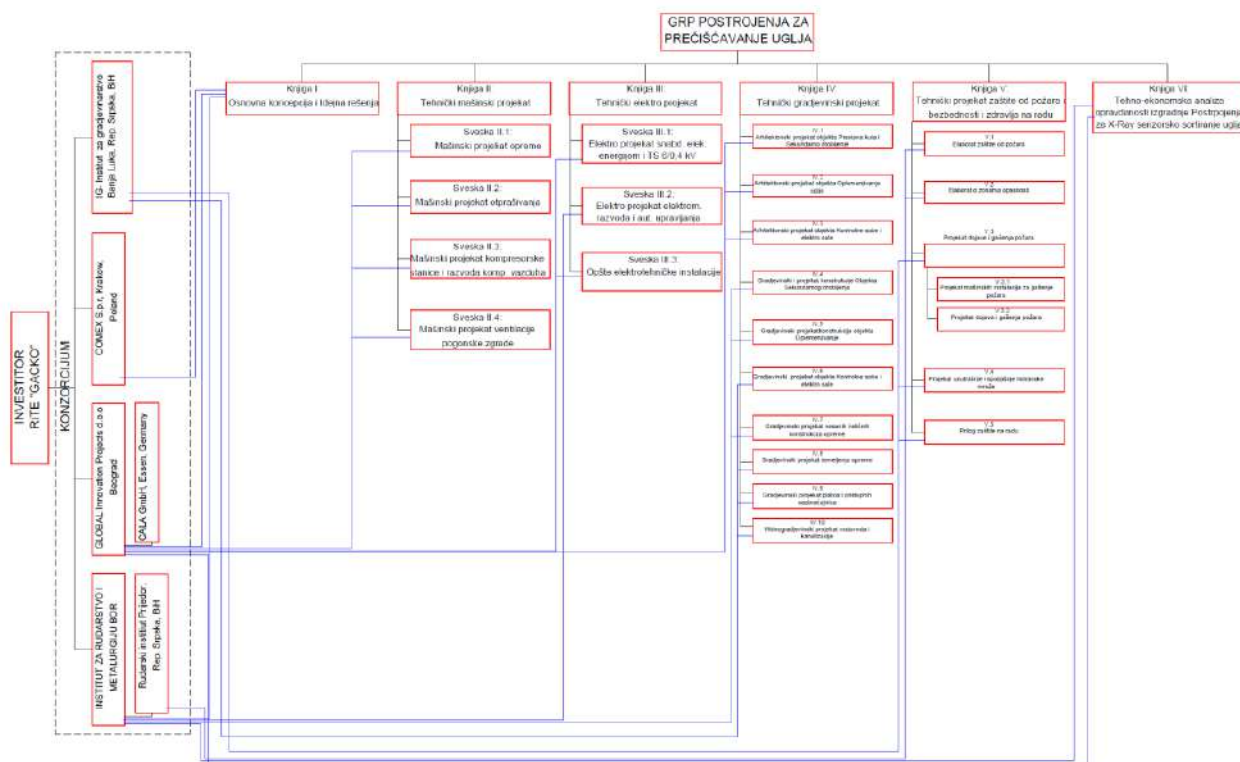
Virtuelni projektni tim su činili:

- Projektni menadžer,
- Odgovorni projektanti pojedinačnih projekata/knjiga,
- Saradnik za administraciju na projektu.

Članovi virtuelnog projektnog tima su bili iz 6 različitih kompanija koje su bile locirane u 4 različite države.

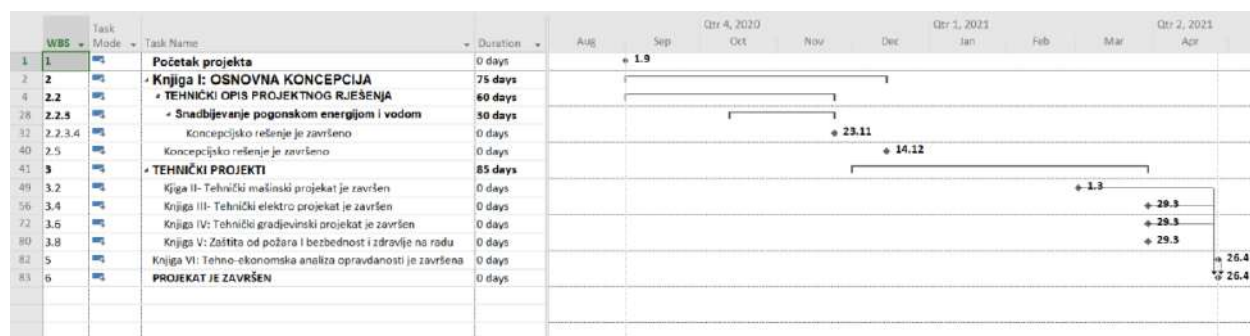
Ukrštanjem OBS i WBS dijagrama je dobijena matrica odgovornosti koja je takođe u saglasnosti sa podelom posla definisanoj u Ugovoru o konzorcijumu.

Matrica odgovornosti je prikazana na Slici 6.

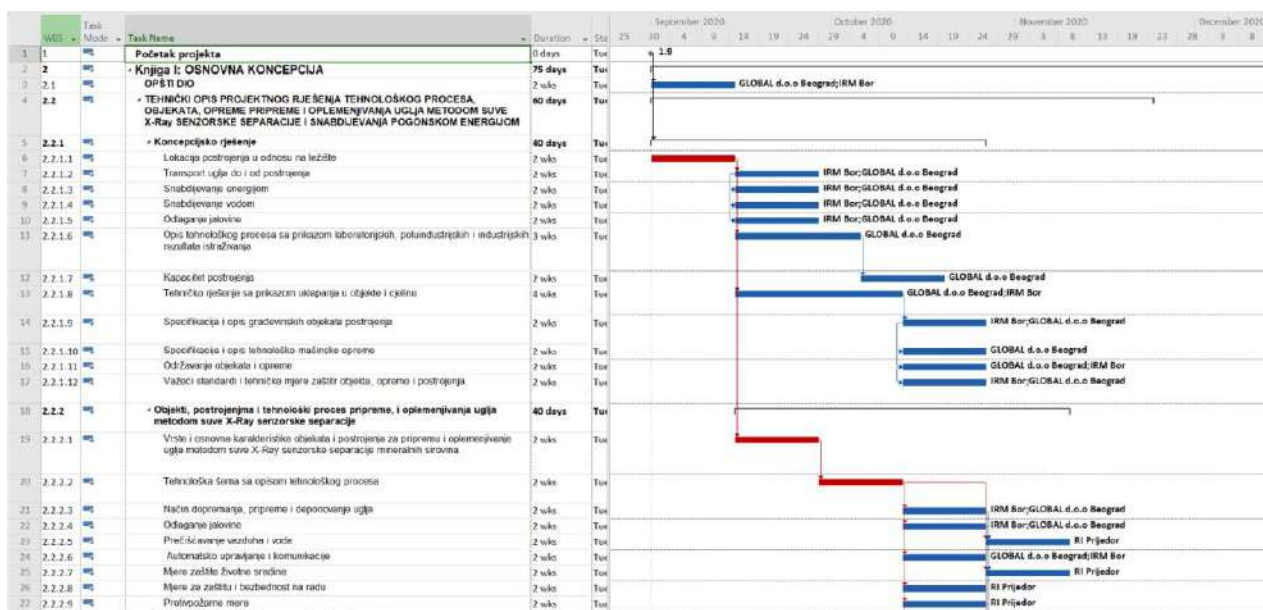


Slika 6. Matrica odgovornosti na realizaciji projekta

Planiranje vremena i resursa je izvršeno pomoću programa MsProject, do 3 nivoa WBS-a, odnosno do pojedinačnih dokumenata-svezaka. Vremenski plan sa prikazanim resursima je dosta obiman, pa je na Slici 7 prikazan vremenski plan zbirnih aktivnosti i ključnih događaja, dok je na Slici 8 prikazan vremenski plan početka realizacije projekta.



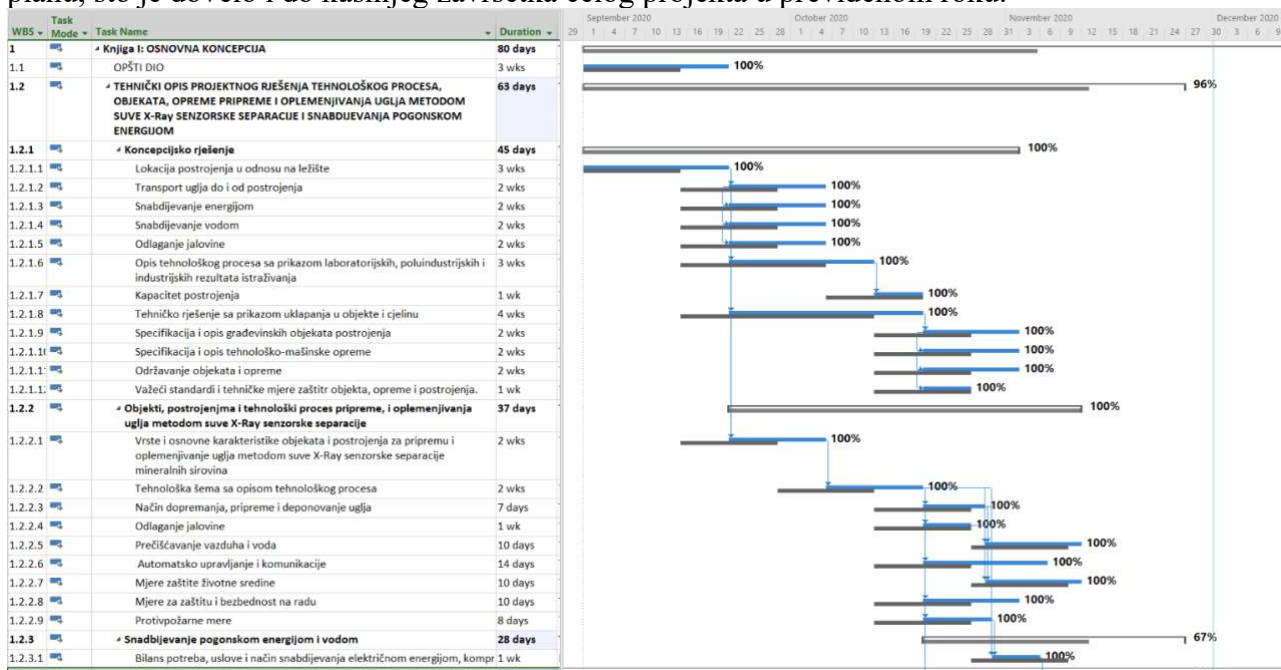
Slika 7. Vremenski plan zbirnih aktivnosti i ključnih događaja



Slika 8. Vremenski plan početka realizacije projekta

Trajanje projekta je bilo 8 meseci. Kontrola projektnih timova i progressa igrala je izuzetno važnu ulogu u upravljanju projekta. Evaluacija projekta od strane celog projektnog tima je vršena svakog meseca, na online sastanku celog projektnog tima.

Na Slici 9 je prikazan presek na realizaciji projekta posle 3 meseca od početka rada na njemu. Sa dijagrama praćenja se može videti da se uz manja odstupanja projekat realizovao prema planu, što je dovelo i do kasnijeg završetka celog projekta u predviđenom roku.



Slika 9. Evaluacija vremena realizacije projekta

4. ZAKLJUČAK

U radu su predstavljeni rezultati postignuti upravljanjem u izradi složenog multidisciplinarnog glavnog rudarskog projekta sa ciljem prikaza trenutnog stanja u radu jednog virtuelnog projektnog tima. U radu je pokazano da virtuelni projektni tim, u uslovima pandemije i ograničenog kretanja, može voditi i realizovati izradu složenog projekta izrade investiciono-tehničke dokumentacije.

Takođe, korišćenjem alata za planiranje vremena i resursa i kasnijim praćenjem realizacije projekta može se postići isporuka projekta u traženom i ugovorenom terminu.

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FINANSIRANJE SPORSTKIH DOGAĐAJA KROZ JAVNO-PRIVATNA PARTNERSTVA

FINANCING OF SPORTS EVENTS THROUGH PUBLIC-PRIVATE PARTNERSHIPS

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Apstrakt: Mešoviti model finansiranja je u Republici Srbiji u proteklim godinama bio najzastupljeniji kada je u pitanju organizacija velikih sportskih događaja i sporta opšte. Kako su budžetska novčana sredstva namenjena za finansiranje sporta veoma mala, organizacija velikih sportskih događaja nije moguća bez uzajamnog delovanja državnih institucija, organa lokalne zajednice i privatnih kompanija. Istovremenom upotrebom budžetskih sredstava i privatnih izvora stvara se sigurniji i dugoročno održivi model finansiranja. U radu su korišćene metoda analize sadržaja, komparativna metoda, deskriptivna i istorijska metoda. Predstavljena su dva modela finansiranja međunarodnih sportskih događaja i to: svetsko vojno prvenstva u krosu koje je održano 2013. godine u Apatinu i regionalno vojno prvenstvo u planinskom trčanju koje je održano 2021. godine na Kopaoniku. Potvrđena je teza da se organizovanje velikih međunarodnih sportskih događaja ne može kvalitetno sprovesti bez sudejstva državnih organa, lokalne zajednice i privatnih preduzeća.

Ključne reči: finansiranje, budžetska sredstva, sportski događaj.

Abstract: In recent years, the mixed financing model has been the most prevalent in the Republic of Serbia when it comes to the organization of major sports events and sports in general. Since the budget funds intended for financing sports are very small, the organization of major sports events is not possible without the mutual action of state institutions, local community authorities and private companies. By simultaneously using budget funds and private sources, a safer and long-term sustainable financing model is created. Content analysis method, comparative method, descriptive and historical method were used in the work. Two models of financing international sports events were presented, namely: the world military cross-country championship, which was held in 2013 in Apatin, and the regional military mountain running championship, which was held in 2021 on Kopaonik. The thesis that the organization of large international sports events cannot be carried out with quality without the cooperation of state authorities, local communities and private companies has been confirmed.

Keywords: Financing; Budget funds; Sporting event.

1. UVOD

Svojim kulturno-vaspitnim delovanjem sport i sportski događaji oplemenjuju nacije širom sveta. Sportski događaji mogu predstavljati vitalni izvor ptihoda za gradove, regione i zemlje domaćine i predstavljaju moćno oruđe za podsticanje privredne aktivnosti (Dimitrovski i dr., 2020). Međutim, organizatori ovih događaja ponekad nisu u mogućnosti da enormne troškove

organizacije pokriju potencijalnim prihodima. Prisećamo se Olimpijskih igara u Atini 2004. godine koje su stvorile rekordan gubitak i bile najava dužničke krize u Grčkoj.

Novčana sredstva neophodna za finansiranje vrhunskog, a posebno amaterskog sporta po pravilu obezbeđuje država, međutim, kada je u pitanju profesionalni sport, privatni kapital biva glavni izvor finansiranja, gde se kroz sponzorstva finansira najveći broj sportskih aktivnosti (Mićović, 2019). Kako države uglavnom ne izdvajaju dovoljna finansijska sredstva za sport i fizičku kulturu, ova tema sa ekonomskog aspekta postaje izuzetno značajna za svaku zemlju. Usled postavljanja sve većih bezbednosnih zahteva pred domaćina, gde se u prvi plan stavlja bezbednost učesnika, ali i posetilaca sportskog događaja, evidentno je da će se zemlje domaćini budućih sportskih događaja suočavati sa mnogo većim troškovima organizacije.

U radu je predstavljen primer finansiranja i organizacije dva velika sportska događaja čiji je organizator bilo Ministarstvo odbrane Republike Srbije. Ustanoviće se da je samo zajedničkim sadejstvom državnih ustanova, organa lokalnih zajednica i privatnih preduzeća, moguće kvalitetno organizovati velike sportske događaje.

Težišno su u ovom radu korišćene metode analize sadržaja i komparativna metoda, kao i istorijska i deskriptivna metoda.

2. MESTO RASHODA ZA SPORT I FIZIČKU KULTURU U STRUKTURI RASHODA REPUBLIKE SRBIJE

Budžetski okvir obezbeđuje Vlada, odnosno Ministarstvo finansija uz određene smernice u vezi sa budžetskim rashodima (Mihic & Obradovic, 2012). Zadovoljavanje određenih javnih potreba i obezbeđivanje novčanih sredstava za finansiranje tih potreba, predstavlja finansijsku delatnost svake države. Zdravstvena zaštita, odbrana, unutrašnja bezbednost, obrazovanje, kultura, socijalna zaštita, sport i fizička kultura, kao i druge društvene potrebe, uslovljene su postojanjem onih državnih institucija i organa koje se bave određenim resorom. Potrebe, koje se mogu realizovati samo uz delovanje posebnih institucija, organa i organizacija koje su pod okriljem države, jednim imenom nazivamo javnim potrebama (Radičić & Raičević, 2008).

Sve državne delatnosti i javne funkcije mogu se svrstati se u više grupa, a u ovom radu posebnu pažnju ćemo posvetiti grupi društvenih funkcija koje se bave pitanjima sporta i fizičke kulture. Finansiranje fizičke kulture i sporta uslovljeno je veličinom BDP-a, kao proizvodom ukupne društveno-ekonomske aktivnosti (Kostić i dr., 2018).

Tabela 1. Veličina javnih rashoda u Republici Srbiji u odnosu na obobreni budžet, u procentima (Izvor: Ministarstvo finansija Republike Srbije, datum pristupa 13.05.2023. godine)

Naziv rashoda	Izvršenje			Procena	Projekcija
	2019.	2020.	2021.	2022.	2023.
Ukupni rashodi	48,4	49,0	47,4	45,0	42,7
Opšte javne usluge	20,72	20,76	20,82	22,31	25,30
Odbrana	7,48	7,12	6,77	7,93	7,63
Unutrašnja bezbednost	11,10	10,73	10,33	9,52	8,68

Ekonomski poslovi	14,83	16,11	19,28	22,56	22,13
Zdravstvo	1,80	3,20	2,41	2,28	1,71
Kultura, vera sport i rekreacija	1,61	1,42	1,31	1,25	0,95
Obrazovanje	15,06	14,54	14,19	13,31	11,86
Socijalna sigurnost	26,37	25,14	23,92	19,58	20,55
Ostalo	1,01	0,98	0,97	0,46	1,18

U Tabeli 1. dat je prikaz rashoda predviđenih za sport i rekreaciju koji su u posmatranom periodu participirali u opsegu od samo 0,95% do 1,61% u ukupnim budžetskim sredstvima Republike Srbije. Pored navedenog i organi lokalne samouprave izdvajaju skroman iznos novčanih sredstava za finansiranje lokalnih sportskih udruženja, što sve skupa iznosi jedva do 2% budžetskih sredstava.

U periodu od 2019. do 2023. godine sredstva iz budžeta koja su namenjena Ministarstvu omladine i sporta iznosila su:

- u 2019. godini na razdelu 31 u iznosu od 5.920.909.000 dinara,
- u 2020. godini u iznosu od 6.117.664.000 dinara,
- u 2021. godini u iznosu od 11.153.219.000 dinara,
- u 2022. godini u iznosu od 6.628.999.000 dinara i
- u 2023. godini u iznosu od 4.930.562.000 dinara.

Nešto niži nivo odobrenih sredstava u 2023. godini je iz razloga što je tokom 2022. godine Ministarstvo omladine i sporta preraslo u Ministarstvo sporta, a resor „omladine“ prelazi u Ministarstvo turizma.

3. FINANSIJSKI ASPEKTI VELIKIH SPORTSKIH DOGAĐAJA

Sportska industrija pripada jednoj od najrazvijenijih grana industrija čija se vrednost svake godine uvećava, a osnovni krivac za njen ubrzani rast su mediji koji, kroz reklamu proizvoda najvećih svetskih brendova, utiču na rast i razvoj kompanija i rast finansijskog profita (Radošević i dr., 2016).

Veliki sportski događaj može se definisati kao događaj koji će izvršiti uticaj na čitav ekonomski sektor države domaćina, kroz stvaranje ogromnih troškova organizacije, ali i velikih prihoda po realizaciji događaja. U poslednje vreme sportski događaji su predstavljeni kao strateški alati koji dovode do višeg nivoa privredne aktivnosti, povećane zaposlenosti i povećanja broja turista (Almeida, 2019). Empirijski podaci sa 13 Olimpijskih igara održanih u periodu od 1972. do 2006. godine pokazuju da je javni sektor pokrivaio najmanje 50% svih troškova za 8 od ovih 13 Olimpijskih igara (Lechner & Solberg, 2021).

Uzimajući u obzir period od početka dvadesetog veka pa do danas, kada je finansiranje ovih događaja u pitanju, u literaturi se najčešće pominju ova tri oblika:

- 1) finansiranje državnim sredstvima,
- 2) iz privatnih izvora i
- 3) kombinacijom prva dva modela finansiranja.

Finansiranje velikih sportskih događaja putem društvenog kapitala sprovodilo se do 80-ih godina dvadesetog veka gde je sama organizacija događaja korišćena za promociju državnog uređenja. Počev od 1984. godine i letnjih Olimpijskih igara u Los Anđelesu, dominantan način finansiranja sportskih događaja je model finansiranja iz privatnih izvora (Vučinić,

2007). Upotrebom ovog modela finansiranja zadovoljavaju se interesi kako sportskog takmičenja, tako i poslovni interesi kompanije. Tom prilikom organizacija takmičenja se odvija finansijskih poteškoća, a kompanija kroz marketinšku delatnost uvećava svoj profit i poslovno bogatstvo.

Najčešći model finansiranja je mešoviti koji nastaje kombinacijom predhodna dva modela. Samo se istovremenom upotrebom budžetskih sredstava i sredstava iz privatnih izvora može stvoriti jedan siguran i na dugi rok održivi oblik finansiranja sportske delatnosti. U zapadnim zemljama se poslednjih godina udeo državnog finansiranja postepeno smanjuje i kreće se od 15 do 30 procenata, dok je u slabije razvijenim zemljama ovaj procenat viši i ide do čak 80 procenata.

3.1 FINANSIJSKA KONSTRUKCIJA SVETSKOG PRVENSTVA U KROSU

Po ugledu na organizatore velikih sportskih takmičenja, Ministarstvo odbrane Republike Srbije, pristupilo je organizaciji sportske manifestacije "55. svetsko vojno prvenstvo u krosu". Takmičenje je organizovano marta 2013. godine u Apatinu. Na takmičenju su učestvovali predstavnici 23 države sa oko 350 takmičara i članova delegacija. Problemi koji su pratili organizaciju takmičenja bili su jako kratak rok za realizaciju i organizaciju samog takmičenja, mali iznos opredeljenih novčanih sredstava iz budžeta, ogromna pomoć organa lokalne samouprave i drugi manji problemi.

Budžetska sredstva koja su planom finansiranja Ministarstva odbrane bila opredeljena za finansiranje ovog događaja iznosila su oko 1.500.000 dinara (smeštaj, ishrana, materijalni troškovi i drugo). Kada se uzmu u obzir kratak rok tj. vreme za koje je trebalo pripremiti i ogranozovati događaj i veličina samog događaja, novčana sredstva kojima je raspolagalo Ministarstvo odbrane nisu mogla da pokriju sve troškove realizacije ovog kompleksnog i složenog projekta (Neševski, 2014).

Deo nedostajućih novčana sredstva obezbeđen je od lokalnih organa vlasti grada Sombora, opštine Apatin i nekolicine privatnih kompanija čije su se donacije ogledale u finansijskim ali i materijalnim sredstvima. Samo takmičenje realizovano je na stadionu FK "Mladost" iz Apatina koji je korišćen na besplatnoj osnovi. Grad Sombor organizovao je obilazak kulturno-istorijskih znamenitosti grada i okoline (iznos donacije oko 250.000,00 dinara).

Svojim donacijama, sledeća pravna lica su pomogla u realizaciji i organizaciji manifestacije: Antidoping agencija Srbije (iznos donacije 350.000,00 dinara), Aerodrom Nikola Tesla (300.000,00 dinara), A.D. Jugorosgaz (100.000,00 dinara), D.O.O. Mocart (100.000,00 dinara). Materijalnu podršku pružila su sledeća pravna lica: Telekom Srbija (vrednost donacije oko 700.000,00 dinara), JP Srbijagas (oko 500.000,00 dinara), Atletski savez Srbije (oko 100.000,00 dinara), A.D. Planinka (50.000,00 dinara), A.D. Knjaz Miloš (oko 50.000,00 dinara) i drugi.

Ukupna materijalna i finansijska sredstva koja su donirana bila su u visini oko 3.000.000 dinara, što predstavlja preko 60% od ukupnih finansijskih sredstava utrošenih za realizaciju ovog projekta.

3.2 MODEL FINANSIRANJA REGIONALNOG PRVENSTVA U PLANINSKOM TRČANJU

Međunarodno takmičenje u planinskom trčanju „Chelenge cup“ održano je tokom avgusta 2021. godine na Kopaoniku. Na takmičenju su učestvovali predstavnici 7 država, sa preko 50 takmičara i članova delegacija.

Pored Ministarstva odbrane Republike Srbije, kao nosioca organizacije takmičenja, kao donatori se pojavljuju Opština Brus, Opština Raška, JP Skijališta Srbije, Grand hotel Kopaonik, Sportsko turistička organizacija Leposavić i drugi.

Kao i u slučaju organizacije Svetskoj vojnog prvenstva u krosu 2013. godine, opredeljena budžetska sredstva za realizaciju i organizaciju ovog takmičenja nisu bila dovoljna za pokriće troškova kompletnog projekta. Budžetska sredstva za finansiranje takmičenja bila su opredeljena u iznosu od 700.000 dinara (troškovi smeštaja i ishrane, materijalni troškovi i drugo). Materijalnu podršku organizaciji takmičenja pružili su: Opština Brus (vrednost oko 80.000,00 dinara), Opština Raška (oko 100.000,00 dinara), JP Skijališta Srbije (oko 50.000,00 dinara), Grand hotel Kopaonik (oko 50.000,00 dinara), Sportsko turistička organizacija Leposavić (oko 30.000,00 dinara) i drugi.

Potvrđena je ranija tvrdnja da je mešoviti model finansiranja najzastupljeniji model finansiranja sportskih događaja. Kombinacijom budžetskih sredstava i privatnih izvora stvara se jedan sigurniji i dugoročno održivi oblik finansiranja, što je potvrđeno i prilikom organizacije ova dva sportska događaja. Ovaj model finansiranja naročito dolazi do izražaja poslednjih godina u periodu kada država i državne institucije nisu u stanju da izdvoje dovoljna finansijska sredstva za organizaciju sportskih takmičenja i za sport uopšte.

4. ZAKLJUČAK

Kada je u pitanju organizacija i realizacija međunarodnih sportskih događaja, uviđamo da je siguran i kvalitetan model finansiranja praktično nemoguć bez zajedničkog ulaganja državnih institucija, organa lokalne zajednice i privatnih kompanija. Jedino se kombinacijom ova tri izvora finansiranja može uspostaviti jedan održivi oblik finansiranja.

U današnje vreme, mešoviti model finansiranja sporta i sportskih manifestacija postaje dominantan u Republici Srbiji. Svedoci smo da je sport poslednjih decenija jedina društvena aktivnost koja u kontinuitetu beleži pozitivne rezultate. Imajući u vidu navedeno, poražavajuće deluje činjenica da se od svih javnih potreba najmanji deo BDP-a izdvajao za sport i rekreaciju (ispod jednog procenta). Izmena ekonomske politike, gde bi se znatno više sredstava izdvajalo za potrebe sporta, pora da predstavlja imperativ za državne organe u narednom period.

Nakon detaljne analize organizacije ”55. svetskog vojnog prvenstva u krosu” i ”Cheleng kupau planinskom trčanju”, dolazi se do zaključka da bez ogromne saradnje državnog i privatnog sektora, realizacija i organizacija ovako velikih projekata nije moguća. Ministarstvo odbrane, kao nosilac organizacije ovih događaja, uz nesebičnu pomoć lokalne samouprave i privatnog sektora, uspešno je realizovalo ovako složeni zadatak.

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VOŽNJA PO TALASIMA KA ERU UPRAVLJANJA PROJEKTIMA SA ORIJENTACIJOM NA ČOVEKA

RIDE ON THE WAVES TOWARDS HUMAN-CENTRED PROJECT MANAGEMENT ERA

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Apstrakt: Članak ima za cilj da osnaži postojeći teorijski fond konceptom upravljanja projektima sa orijentacijom na čoveka, koristeći multidisciplinarni pristup kako bi se delotvorno uklopio u viziju održive budućnosti oblikovane za sve, stavljajući ljudske potrebe i vrednosti u srce univerzuma. Svrha studije je da osvetli viziju ere usmerene na čoveka koju su uobličile koncepti Društva 5.0 (Keidanren - Japan Business Federation, 2016) i Ekosistem Kolektivne (Hibridne) Inteligencije (Tornjanski et al., 2020b) sa jedne strane i da rasvetli eru upravljanja projektima usmerenu na čoveka, sa druge. Metodom istraživanja zasnovanoj na pregledu literature, rezultati istraživanja pokazuju iskre na talasima ka eri upravljanja projektima usmerenoj na čoveka proširenjem i produbljenjem postojećeg teorijskog fonda konstruktom vizije usmerene na čoveka pomoću komponenti Ekosistema Kolektivne (Hibridne) Inteligencije kako u koncept upravljanja projektima u čijem središtu je čovek, tako i u koncept društva u čijem središtu je čovek. Inovativno upravljanje projektima usredsređeno na čoveka je nov pristup upravljanju projektima koji je usmeren na stavljanje ljudi u srce životnog ciklusa projekta, prepoznajući značaj razumevanja i prihvatanja potreba i aspiracija ljudi. Stoga članak iznosi dragocene uvide kako za istraživače koji su zainteresovani za dalji razvoj upravljanja projektima sa orijentacijom na čoveka u teoriji, tako i preduzećima i preduzetnicima koji imaju nameru da razviju pristup upravljanja projektima sa orijentacijom na čoveka u praksi.

Ključne reči: upravljanje projektima usmereno na čoveka, Društvo 5.0, Ekosistem Kolektivne (Hibridne) Inteligencije, inovacije.

Abstract: The article aims at uplifting existing theoretical funds with the concept of human-centred project management, founded on artful multidisciplinary fashions to effectively fit the vision of a sustainable future modelled for all by putting humans' needs and values at the heart of the universe. The purpose of the study is to shed more light on the vision of a human-centred era shaped by Society 5.0 (Keidanren - Japan Business Federation, 2016) and Collective Intelligence (Hybrid) Ecosystem (Tornjanski et al., 2020b) concepts on the one hand, and to enlighten the human-centred project management era, on the other. Based on the literature review research method, research results show sparks of ride on the waves towards a human-centric project management era by extending and deepening existing theoretical funds with the construct of a human-centric vision by employing Collective Intelligence (Hybrid) Ecosystem components in both concepts, human-centric project management and human-centric society. Innovative human-centred project management is a new approach to project management that is focused on putting people at the heart of the project life cycle, recognizing the weight of understanding and embracing the needs and desires of humans.

Hence, the article put forward valuable insights to both researchers interested in further development of human-centred project management in theory and businesses and entrepreneurs looking to develop a more human-oriented project management approach in real-life practice.

Keywords: Human-centred project management, Society 5.0, Collective Intelligence (Hybrid) Ecosystem, innovations.

“Put humans at the heart of the universe and lead by healthy heart”
Vesna Tornjanski, Vuk Mirčetić, Stefan Milojević

1. INTRODUCTION

The previous century has drawn a well-established future characterized by numerous intensified changes in societies and economies, shaking long-stable business models and making the business environment more volatile, complex and fragmented. The wind of changes that emerged in various types and shapes fosters dynamism, and waviness of markets, and in synergy with accumulated challenges at a global scale, increases complexity, mental health issues, burnout and decreases project and change success rates at the same time. Recent trends in the macro environment, bolded by the COVID-19 pandemic, the Russia-Ukraine war and the beginning of the banking crisis, have created a foundation for scientists, academics and practitioners to illuminate a sustainable future for all to rethink traditional project management postulations and to profile future's sustainable project management discipline to effectively achieve desired short-term results and long-term outcomes in sustainable future vision outlined for all, by putting humans at the heart of the universe (Čudanov et al., 2019; Drucker, 1992; Edmonds, 2011; Hurn, 2012; Keidanren - Japan Business Federation, 2016; Leiter et al., 2014; Tornjanski et al., 2019; Tornjanski et al., 2020a; Tornjanski et al., 2020b; Tornjanski et al., 2020c; Tornjanski et al., 2021b; Tornjanski & Čudanov, 2021; Tornjanski et al., 2023; World Health Organization, 2001).

The article aims at brightening existing theoretical funds with the concept of the human-centred project management era, founded on artful multidisciplinary fashions to effectively fit the bright vision of a sustainable future designed for all by putting humans' needs and values at the heart of the universe and leading by a healthy heart. The purpose of the study is to shed more light on the vision of a human-centred era figured by Society 5.0 (Keidanren - Japan Business Federation, 2016) and Collective Intelligence (Hybrid) Ecosystem (Tornjanski et al., 2020b) concepts on the one hand, and to enlighten the human-centred project management era.

2. LITERATURE REVIEW

2.1. THE ART OF RIDING ON THE WAVES OF CHANGES

A kicking off of the exponential growth of information and communication technologies and the revolution of the German concept of “Industry 4.0” developed in 2011., have simultaneously closed the door to fixed and inflexible business models and opened the door to a business environment distinguished by the strength of doing business without boundaries. Industry 4.0 outlined an innovative frame founded on a composition of new

business and operating models aimed at boosting competitive advantage based on market development, new income generation and cost-efficient business. Contemporary society coloured by Industry 4.0 era brought many benefits and opportunities for organisations, economies and societies, yet notable challenges remain open even nowadays. Narrowly viewed, the main generators of costs and risks are acknowledged in weak security, privacy and resilience at governmental, organisational and individual levels, and disruptions of business continuity resulting in markable direct and indirect financial and non-financial losses out of which reputation is the most valued. Broadly considered, inadequate and unaligned public policies that effectively support healthy growth represent one of the most significant limitations to the healthy development of economies and societies at the country level. Fair public policies hint risk reduction exposure of employees to automation and assignment of suitable education to and training of all people in a long-life learning paradigm, aiming at growing competent employees ready to deal with the new technologies and innovations in the digital era. Next, a noteworthy issue refers to global income inequality that rises at high speed, which is required to be governed by public policies to avoid unfavourable effects on society. According to the Swiss bank UBS report shown in the studies of Park (2017) and Zervoudi (2020), the gap is less visible in developed economies such as Switzerland and Singapore, yet is of remarkable concern in developing and emerging economies, in particular in countries of Latin America and India. Income inequality may lead to “social cracks”, making greater sensitivity to future social and economic changes. Furthermore, poverty that is proliferating as well as the increased risk of a gender gap has been well-recognised as significant social issues needed to be standardised adequately (Corrales-Estrada et al., 2021; Marinkovic et al., 2016; Sia, 2021; Tornjanski et al., 2015a; Tornjanski & Cudanov, 2017; Tornjanski et al., 2021a; Zervoudi, 2020).

Introduced challenges in the text hereabove indicate improper and/or need for (project) management of the exponential growth of information and communication technologies and Industry 4.0. The thought is supported by many scholars (e.g. Brady et al., 2012; Brady & Davies, 2014; Morris, 2013; Samset & Volden, 2016) who point out that project management research mainly focuses on project challenges, failures and successes while holism is ignored in the research scope. Rising complexities in organisations and societies reflect on complexities of the contemporary interrelated systems, implying a consensus between researchers and practitioners on the justified need for new approaches to safety addressing the accompanying challenges (Leva et al., 2015). When human-centred project management is in question, Boy (2011) underlines that human-centred design is used in different areas and takes people into account from the beginning. In addition, Boy et al. (2016) point out that there are different ways of exchanging knowledge during the life cycle of a life-critical system related to people, such as expertise, plainness, information credibility, uncertainty, cognition, trust and consensus. However, taking into account shown challenges imposed by Industry 4.0 on the one hand and the lack of a holistic overview of human-centred project management on the other, there is a need for a call to scientists to rethink the future sustainability of humans, organisations, economies and societies, as well as the way of managing change and projects, by holistically analysing the phenomena (Săvoiu et al., 2023).

2.2. THE EMERGENCE OF THE VISION OF A HUMAN-CENTRED ERA

The emerging aspiration of a human-centric model has been recognised in the existing literature as a core concept of the very near future, representing a sparkling vision and long-term strategy of a “super smart society” sharpened by Keidanren – Japan Business Federation and adopted by the Government of Japan as a strategic national political initiative in 2016

(Keidanren - Japan Business Federation, 2016; Japan Government, 2020). According to Keidanren - Japan Business Federation (2016), Society 5.0 represents: "A human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space" (Keidanren - Japan Business Federation, 2016; Tornjanski et al., 2020b; Tornjanski & Čudanov, 2021, p. 415; Tornjanski et al., 2023, p. 65). Human-centric society defined by Society 5.0 is built upon Industry 4.0 with the primary objective to improve the quality of life and promote social responsibility and sustainability of all through a "super-smart society" (Ferreira & Serpa, 2018). In contrast to Industry 4.0, Society 5.0 weighs to shift all disadvantages from Industry 4.0 advantages to narrow the gap in the socio-economic system by putting humans at the heart of the vision of the future. Japan aims to implement a "vibrant economic society" with increased efficiency and extended possibilities to surpass new markets. Accordingly, Society 5.0 aims at playing a vital role in extending the innovative human-centric model scheduled for the world (Life, 2019; Shiroishi et al., 2018).

Another arising model, the "Collective Intelligence (Hybrid) Ecosystem", shaped for an effective and sustainable human-centric society, was conceptualised by a group of authors from Serbia in 2020. According to Tornjanski et al. (2020b), the model is illustrated as: "an innovative approach that encompasses and encourages simultaneous development and growth of both, economies and societies by introducing a concept of deep integration of humans' and smart machines' cognitive and emotional intelligence and open innovation, thus by empowering collective intelligence for the long-term well-being and prosperity of different stakeholder groups in the ecosystem" (Tornjanski et al., 2020b, p. 134; Tornjanski & Čudanov, 2021, p. 415; Tornjanski et al., 2023, p. 65). The Collective Intelligence (Hybrid) Ecosystem model exemplifies an innovative approach towards a human-centric vision founded on three vital components, i.e. cognitive and emotional intelligence of humans, the cognitive and emotional intelligence of smart machines and open innovation. The model emphasises the strengthening of humans' emotional and cognitive intelligence, the development of cognitive and emotional intelligence of smart machines up to the level that satisfies the needs of people and open innovation to sustain the continuous development of the model by incorporating the knowledge from an open ecosystem. Finally, the Collective Intelligence (Hybrid) Ecosystem implies deep integration of all components into holism to enhance the quality of life, quality of work, adequate work-health-private life balance, reduce risk at high-risk jobs, mental health issues, burnout and light up the knowledge-based economy for the healthy development of civilisations and healthy growth and well-being of people, organisations, ecosystems and societies. Deep integration in the sustainable future's concept illustrates at least three perspectives: safety based on the incorporation of strong security and privacy ecosystems in the Collective Intelligence (Hybrid) Ecosystem, deep integration of "cyber and real", "people and things" aiming at fashioning a healthy, noble and sustainable future for all in a new political-economic system that can effectively fit into the noble, wise, human-oriented and sustainable future competent to satisfies prosperity and well-being of all (Tornjanski et al., 2020b; Tornjanski & Čudanov, 2021; Tornjanski et al., 2021a; Tornjanski et al., 2023; Yang, 2018).

The transformative journey towards a human-centric society implies a long wave of changes and alignments in science, societies, economies, culture, values, institutions, the ways of perceiving the world, as well as the waves of shifts in managing changes and projects that should be human-centred oriented, too (Tornjanski et al., 2021b; Tornjanski & Čudanov, 2021; Tornjanski et al., 2023).

3. RESEARCH METHOD

The research study was developed based on a secondary data collection method. In modern research, running secondary data collection utilising a systematic literature review approach has become a vital tool for researchers, predominantly in challenging research subjects such as human-centred project management. By analysing existing theoretical funds, researchers can earn valuable insights into the latest trends, patterns, findings and practices in the area of research interest and be able to illuminate the topic and provide a new view of the same subject. This article opted for a systematic literature review approach, including a rigid and thorough process of identifying, selecting, and examining relevant studies and articles from diverse databases. The construct of the study is built on the collected data specified by reliability, validity, and unbiased, which allowed a better understanding of the challenges and opportunities regarding human-centred project management, identifying gaps in the current research, expanding existing knowledge and theories, and extending a sharper wisdom of the contemporary tendencies in the area of human-centricity.

4. RESEARCH RESULTS

4.1. RIDE ON THE WAVES TOWARDS HUMAN-CENTRED PROJECT MANAGEMENT ERA

The emergence of the vision of a sustainable future in the context of Society 5.0 and the Collective Intelligence (Hybrid) Ecosystem has also necessitated a rethinking of project management. Integrating digital technologies in all aspects of life and putting people in the heart of an ecosystem and society requires a new approach to project management that prioritizes human needs and values. Human-centred project management will be vital in deepening and implementing Society 5.0 and/or the Collective Intelligence (Hybrid) Ecosystem. Absorbing the human element in project management allows the creation of a more inclusive, sustainable and effective approach to project management that benefits everyone involved.

However, the existing theoretical fund needs more research that facilitates human-centred project management development. Table 1 summarises the literature review on the subject of human-centred project management considered holistically.

Table 1. Summary of literature review with reference to human-centred project management

The research subject	Key insights from the research	Source
Towards sustainability: Shaping the project management landscape in the context of the Society 5.0	- The research study strongly recommends further development of project management discipline, from traditional postulation to Society 5.0 project management, with the view of project management as a powerful contributor able to efficiently support and effectively lead the transformative journey towards a “super-smart society” or human-centred society; - The research study signifies the recognized integrations and required alignments at all levels, harmonized operational efficiency with strategic effectiveness in the transformative journey towards Society 5.0; - The research study provides a new project management landscape framework for the first time that relies heavily on the changes in project management concept, methodology, people,	Tornjanski et al. (2021b)

	technology and processes to satisfy the needs of the human-centric society concept. The new project management landscape framework is based on the recognized disadvantages, trends in the macro environment, and the vision of Society 5.0.	
Perspectives of project management sustainability in the Society 5.0 context: Moving forward towards human-centricity	• The research study extends and deepens the research of Tornjanski et al. (2021b) by suggesting the dimensions of sustainable project management on the prospects of a human-centric society viewed as a Society 5.0 and Collective Intelligence (Hybrid) Ecosystem, representing a foundation for effective response to all challenges the current project management discipline and societies are faced with; • The research study exemplifies a path towards human-centred society and human-centred project management by providing a detailed change description needed to be holistically understood and implemented in an integrated manner; • The research study points out that traditional project management is outdated and project management drawn for Industry 4.0 is poor enough to satisfy human-centred society needs and values; • The research study depicts a perfect equilibrium in the human-centred framework that satisfies human needs by effective integration of innovative technologies (smart machines) in all required phases of the project life-cycle, simple and resilient methodologies and processes, as well as empowered people with effective competencies to fit the vision of “super-smart society fruitfully”; • The research study suggests notable changes in and alignments with other equivalent and (inter)connected disciplines, creating values for theory, societies and economies.	Tornjanski et al. (2023)

By following the analogy of the theory of organisational lifecycles, developed by Adizes (2004), it can be concluded that the human-centric project management concept is at a very early stage of development according to the maturity level. Research results shown in the study forerun that the human-centred project management approach is a substantial divergence from conventional project management methods, which concentrate more on the technical aspects of a project than on the human factor. Although theoretical fund with reference to human-centred project management affords a holistic overview of the new project management paradigm concentrated on people, there is a lack of clear understanding of fitting the human-centred project management model into the human-centred society model(s).

With that in mind, Figure 1 illustrates the construct of a human-centric vision by utilising Collective Intelligence (Hybrid) Ecosystem components in both human-centric project management concept and human-centric society to extend and deepen understanding of human-centric project management. The construct shown in Figure 1 is grounded on a holistic approach of synergised elements, framed from a holistic viewpoint by eclecticism in the review of multiple disciplines and approaches (e.g. Chesbrough, 2003; Chesbrough et al., 2006; Chesbrough, 2020; Chung et al., 2016; Cvijanović et al., 2021; Delibašić et al., 2015;

Dwivedi et al, 2021; European Commission – EC, 2021; Fasnacht, 2009; Fasnacht, 2019; Fasnacht, 2021; Fredberg et al., 2008; Fukuyama, 2018; Goleman, 2001; Grunwitz, 2019; Jugdev et al., 2009; Manome et al., 2020; Keidanren - Japan Business Federation, 2016; Marinkovic et al., 2022; Mitsuyoshi et al., 2007; Obradovic et al., 2013; Oliver, 2020; Shimura et al, 2010; Toljaga-Nikolić et al., 2020; Toljaga-Nikolić et al., 2021; Tornjanski et al., 2015b; Tornjanski et al., 2015c; Tornjanski et al., 2016; Tornjanski & Milosavljević, 2016; Tornjanski et al., 2020b; Tornjanski et al., 2020c; Tornjanski & Čudanov, 2021; Tornjanski et al., 2021a; Tornjanski et al., 2021b; Tornjanski et al., 2023; Vukomanović et al., 2016).



• Incorporation of Open innovation for knowledge and information collection from an Open ecosystem using advanced integrated emerging technologies from Industry 4.0 (smart machines) to understand human needs and values, considering security, privacy, ethic and morality; • Utilization of advanced cognitive and emotional intelligence of smart machines to transform collected inputs into valuable information for decision-making in real-time and prioritizing human needs and values; • Critical thinking and creativity of humans in actions for decision-making as part of the Cognitive and emotional intelligence of humans.	• Integration of all project management dimensions defined for sustainable society according to Tornjanski et al. (2021b; 2023); • Alignment of public policies with human-centric needs to narrow the gap in the socio-economic system; • Alignment of operational efficiency with strategic effectiveness in the transformation journey according to the vision of a sustainable future; • Understanding the human needs and values of stakeholders in a project using integrated advanced technologies from Industry 4.0 (smart machines); • Alignment of human needs and values with the project outcome by incorporating a set of integrated smart machines' cognitive and emotional intelligence in all phases of the project life-cycle to satisfy humans' needs and achieve project success at the same time; • Empowerment of humans' emotional and cognitive intelligence in the project life-cycle to reduce mental health issues and burnout and to generate expected values;	• High quality of life; • High quality of work; • Achieved perfect equilibrium between work-health-private life balance; • Cultivated mental health without burnout; • Assured noble, safe and prosperous physical and virtual environments; • Reduced risks in high-risk jobs; • Enabled business continuity; • Empowered humans, economies and societies in a new socio-economic system; • Ensured further development, growth, prosperity and well-being of people, organizations, ecosystems and societies;
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	• Strengthening incorporation of open innovation paradigm during a transformative journey to collect new knowledge for further development of a knowledge-based economy; • Put humans' needs and values at the heart of the universe and lead by a healthy heart.	• Strengthened a healthy heart in the circle of Collective Intelligence (Hybrid) Ecosystem to widen the healthy evolution of civilizations.
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Figure 1. The construct of integrated Collective Intelligence (Hybrid) Ecosystem components in human-centric project management and human-centric society concepts

Riding the waves towards a new human-centred project management era also requires a shift in mindset and a commitment to collaborative working, taking into account that the world and humanity are exposed to various pervasive challenges that cannot be purposive and inscribed to flourishing outcomes by any government, institution, organization or group of individuals acting as a detached closed system or in a vacuum (Tornjanski & Čudanov, 2021; Tornjanski et al., 2023). Human-centred project management decors a new precedent for project management practices aiming for a sustainable future and focusing on people. By putting people at the centre of project planning, execution, and evaluation, society will have benefits and not just a privileged few. Therefore, human-centred project management is not just a buzzword but a crucial framework supporting building a more unbiased, sustainable, and inclusive future that encourages project wisdom beyond project delivery, ready to effectively transform society to a sustainable human-centred society designed for all.

5. CONCLUSION

The previous century has a well-established future coloured by various challenges and changes in societies and economies, shaking long-stable business models and making the business environment more volatile, complex and fragmented. The wind of changes accelerated the dynamism, and waviness of markets, which, jointly with accumulated challenges at a global scale and recent trends in the macro environment, increases complexity, mental health issues, burnout and decreases project and change success rates at the same time. Accordingly, sustainable future and sustainable project management have been recognised as key to achieving desired short-term results and long-term outcomes in the future vision outlined for all, by putting humans at the heart of the universe.

The aspiration of a human-centricity has been recognised in the existing literature as a core concept of the very near future, representing a sparkling vision and long-term strategy of a “super smart society” sharpened by Society 5.0 and drawn by the Collective Intelligence (Hybrid) Ecosystem model. The emergence of the vision of a human-centric future has also necessitated a rethinking of project management. Integrating digital technologies in all aspects of life and putting people in the heart of the universe requires a new approach to project management that prioritises human needs and values. Absorbing the human element in project management allows the creation of a more inclusive, sustainable and effective approach to project management that benefits everyone involved.

Based on the systematic literature review process, research results reveal a holistic view of studies interested in human-centred project management and illustrate the construct of a human-centric vision by utilising Collective Intelligence (Hybrid) Ecosystem elements in

both human-centric project management concept and human-centric society with the aim to extend and deepen understanding on human-centric project management concept.

Research results indicate that the human-centred project management approach is a considerable divergence from conventional project management methods, which concentrate more on the technical aspects of a project than on the human factor. Riding the waves towards a new human-centred project management era also requires a shift in mindset and a commitment to collaborative working, given that the world and humanity are exposed to numerous notable challenges that cannot be solved by any government, institution, organisation or group of individuals acting as a detached entity or in a vacuum (Tornjanski & Čudanov, 2021; Tornjanski et al., 2023). Human-centred project management decors a new precedent for project management practices aiming for a sustainable future and focusing on human beings. By putting people at the centre of project planning, execution, and evaluation, society will have benefits and not just a privileged few. Therefore, human-centred project management is not just a buzzword but a crucial framework supporting building a more unbiased, sustainable, and inclusive future that motivates project wisdom beyond project delivery.

The paper can provide valuable insights to both researchers interested in further extending and deepening human-centred project management in theory and businesses and entrepreneurs looking to develop a more human-oriented project management approach in practice.

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INTERDISCIPLINARNOST I ODRŽIVO UPRAVLJANJE PROJEKTIMA

INTERDISCIPLINARITY AND SUSTAINABLE PROJECT MANAGEMENT

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Apstrakt: U radu se prezentuju karakteristike uvođenja interdisciplinarnosti u održivo upravljanje projektima, kao i uticaj na razvoj kompetencija projektnog menadžera. Interdisciplinarnost se ovde tiče uspostavljanja interakcije i dijaloga među disciplinama, kako bi se rešili prepoznati problemi u organizaciji i društvu, što govori u prilog povezivanju koncepta interdisciplinarnosti i održivog upravljanja projektima. Imperativ danas jeste da se u upravljanju projektima podjednako vodi računa o ekonomskim, ekološkim i društvenim pitanjima, tako da kompetencije projektnog menadžera nisu vezane isključivo za vreme, budžet i kvalitet projekta, nego i oblasti poput etike, ljudskih prava i jednakosti, zdravlja, bezbednosti i zaštite na radu, “zelenih” tehnologija i mnoge druge.

Ključne reči: interdisciplinarnost, održivo upravljanje projektom, projektni menadžer, kompetencije

Abstract: The paper presents the characteristics of the integration of interdisciplinarity in sustainable project management as well as its impact on the development of project manager competencies. Interdisciplinarity concerns the establishment of interaction and dialogue between disciplines to solve recognized issues in the organization and society, which speaks in favour of connecting the concept of interdisciplinarity and sustainable project management. The imperative today is that economic, environmental, and social issues are equally considered when managing projects, so that the competences of the project manager are not only related to the time, budget, and quality of the project but also to topics such as ethics, human rights and equality, health and safety at work, “green” technologies, and many others.

Keywords: interdisciplinarity, sustainable project management, project manager, competencies

1. UVOD

„Specijalizacija je dostigla svoje granice. U disciplinama više nema voća koje se može dohvatiti - a mi želimo da jedemo voće. Zato moramo posaditi nova stabla. Interdisciplinarna stabla. I plodovi će se nalaziti nama na dohvat.” (Robert Erdmann, 2017)

Uvođenje interdisciplinarnosti u upravljanje projektima je dugotrajan proces koji se ne odvija spontano. Neophodno je aktivno uključivanje i vođenje svih interesnih strana koje obezbeđuju interdisciplinarnost, pažljivo planiranje i usmeravanje projekata od samog početka, kako bi se primenom interdisciplinarnih praksi, znanja i veština obezbedili uspešni projektni rezultati. Sa druge strane, interdisciplinarnost u upravljanju projektima donosi mogućnost učenja od drugih koji imaju različita iskustva, znanja i veštine, što unapređuje kompetencije projektnog menadžera u upravljanju projektima i doprinosi kreativnosti projektnog tima.

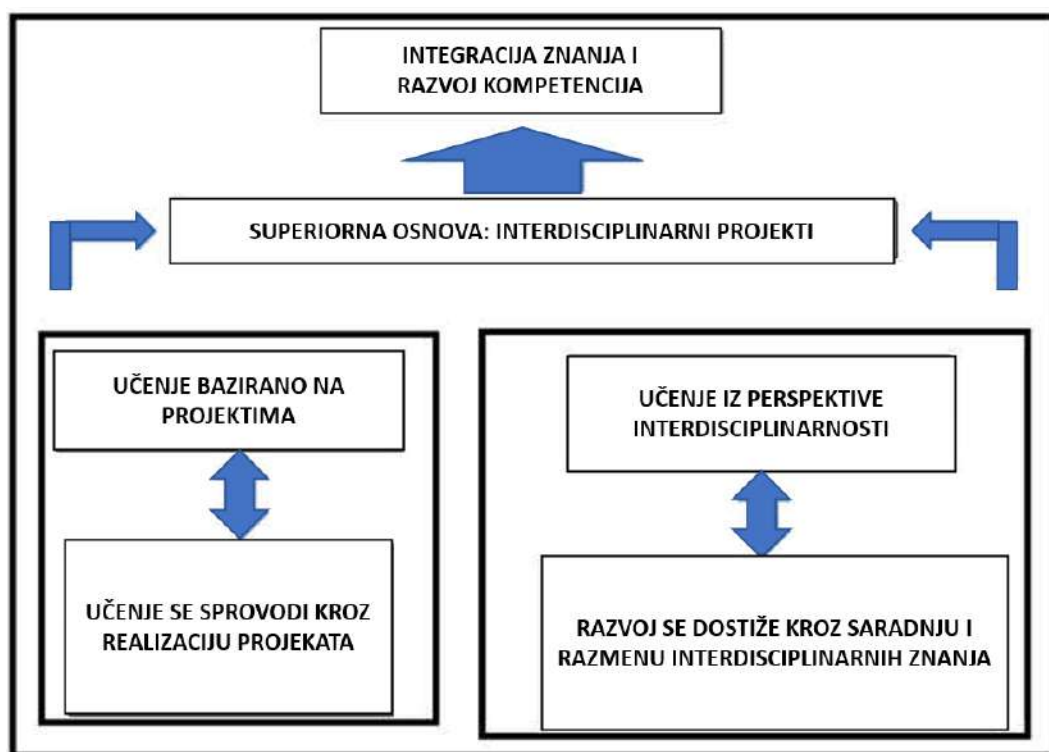
Kada je u pitanju održivo upravljanje projektima, može se reći da su projektnom menadžeru neophodna interdisciplinarna znanja i veštine, jer se posebna pažnja u upravljanju projektima na održiv način posvećuje etici, ljudskim pravima i jednakosti, zdravlju, bezbednosti i zaštiti na radu, te uslovima rada (Toljaga-Nikolić, 2023). Rezultati istraživanja ukazuju da humana, ljudska strana dobija sve veću važnost u upravljanju projektima (Tornjanski i dr., 2023; Nixon i dr., 2012; Slevin & Pinto, 2007), a stav da održivo upravljanje projektima doprinosi razvoju društva i zaštiti životne sredine (Szabo, 2016), upućuje kako nije dovoljno da projektni menadžer brine isključivo o dostizanju planiranog vremena, budžeta i kvaliteta u projektu.

Kompetenciju čine sposobnosti, stavovi, ponašanje, znanje, ličnost i veštine pojedinca (Cartwright & Yinger, 2007). Imajući u vidu da je u upravljanju projektima na održiv način neophodno da se projektni menadžer bavi svim dimenzijama održivosti (Obradović i dr., 2023), interdisciplinarnost je ključna karika koja omogućava dostizanje održivih rezultata projekta, ali pruža i prostor za učenje, lični rast i razvoj potencijala projektnog menadžera. Pored znanja projektnog menadžera koje je važno, ali ne i dovoljno, važno je i šta je sposoban da ostvari primenom svog znanja, kao i kako se ponaša dok sprovodi aktivnosti u projektu, što su svojevrzne dimenzije kompetencija (Cartwright & Yinger, 2007). Kada se ove dimenzije kompetencija dovedu u vezu sa održivim upravljanjem projektima, projektnom menadžeru su neophodna znanja vezana za održivost, održivi razvoj, ciljeve održivog razvoja, upravljanje projektima, prakse, alate i tehnike i ostale ključne elemente, ali se pored toga sagledavaju rezultati do koji se dolazi primenom znanja, dok se uporedo analizira i ponašanje, jer je prema principima održivosti (Goedknegt & Silvius, 2012) neophodna poštena, fer, korektna i transparentna komunikacija i ponašanje.

2. INTERDISCIPLINARNOST U FUNKCIJI UPRAVLJANJA PROJEKTIMA NA ODRŽIV NAČIN

Interdisciplinarnost po svojoj prirodi podrazumeva interakciju, dijalog među disciplinama i prožimanje njihovih znanja u cilju rešavanja određenih problema, što dovodi do veze između koncepta interdisciplinarnosti i upravljanja projektima, jer se projekti posmatraju kao mehanizmi za rešavanje prepoznatih problema i sprovođenje strateških promena. Intenzivne tehnološke promene, rast globalne konkurencije i globalna ekonomska kriza nametnuli su integraciju društvenih, ekoloških i ekonomskih pitanja u procese odlučivanja, dok je održivost prihvaćena kao ključ opstanka, rasta i razvoja organizacija (Silvius, 2017; Müller & Pflieger 2014). Svi učesnici u održivom upravljanju projektom kreiraju koristi za širu grupu interesnih strana, iskazujući time holistički pogled na koncept održivog razvoja u upravljanju projektima (Keeys & Huemann, 2017). Održivost je postala ključni faktor uspeha projekta (Daneshpour, 2015), a povezivanje koncepta održivog razvoja i upravljanja projektima predmet velikog interesovanja nauke i prakse (Sabini i dr, 2019; Schoper i dr, 2015).

Calvopiña i dr. (2017) su kroz istraživanje unapređenja procesa učenja baziranog na projektima iz perspektive interdisciplinarnosti ukazali na interdisciplinarnost kao put ka optimizaciji kompetencija i veština, što ukazuje na važnost uvođenja interdisciplinarnosti u upravljanje projektima i uticaj na kompetentnost projektnog menadžera. Integracijom interdisciplinarnih znanja i veština u upravljanju projektima dobija se superiorna osnova (slika 1), što neposredno utiče na kvalitet procesa i kvalitet rezultata procesa.



Slika 1. Povezivanje učenja baziranog na projektima i perspektive interdisciplinarnosti (adaptirano prema Calvopiña i dr, 2017)

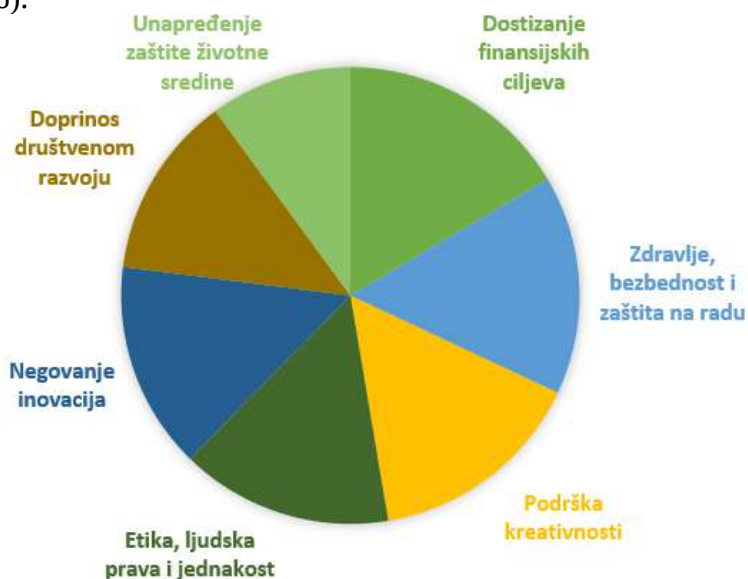
U kojoj meri održivo upravljanje projektima zahteva interdisciplinarnost znanja i veština projektnog menadžera ukazuju i zaključci Hwanga i Tana (2012), da je danas u upravljanju projektima značajna primena “zelenih” tehnologija, te navode brojne izazove za projektnog menadžera u pogledu njihove primene. Pored toga što postoji nerazumevanje i manjak interesa interesnih strana, kao i visoki troškovi primene ovih tehnologija (Hwang & Tan, 2012), neophodna je dobra informisanost i znanje projektnog menadžera o dostupnim “zelenim” rešenjima koja mogu da se uključe u projekat, i svest o prednostima koje se ostvaruju, kako za organizaciju, tako i za društvo (Agarwal & Kalmar, 2015). Da bi se integrisala interdisciplinarnost u upravljanje projektima, projektni menadžer treba da analizira discipline od značaja za upravljanje projektom, pronalazeći, analizirajući i sumirajući relevantne informacije po disciplinama. Zatim je potrebno nalaženje veza između disciplina i kombinovanje njihovih znanja u funkciji rešavanja problema, da bi se na kraju integracijom ostvarili novi uvidi i kreirali rezultati na način koji ne bi bio moguć na osnovu primene jedne discipline.

3. UTICAJ INTERDISCIPLINARNOSTI NA KOMPETENCIJE PROJEKTOG MENADŽERA

Kompetentan projektni menadžer i projektni tim su jedan od kritičnih faktora uspeha u projektu (APM, 2019), dok Banihashemi i dr. (2017) smatraju da su najuticajniji kritični faktor uspeha u održivom upravljanju projektom. Treba imati u vidu da je pojam održivosti u projektu povezan sa dugoročnom orijentacijom i samim tim većom neizvesnosti u odlučivanju, a da ujedno raste i broj interesnih strana sa kojima se aktivno komunicira u projektu, na osnovu čega se zaključuje da se projektni menadžer u održivom upravljanju projektima susreće sa mnogim izazovima. U radu je prethodno ukazano na važnost uvođenja

interdisciplinarnosti u upravljanje projektima zbog ključnog doprinosa sveobuhvatnom sagledavanju problema, ali i učenju i razvoju kompetencija projektnog menadžera.

Interdisciplinarnost u održivom upravljanju projektima znači primenu znanja i informacija različitih disciplina, kao i spremnost za učenje, rast i razvoj, tako da je fleksibilnost projektnog menadžera visoko vrednovana od strane autora (Cheng i dr., 2005; Maltzman, & Shirley, 2010). U literaturi se nalaze brojne kompetencije projektnog menadžera za održivo upravljanje projektima, kao što su: fleksibilnost, etičnost u radu, pošteno i odgovorno ponašanje, odgovornost, komunikacija, informisanost, analiza rizika i mnoge druge (Cheng i dr., 2005; Hwang & Tan, 2012; IPMA ICB4, 2015; Maltzman & Shirley, 2010; Nixon i dr, 2012; Szabo, 2016).



Slika 2. Oblasti od značaja za interdisciplinarno upravljanje projektima (Toljaga-Nikolić, 2022)

Szabo (2016) je naveo da je za projektnog menadžera podjednako značajno bavljenje ekonomskim, ekološkim i društvenim pitanjima, što otvara prostor za interdisciplinarni pristup upravljanju projektom. To potvrđuju rezultati istraživanja (Toljaga-Nikolić, 2022) prikazani na slici 2, gde se zaključuje da projektni menadžeri prepoznaju važnost i visoko vrednuju dostizanje finansijskih ciljeva; bavljenje etikom, ljudskim pravima i jednakosti; zdravljem, bezbednosti i zaštitom na radu; unapređenjem zaštite životne sredine; doprinosom društvenom razvoju; inovacijama i kreativnosti (Szabo, 2016).

4. ZAKLJUČAK

Intenzivne globalne promene su nametnule zahtev da procesi odlučivanja i upravljanja budu interdisciplinarni, budući da su problemi postali suviše složeni da bi se mogli rešavati primenom jedne discipline. Imajući u vidu da su projekti mehanizam za uvođenje promena i rešavanje problema, a da se kao imperativ današnjice javlja održivo poslovanje i upravljanje, neophodno je uvođenje interdisciplinarnosti u održivo upravljanje projektima. Sa jedne strane, to donosi značajne promene u dosadašnje rutine projektnog menadžera, dok sa druge strane nudi izuzetne mogućnosti za učenje i razvoj kompetencija kroz bavljenje različitim disciplinama u održivom upravljanju projektima.

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UPRAVLJANJE INTERDISCIPLINARNIM PROJEKTIMA I TIMOVIMA

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Abstract: It is an indisputable fact that it is innovation that is driving growth in industry and services. Technological change and the rise of a digital world in parallel has had a remarkable impact on the way enterprises manage themselves today. But what really creates innovation? The experience of industries and experts reveal that much depends on the team. Studies advocate that an interdisciplinary or cross-functional team is the right mix for innovation. The experience of industries and experts reveals that much depends on the team, and managing interdisciplinary teams is the key to achieve the goal of the project and to bring the innovation. An interdisciplinary project manager facilitates the knowledge across team members, establishing an environment for good problem-solving. Greater integration of disciplinary knowledge creates more effective critical thinking and innovative ideas. In this paper, some of basics of interdisciplinary techniques are presented in order to help in managing interdisciplinary projects and teams.

Keywords: Interdisciplinary projects, interdisciplinary teams, project management, sustainability, project manager skills, sustainable, 3G mobile network

Apstrakt: Neosporna je činjenica da upravo inovacije pokreću rast industrije i usluga. Tehnološke promene i uspon digitalnog sveta paralelno su imali izuzetan uticaj na način na koji preduzeća danas upravljaju svojim biznisom. Ali šta zaista stvara inovacije? Iskustvo industrije i stručnjaka otkrivaju da mnogo zavisi od tima. Studije zagovaraju da je interdisciplinarni ili međufunkcionalni tim prava mešavina za inovacije. Iskustvo industrije i stručnjaka otkriva da mnogo zavisi od tima, dok je upravljanje interdisciplinarnim timovima ključ za postizanje cilja projekta i ostavriavanja inovacija. Interdisciplinarni menadžer projekta olakšava protok znanja između članova tima, stvarajući okruženje za rešavanje problema. Veća integracija disciplinarnog znanja stvara efikasnije kritičko mišljenje i inovativne ideje. U ovom radu su predstavljene neke osnove interdisciplinarnih tehnika koje mogu pomoći u vođenju interdisciplinarnih projekata i timova.

Ključne reči: interdisciplinarni projekti, interdisciplinarni timovi, upravljanje projektima, održivost, veštine prodžekt menadžera, održivost, 3G mobilna mreža

1. INTRODUCTION

Iako se "interdisciplinarni" i "interdisciplinarnost" često posmatraju kao termini dvadesetog veka, taj koncept ima daleke istorijske korene, pre svega grčku filozofiju. Julie Thompson Klein svedoči da "koreni koncepta leže u brojnim idejama koje odjekuju kroz danas moderan diskurs — ideje ujedinjene nauke, opšteg znanja, sinteze i integracije znanja". Interdisciplinarni programi ponekad proističu iz zajedničkog ubeđenja da tradicionalne discipline nisu u stanju ili nisu dovoljne da samostalno, svaka za sebe ponaosob, objasne kompleksne pojave i reše složene probleme današnjice. Sa druge strane, interdisciplinarnost se posmatra i kao lek za štetne efekte prekomerne specijalizacije u svim disciplinama i izolacije u informacionom smislu. Nameće se da je samo interdisciplinarnost, u svom

najširem smislu, ta koja dovodi neophodnih iskoraka, tehnoloških i društvenih inovacija koje pokreću svet.

Preduzeća koja žele da budu pokretači na svetskom ili regionalnom nivou danas se moraju oslanjati na interdisciplinarnost svojih projekata i timova. Kada radite u interdisciplinarnim timovima, mogu se pojaviti mnogi izazovi kao što su: terminologija, kulturne razlike i neusklađena očekivanja (Boiko, MacKenzie, & Leung, 2015) članova tima. Štaviše, interdisciplinarni projekti kao što su npr. istraživanja zahtevaju značajno planiranje, upravljanje projektima i vreme za integraciju, uključujući angažovanje zainteresovanih strana. Štaviše, ključ za podršku informisanom i sposobnom interdisciplinarnom timu je osiguranje da se ciljevi i zadaci razvijaju u saradnji, istovremeno osiguravajući da pristup i proces budu transparentni i iterativni kako bi se podstakla prilagodljivost tima. (Lanier et al., 2018). Konačno, pokazalo se da je uključivanje interdisciplinarnosti u upravljanje vremenom i promovisanje interdisciplinarnog treninga ključno za prevazilaženje interdisciplinarnih izazova (Boiko, MacKenzie, & Leung, 2015). Stoga je važno da projektni menadžeri nauče neophodne veštine potrebne za vođenje i upravljanje interdisciplinarnim timovima, kao i da imaju znanje o varijablama koje su povezane sa njihovim upravljanjem.

Glavna razlika između interdisciplinarnih i multidisciplinarnih saradnji je u tome što interdisciplinarna istraživanja i projekti koriste alate i perspektive više disciplina, pri kojima multidisciplinarni ne pokušavaju da međusobno povežu i integrišu metode iz različitih disciplina.

Za ostatak rada, termin interdisciplinarna saradnja će se koristiti za opisivanje saradnje u kojima pojedinci iz različitih kultura, profesija, disciplina i pozadina rade zajedno, bez obzira na oblast rada čiji je projekat deo.

Interdisciplinarni menadžer projekta olakšava transfer znanja među članovima tima, stvarajući okruženje za jednostavno rešavanje problema. Veća integracija disciplinarnog znanja stvara efikasnije kritičko mišljenje i inovativne ideje. On organizuje, usmerava i usklađuje rad članova tima, rešava probleme i konflikte i daje direktive, sve u cilju efikasnog završetka projekta.

2. OSNOVE ZA UPRAVLJANJE INTERDISCIPLINARNIM PROJEKTNIM TIMOM

Zavisno od mesta u organizacionoj strukturi, projektni menadžer poseduje veća ili manja ovlašćenja u upravljanju projektom. U pogledu vođenja projektnog tima on poseduje formalna ovlašćenja za efikasno vođenje tima. Interdisciplinarni menadžer projekta olakšava transfer znanje među članovima tima i obezbeđuje neprekidni protok informacija kroz ceo tim.

Veća integracija disciplinarnog znanja stvara efikasnije kritičko mišljenje i inovativne ideje. Svaki član tima donosi svoje ideje i percepcije specifične za svoj domen. Dakle, menadžer projekta mora da identifikuje i upravlja različitim domenima znanja.

S obzirom na to da je većina učesnika u interdisciplinarnim projektima ranije bila obučena za tradicionalne discipline, u interdisciplinarnim timovima moraju da nauče da cene razlike u perspektivama i metodama drugih učesnika projekta. Interdisciplinarni program možda neće uspeti ako njegovi članovi ostanu 'zaglavljani' u svojim disciplinama (i u disciplinskim stavovima).

Trend u povećanju broja članova interdisciplinarnog projektnog tima dovodi do potrebe za efikasnim planiranjem angažovanja i opterećenja tima, odnosno do potrebe za korišćenjem specijalizovanih softvera, tako da u realnom vremenu postoji projekcija troškova i trajanja projekta. Ovo je moguće postići primenom **softvera za upravljanje projektima**, kao što su softveri MS Project ili Oracle Primavera P6.

Međutim, mnogo toga kada je u pitanju interdisciplinarni tim ostaje na samom menadžeru i izvan te ravni troškovi-vreme, a to je kako postići međusaradnju svih članova tima, kako iskoristiti potencijal pojedinaca na najbolji način, kako izbeći nepotrební utrošak vremena na međusobna individualna ubeđivanja i kompeticiju koja mogu usporiti projekt ili ga odvesti ka divergentnim pravcima od željenog. Autoritet ali i empatičnost menadžera, dakle personalne veštine, su od ključnog značaja u takvim situacijama.

Upravljanje resursima i planiranje kapaciteta nisu stvari koje je lako sprovesti. Menadžerima projekata često nedostaju alati za efikasno upravljanje opterećenjem među timovima i tu se često pribegava intuitivnim rešenjima.

2.1. TEHNIKE ZA UPRAVLJANJE INTERDISCIPLINARNIM TIMOM

- Upravljanje raznovrsnošću znanja

Interdisciplinarni tim je mešavina znanja. Mnoštvo je stručnjaka iz više različitih oblasti koji će sarađivati na projektu. Najveći izazov za menadžera projekta u vođenju takve jedinice je koordinacija nesmetanih kanala komunikacije između različitih članova. Svaki član donosi svoje ideje i percepcije specifične za svoj domen. Dakle, menadžer projekta mora da identifikuje i upravlja različitim domenima znanja. Dodatni korak bi trebalo da bude pažljivo zapažanje interakcija različitih stručnjaka na nivou domena kako bi se predvidele poteškoće sa kojima se mogu suočiti - u smislu iskustva, stručnosti, radne kulture itd. Prazninu u znanju treba popuniti redovnim seminarima i diskusijama, transferom znanja i informacija.

- Prvo napravite male ali važne korake – Upoznajte svoj tim

Prirodno je da su projektni menadžeri veoma uzbuđeni da započnu projekat, ali i da ga uspešno završe. Kada se radi sa timovima sa više funkcija, stres može biti kontraproduktivan. Prema istraživačima sa Harvarda, najbolje je prvo dozvoliti interdisciplinarnom timu da komunicira u „psihološki sigurnim okruženjima.“

“Članovi tima istinski donose svoju vrednost samo kada se psihički osećaju kao kod kuće”. Dakle, potrebno je doprineti izgradnji odnosa između pojedinačnih igrača tima. Drugi važan aspekt je izbegavanje praksi kao što je permanentni rad na daljinu ili od kuće, jer se eliminiše mogućnost upoznavanje između članova tima.

- Jezička barijera / Sintaksička granica i Protok informacija

Sintaksička granica je neizbežan izazov u svakom interfunkcionalnom timu: jezičke barijere, lingvistička ograničenja, podrazumevana zanačenja termina i skraćenica bez objašnjenja, pogrešna tumačenja – mogu da predstavljaju problem u komunikaciji članova tima. Može postati frustrirajuće ako ova sintaktička granica opstane. Iako se o tome retko govori, multinacionalne kompanije čiji članovi tima su rasuti svuda po svetu, se često sreću sa ovim problemom. Uvođenje jedinstvene terminologije i načina izveštavanja (pisanje mejlova, obraćanje, sadržaj) treba osmisliti kao zajednički način komunikacije i distribuirati ga kao pravilo među članovima tima kako bi se svi navikli na minimalnu formu jednoznačnosti.

Menadžer projekta ovde ima ključnu ulogu u sastavljanju, distribuciji i izgladivanju ovog uskog grla u višefunkcionalnom timu. Digitalna pismenost članova tima je od esencijalnog značaja i nužnost koja se podrazumeva.

Protok informacija mora biti neprekidan, bez zadržavanja (važnih) podataka između članova tima. Najbolja praksa je pokazala da ako svi članovi tima imaju sve informacije, najmanja je šansa da se neki od podataka izgubi ili neki korak preskoči. I ovde menadžer projekta mora da uputiti sve članove tima u metodologiju međusobne komunikacije jer hijerarhijsko izveštavanje najčešće gubi smisao na složenim interdisciplinarnim projektima.

- Sukobi (profesionalaca i menadžera) na projektu

Sporovi će biti način života i nisu loši za projektni tim. Menadžer projekta mora iskoristiti spor da poveća svoje razumevanje situacije i problema. Prema mišljenju stručnjaka, primarni uzroci sukoba u takvim grupama su profesionalne i menadžerske rasprave. Profesionalci traže autonomiju i stručnost, dok menadžeri teže formalnosti, autoritet i kontrolu. Menadžeru i samo svest o takvoj mogućnosti sukoba može pomoći da se preduprede potencijalni ili iskorene mnogi začeci budućih sukoba.

- Rizici

Upravljanje rizicima u svim fazama projekta pomaže menadžerima projekata da predvide probleme ili pretnje pre nego što se pojave i planiraju načine za ublažavanje posledica. Pored uobičajenih faktora rizika koji se analiziraju pre većine projekata, interdisciplinarni timovi nose i element koji je teško izmerljiv ali je neophodno računati na njega – npr. iako veliki broj kvalitetnih stručnjaka u svojim disciplinama delovanja znači izuzetan potencijal po sebi proje, može se lako pretvoriti u neoperativni skup individualaca koji svojom nekvalitetnom saradnjom vode do diskursa umesto ka cilju.

- Promene

Bilo da se radi o ublažavanju promena, njihovom smanjenju i/ili prihvatanju istih, pa i njihovom ubrzavanju, najpre menadžeri projekata moraju da se prilagode tim promenama, da prilagode svoje procese rada i moraju efikasno upravljati njima da bi završili projekte do kraja. Refleksija na interdisciplinarni tim će biti nužna ali početak promene uvek prvo treba da unese menadžer projekta i izrealzuje je kroz timski rad.

- Prilika

Najvažnija dobit od konstituisanja interdisciplinarnog tima je, pored realizacije samog projekta, mogućnost ličnog i profesionalnog razvoja članova tima kroz rad na ovakvom tipu projekta. Pametan menadžer projekta mora iskoristiti tim kako bi poboljšao sposobnost svoje radne snage kroz udruživanje. Na primer, zaposleni koji su na srednjem nivou stručnosti i obećavaju rast, umesto da se odvojeno troše sredstva i vreme na njihovu obuku, mogu se uključiti u višefunkcionalni tim, gde će oni moći da iskuse raznolikost znanja, izazove i okruženje za rešavanje problema kako bi razvili i unapredili svoje veštine. Time se postiže i veće zadovoljstvo pojedinca što za posledicu ima bolju radnu atmosferu i veću šansu projekta za uspeh.

3. PROBLEM ODRŽIVOSTI

Održivost znači sposobnost sistema bilo koje vrste da opstane u zdravom stanju tokom dužeg vremenskog perioda, odnosno, sposobnost organizacije da razvije strategiju rasta i razvoja koja funkcioniše na neodređeno vreme. Stoga, održivost projekta predstavlja opstajanje rezultata i postignutih ciljeva i nakon završetka projekta i odnosi se na trajni učinak koji će taj projekt proizvesti.

Odgovori u vezi održivosti projekta odgovaraju na sljedeća pitanja:

- Šta se događa **nakon što prestane finasiranje donatora?**
- **Jesu li rezultati vidljivi** duže vremena nakon projekta?

Održivost projekta sastoji se iz više aspekata:

1. **Finansijska održivost**
2. **Komercijalna održivost** projekta – Koja je strategija za izlazak na ciljano tržište? Na koji će se način prodati proizvod ili usluga ciljanom tržištu?
3. **Institucionalna održivost** – kako se novostvoreni procesi nastavljaju odvijati i okviru kojih institucija?
4. **Održivost u skladu sa pravnom regulativom i etičkim principima** – npr. poboljšano zakonodavstvo, usklađenost s postojećim pravnim okvirom ili više njih;
5. **Održivost u smislu zaštite okoline** – Kakav će učinak projekt imati na okolinu?

„Zeleno“ ili „održivo“ upravljanje projektima danas se smatra jednim od najvažnijih globalnih trendova upravljanja projektima (Gilbert Silvus, 2019).). Održivi razvoj, zbog različitih nivoa složenosti i široke mreže zainteresovanih strana, čini ga pogodnim da bude označen kao „opak“ problem (Prishlakivski J. & Searci C, 2013). Iako veća saradnja između disciplina – interdisciplinarna saradnja – može biti ključna za rešavanje ovakvih problema, okupljanje ljudi iz različitih disciplina može biti izazov, pošto različiti profesionalni i tehnički jezici dele različite paradigmatičke poglede na svet i poseduju različite veštine (Boiko, MacKenzie, & Leung, 2015).

Menadžeri projekata treba da razviju svoje menadžerske (kontekstualne) i bihevioralne veštine i znanja kako bi ispunili nove profesionalne zahteve (Obradović, Todorović, & Bushuiev, 2018). Da bi se pronašli odgovori na zaista složena pitanja, potrebno je više od jedne discipline ili profesije. Dakle, može se zaključiti da za održive projekte koji se sastoje od skupa ‘opakih’ problema treba formirati interdisciplinarne timove kako bi se maksimizirala mogućnost uspeha.

3.1. LITERATURA ZA INTERDISCIPLINARNE MENADŽERE

Šta se može pročitati u literaturi na temu interdisciplinarnosti i održivih projekata?

Pregled literature navodi koje su veštine potrebne menadžerima projekata za rad u interdisciplinarnim timovima, pored izazova i varijabli povezanih sa radom u takvim timovima. Ovaj pregled literature sastoji se i od istraživačkog i od deskriptivnog istraživačkog pristupa i za ovu studiju je pronađena korišćenjem visoko pouzdanih i kredibilnih baza podataka: Univerzitetska biblioteka u Malmeu, Research gate i Google Scholar.

Ključne reči koje su korišćene za pretraživanje časopisa bile su: Održivo upravljanje projektima ili upravljanje projektima, u kombinaciji sa interdisciplinarnim timovima i/ili veštinama ili varijablama ili izazovima. Korišćeni su samo recenzirani članci na engleskom iz 2011-2019.

Tabela 1. Pregled tema pronađenih u pregledu literature

Research	Year	Context	Aspects covered				
			IDP Variables	IDP Challenges	IDP Lessons	PM Skills	Sustainability
1- The interdisciplinary nature of the skills needed by project managers	2011	Literature review determining the skills needed by project managers that result in them being more successful	✗	✗	✗	✓	✗
2- Sustainability and Agility in Project Management Contradictory or Complementary?	2018	Analysis on the new perspectives within sustainability in project management	✗	✗	✗	✓	✓
3- Facilitating Integration in Interdisciplinary Research: Lessons from a South Florida Water, Sustainability, and Climate Project	2018	This article offers broad lessons for conducting interdisciplinary science from the South Florida Water, Sustainability and Climate Project (SFWSC)	✓	✓	✓	✗	✓
4 - Barriers and Solutions to Conducting Large International Interdisciplinary Research Projects	2017	Report on findings and results from a study of a large interdisciplinary, international National Science Foundation Partnership for International Research and education research project across the Americas	✓	✓	✓	✗	✗
5- Missing Miscommunication in Interdisciplinary Design Practice	2013	This article looks into the literature discourse of interdisciplinary communication	✗	✓	✓	✗	✗
6- Variables associated with interprofessional collaboration: The case of professionals working in Quebec local mental health service networks	2019	This study identified variables associated with interprofessional collaboration among 315 mental health professionals working in primary health care and specialized teams, within four local networks	✓	✓	✓	✗	✗
7- . In spite of our own best interests: Lessons from an interdisciplinary project on urban sustainability	2015	This paper presents the findings from a qualitative study of an interdisciplinary team working on an urban sustainability project	✓	✓	✓	✗	✓

Iz gornje tabele zaključuje se da većina studija u ovom pregledu literature se uglavnom sastoji od izazova i varijabli povezanih sa radom u interdisciplinarnim timovima. Ipak, samo 2 studije kombinuju i interdisciplinarne aspekte i održivost, 1 studija se sastoji od pregleda literature o vještinama projektnih menadžera, a nijedna studija ne integriše vještine upravljanja projektima u odnosu na interdisciplinarne timove i održivost.

Na osnovu prikazanog, može se reći da postoje veze između izazova i varijabli povezanih sa radom u interdisciplinarnim timovima i vještinama koje menadžeri projekata moraju da poseduju da bi ih prevazišli, te da ih ima smisla analizirati i sistematizovati u vidu upustava i programa za buduće interdisciplinarne menadžere.

4. CASE STUDY: INTERDISCIPLINARNI PROJEKAT GAŠENJA 3G MREŽE U MOBILNOJ MREŽI TELEKOMA SRBIJA

Najveća promena u tehnološkim smislu, tzv. digitalna era, ima izuzetan uticaj na način na koji pojedinci i preduzeća danas funkcionišu. Na polju mobilnih komunikacija, uvođenje 3G mreža promenilo je naše živote u potpunost jer je uvođenjem 3G mreža u širu primenu **omogućeno je ‘surfovanje’ mobilnim internetom na brzini do oko 14 Mbit/s**. 3G mreže donele su početak ere pametnih telefona koju danas poznajemo.

Mnogi svetski mobilni operateri, lideri na tržištu, planiraju višegodišnje strategije razvoja svoje mobilne mreže kako u pogledu tehnoloških promena tako i u pogledu razvoja novih servisa. Uobičajeno je i očekivano je da se u tom smislu neprestano vrši osvajanje novih frekventnih opsega, pa tako laički rečeno, i razvijati mobilnu mrežu od 2G, preko 3G i 4G tehnologije, do 5G ili čak i 6G.

Međutim, svaki napredak industrije je istorijski gledano često zahtevao i napuštanje postojećih rešenja i koncepata, baš u svrhu postizanja inovacija, većeg profita a u konačnom i opšteg boljitka. Gašenje 3G mreže predstavlja jedan takav korak.

Odluka da se jedna tehnologija 'ugasi' se nikada ne donosi jednostavno, ali upravo unapređenje trenutno vodeće i najraspotranjenije LTE (4G) tehnologije - to i zahteva. Širenje frekventnog opsega 4G mreže na račun frekvencija 3G tehnologije u cilju povećanja brzine protoka data sadržaja je neophodnost koja krajnjim korisnicima donosi maksimalno korsiničko iskustvo (velike brzine prenosa podataka - 10 puta veće nego na 3G tehnologiji - uz moguće istovremeno ostvarivanje postojećih mobilnih servisa tipa govor ili sms).

Jako je važno proceniti trenutak za odluku i kao metodologiju koja može dovesti ovako složeni projekat do željenog cilja. Pripremna faza obuhvata potrebna mnogobrojna istraživanja, formiranje i analizu izveštaja, kalkulacije, predikcije, sagledavanje rizika i opcija, i u konačnom donošenje odluke. Uz to treba obezbediti održivost takvog projekata, pogotovo ako je dugotrajan (višegodišnji), sredstva, agilnost i kvalitetan interdisciplinarni tim.

Realizacija gašenja 3G mreže je primer interdisciplinarnog projekta na kome učestvuje mnogo interdisciplinarnih timova same kompanije i partnerskih firmi, timovi sarađuju međusobno, smenjuju se faze njihovog rada, rezultati prethodnih se prenose kao ulazni podaci sledećim ili se pak u paraleli radi na više istovremenih manjih projektnih celina, sve sa jednim ciljem – razviti najkvalitetniju LTE mrežu po svim tehnološkim i servisnim parametrima (BM Ratel, 4 puta za redom, 2019 – 2022).

U svakoj od faza složenog projekta se formiraju interdisciplinarni timovi sastavljeni od članova različitog (nivoa) obrazovanja i komepticija, specijalista različitih disciplina (ekonomista, inženjera, menadžera prodaje, pravnika), različitih nacija, životnih, kulturnih i profesionalnih navika, jakih individualaca ili stručnjaka, ali i mnogih operativaca bez kojih realizacija projekta nije moguća.

Neophodan uslov za ovakvu odluku bilo je uvođenje VoLTE servisa (Voice over LTE – govor preko 4G mreže), koji je u datom trenutku predstavljao iskorak u tehnološkom smislu (prvo virtualno rešenje na Cloud core-u u Evropi, Ericsson solution), čime su se ostvarile mogućnosti da se pokrene projekat gašenja 3G tehnologije u mobilnoj mreži Telekoma Srbije.

Projekat je pokrenut 2019.te godine i još uvek traje, dok su operateri u SAD u potpunosti okončali postupak a UK bi trebalo da do kraja 2023. završe započete procedure.

Svaku od faza realizacije projekta unutar Telekoma Srbije, ponekada u pralalnim vremenskim intervalima, vodili su interdisciplinarni menadžeri projekta. Interdisciplinarne timovi čine profesionalaci različitih disciplina: analitike, planiranja mreže (kor i pristup), ekonomista, mnoštva inženejra saobraćaja, elektrotehnike, građevine, pravnika, prodavaca, marketing

menadžera, testera kvaliteta mreže, funkcionalnosti servisa, tehničkih rešenja, platformi, uređaja, korisničkog iskustva, operativne službe svih nivoa sa različitih geografskih regija. Partneri su takođe uključeni u projekat kao i njihovi timovi, koji su najčešće multinacionalni, neki članovi tima su sa udaljenim pristupom (Kina, Indija), neki su uključeni regionalno ili lokalno, ali svi integrisani u celovitu sliku – koju nije lako održati.

Rizici su mnogobrojni, od uobičajenih (budžet, vreme, obezbeđenost svih resursa), preko pažnje, volje i ulaganja stakeholdera koje treba održati u ovakvim long-term evolucijama, preko nekih potpuno neočekivanih, kao što je pojava kovida virusa i globalni lock-down svetskih razmera. Uz ovde već opisane izazove upravljanja interdisciplinarnim timovima, dobar interdisciplinarni menadžer je neophodan. Praksa je pokazala da za sada samo iskustvo, intuicija i zdrava logika menadžera, kao i zaista kvalitetan i pouzdan tim – mogu da dovedu do rezultata projekta. Verifikovani alati i uputstva ne postoje, osim opštih osnova projektnog menadžmenta.

5. ZAKLJUČAK

Činjenica je da su inovacije te koje pokreću rast industrije i usluga, a interdisciplinarnost je osnova na kojoj se bazira uspešan koncept rada uspešnog preduzeća.

Iako je mnogo literature do sada napisano na temu projektnog upravljanja, jako je malo rečeno o konkretnim uputstvima menadžerima složenih interdisciplinarnih projekata. U najkraćem i najboljem, može im se poželeti (samo) sreća. Jer i pored svih saveta da treba da osluškuju svoj tim/timove, obezbede međusaradnju članova različitih disciplina i veština, razmenu znanja i protok informacija, a uz to budu agilni na sve promene i izazove – teško je definisati niz jasnih smernica koje će zasigurno dovesti projekat do uspeha. U ovom trenutku bi bilo dragoceno da pojedinci koji su uspeali i doveli interdisciplinarnе projekte do cilja – svoja iskustva podeli sa drugima, ne bi li se pristupilo nekoj vrsti sistematizacije i pravljenja šeme koju treba primeniti, ali gde u startu treba očekivati spremnost menadžera na promene, izazove, samostalna rešenja, donošenje odluka, suočavanje sa ne/rešivim problemima, vraćanje korak unazad da bi se krenulo napred. Dakle, volja, upornost, fokus, vrhunska empatija, sopstvena multidisciplinarnost, komunikativnost, dalekovidost, greške, ali uvek sa jasnim ciljem, su veštine i osobine koje treba da krasi uspešnog interdisciplinarnog menadžera projekta. Jer je on taj koji projekat razvija od početka do kraja i koji vodi tim, a tim su ljudi. Personalne veštine su od ključnog značaja za uspešnost i zato na sopstvenom razvoju treba raditi.

Kada je održivost u pitanju, održivi projekti su sagledani kao “problemi” koji zahtevaju interdisciplinarnе projektne timove za kreiranje rešenja usmerenih ka održivom razvoju. Rad sa ljudima iz različitih disciplina nosi izazove i varijable na koje menadžeri projekata moraju da se pripreme i nauče kako da se suoče sa njima. Takvi izazovi uključuju: pogrešnu komunikaciju, neusklađena očekivanja, kulturološke razlike, različite disciplinske norme i terminologiju, itd. Dakle, da bi napredovali u takvim timovima, menadžeri projekata će morati da poseduju tehničke i netehničke veštine kako bi bili u stanju da vode, koordiniraju i upravljaju specialistima različitih disciplina, a takve veštine uključuju: rešavanje sukoba, fleksibilnost, tehničku ekspertizu, izgradnju tima i još mnogo toga.

Važno je napomenuti da je svaki tim i projekat jedinstven. Stoga, menadžeri projekata treba da razviju svoje kontekstualne i bihevioralne perspektive kako bi se prilagodili i bili fleksibilni u rešavanju problema koji se pojave. Štaviše, iako su jake veštine i iskustvo neophodni da bi menadžeri projekata uspeali, spremnost da uče i vode ljude ka cilju projekta je od presudnog značaja za njihov uspeh.

Konačno, ostaje potreba i tvrđenje da bi trebalo sprovesti više istraživanja iza interdisciplinarnih timova i vještina upravljanja projektima, kako bi se pomoglo razvoju programa obuke i procesa koje menadžeri projekata mogu da koriste kada rade u interdisciplinarnim timovima.

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ZNAČAJ INTERDISCIPLINARNIH TIMOVA ZA OSTVARIVANJE IZVRSNOSTI U PROJEKTIMA

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Apstrakt: U savremenim društvenim i drugim uslovima prisutna su mnogobrojna istraživanja, projekti, o mnogim pojavama i procesima, u koja su uključeni kadrovi iz jedne ili više naučnih oblasti i doisciplina. U istraživačkoj praksi dosta su prisutni i najčešći jednostavni, intradisciplinarni projekti istraživanja, ali, nisu jedini. Analiza naučnoistraživačke i metodološke prakse otkriva postojanje više modela složenih istraživanja: a) model složenog projekta istraživanja sa potprojektima i b) model projekta istraživanja sa više posebnih istraživanja. Za njih je karakteristično da su njihovi projektni timovi sastavljeni od kadrova iz više naučnih oblasti i disciplina, naglasak je na interdisciplinarnom pristupu, kako bi se postigla visoka stopa izvrsnosti, pozitivnih rezultata, efekata i posledica prilikom projektovanja i rezultata istraživanje. Osnovni principi projektovanja i standardizacija se nužno odnose i projektne timove koji su uključeni u neki projekat. Specifičnosti složenih (i jednostavnih) projekata istraživanja izražavaju se kroz odnos između njih i procesa konceptualizacije i rekonceptualizacije, strukturu projekata i proceduru njihove realizacije, kao i u zaključivanju i prezentaciji rezultata, o čemu posebno moraju da vode računa članovi projektnog tima u svakoj fazi i etapi izrade i realizacije projekta.

Ključne reči: istraživanje, projektovanje, konceptualizacija, rekonceptualizacija, procedura.

1. UVOD

Bitan činilac teorijskog i praktičnog mišljenja i saznanja, jeste i sam proces saznavanja pojave. U tom saznavnom procesu imamo, s jedne strane, praktičnu čulnu delatnost i s druge strane teorijsko mišljenje. Praktično čulnu delatnost čini svaka čulna delatnost čoveka, od prostih procesa opažanja do najsloženijih naučnih eksperimenata. Teorijski činilac saznavnog procesa čini teorijsko mišljenje tj. celokupnost procesa koje obavlja ljudski mozak. Praktično čulni i teorijski tj. misaoni, činioči saznanja su povezani u saznavnom procesu, bez jedinstva ova dva činioča nije moguć saznavni proces (Šešić, 1974). Bitna svojstva procesa saznanja su: konstatovanje činjenica na osnovu već stečenog znanja; postavljanje hipoteze i teorija u objašnjavanju činjenica nepoznatih pojava; proveravanje i verifikacija tačnosti postavljenih hipoteza i teorija u praktičnoj primeni koje i predstavlja razumevanje i najsloženijih pojava. Naučno saznanje je sistematsko saznanje, to je „sistem naučnog znanja“, što naglašava D. Tančić „[...] pod sistemom naučnog znanja se obično podrazumeva uređen, povezan, obuhvatan, promenljiv skup naučnih činjenica, iskustvenih generalizacija, naučnih zakona i naučnih teorija, zasnovan na određenim principima“ (Tančić, 2009). Nauka predstavlja najegzaktniju, najistinitiju duhovnu tvorevinu kojom se otkriva stvarnost onakve kakva je. Saznanje do kojih nauka dolazi nisu konačna, njihova tačnost i domet su ograničeni, naučna saznanja se neprekidno produbljuju, dopunjavaju i preciziraju, a time se neka saznanja koja su dotle smatrana istinitim i tačnim pokazuju netačnim i eliminišu se iz nauke.

U društvenim i drugim naukama postoji mnoštvo definicija istraživanja, projekat, projektovanje, projektni timovi, i dr. Kada se govori o pojmu naučnog istraživanja, postavlja

se pitanje: od koje definicije istraživanja poći? Da li od definicija koje precenjuju ulogu teorije ili činjenica (kao što su to činili predstavnici empirizma ili hipotetičko-deduktivnog pristupa i sl.) ili od autora koji smatraju da je istraživanje u stvari ispitivanje ili od autora koji smatraju da je prefiks „naučno“ suvišan... Na prvom mestu, mora se naglasiti, da se sva istraživanja ostvaruju po važećim i proverenim pravilima logike i metodologije što znači da se sva naučna istraživanja moraju odvijati po principu daljih i dubljih saznanja. Istraživanje je izuzetno složen i svrsishodan proces u kom su objedinjene umne, psihičke i fizičke delatnosti; mišljenje, koje mora biti logično, kritično, postepeno, naučno osnovano, predmetno. U svim istraživanjima su zastupljene i intelektualne, manuelne, kombinovane, stvaralačke, rutinske, tehničke i organizacione delatnosti.

Naučna istraživanja, kao pojave i procesi se odvijaju u određenom društvu, na određenom prostoru, vremenu, na koja bitno utiču i određene naučne paradigme i teorijsko-metodološke orijentacije. Bitne odredbe svakog naučnog istraživanja su da je to svesna i svrsishodna, namerna i ciljna aktivnost saznavanja novog određenim naučnim metodama, da ona moraju imati objektivni stav o istraživanoj pojavi, procesu, kako bi zadržala bitna svojstva naučnih istraživanja.

Generalno uzev, prema vrsti istraživanja razlikujemo: teorijska istraživanja, empirijska istraživanja, metodološka istraživanja, amaterska, diletantska istraživanja, masovna i nemasovna; longitudinalna i panel istraživanja, interdisciplinarna ili intradisciplinarna, eksperimentalna ili kvazieksperimentalna, deskriptivna ili eksplorativna, heuristička ili verifikatorna, orijentaciona, dijalektičko–deskriptivna, klasifikatorsko–tipološka, inovatorska, eksplikativna ili prognostička istraživanja, fundamentalna–klauzalna, primenjena, razvojna, akciona ili operativna, komparativna, blic istraživanja; kratkoročna; srednjoročna, dugoročna i permanentna, društvena, politikološka, ekonomska, pravna, vojna, demografska i druge vrste istraživanja.

Društvena i politikološka istraživanja su specifična istraživanja nauke o politici, čiji je predmet društvo, politika, društvene i političke pojave i društveni i politički procesi. Predmet društvenih i politikoloških istraživanja mogu biti minule, aktuelne i buduće društvene i političke pojave, unutrašnje, međunarodne i spoljnopolitičke pojave.

Društvene i političke pojave se društvenim i politikološkim istraživanjima mogu istraživati interdisciplinarno i intradisciplinarno. Istraživanje društvenih i političkih pojava u društvenim i politikološkim istraživanjima se vrši po modelu tipskog predmeta i po modelu procesa istraživanja. Funkcije naučnih, kao i društvenih i politikoloških istraživanja, imaju dve osnovne funkcije, kao što ističu Dragan Tančić i Petar Tančić: „Naučna istraživanja u oblasti društvenih i političkih nauka imaju dve osnovne funkcije: „1. prva funkcija je naučno saznanje o određenim društvenim i političkim pojavama; 2. druga funkcija je da naučno saznanje bude valjana osnova za primenu u društvenoj i političkoj praksi, direktno ili indirektno. U tom kontekstu istaći ćemo dva osnovna iskaza: naučna istraživanja su opravdana ukoliko ispunjavaju ove dve bitne funkcije. Takođe, u navedenom kontekstu možemo govoriti i o naučnom značaju istraživanja dijagnostičkih i prognostičkih metoda i njihovoj primeni, i u futurologiji. Društvena opravdanost istraživanja se sastoji u tome što se novostečena saznanja primenom dijagnostičkih i prognostičkih metoda u društvenim i političkim naukama (kao i u futurologiji), mogu iskoristiti npr. kao polazišta za identifikaciju, dijagnostiku i prognostiku, potom i za normativno i pravno regulisanje društvenih i političkih pojava, samim tim i određenih odnosa u sferi društvenog, političkog sa aspekta

pravovremenog i preventivnog delovanja radi sprečavanja raznovrsnih negativnih društvenih i političkih aktivnosti i akcija po određenu zajednicu“ (Tančić, Tančić, 2016).

2. PROJEKAT ISTRAŽIVANJA, PROJEKTOVANJE, PROJEKTNI TIMOVI

Projekat istraživanja je veoma složen dokument kojim se obuhvataju dve vrste sadržaja: prvo, naučni sadržaj po kome se isti određuje kao naučni dokument i drugo, operativni deo sadržaja po kome se definiše i kao operativni dokument. To je generalno uzev, normativan, planski svrsishodan dokument kojim se iskazuje zamisao procesa naučnog istraživanja od početnog shvaćenog problema do eventualne primene rezultata istraživanja. Projekat istraživanja posmatramo i kao funkcionalnu naučnu i organizaciono operativnu celinu, kojom se propisuje proceduru ostvarivanja procesa od početne ideje do konstituisanja naučnog saznanja i njegovog eventualnog primenjivanja u praksi, gde je svaki deo projekta uslovljen ostalim delovima. Ukoliko projekat nije funkcionalna i proceduralna, standardizovana celina, onda projekt nije valjan. Osnovna uloga projekta istraživanja se sastoji u tome, da on bude valjan naučni osnov i sredstvo upravljanja naučnim istraživanjima.

Projektovanje možemo definisati kao smislenu umnu delatnost ljudi, što podrazumeva akcije istraživača gde on(i) aktivnošću svog uma i drugih i psihičkih procesa saznajeo i artikuliše pojavu koja je naučni problem i artikuliše je u predmet istraživanja, a potom odabira, aktivira i kombinuje postojeća saznanja o njima. Sva ta saznanja povezuje i uspostavlja među njima funkcionalne odnose, formira smislene poretke i svojim kritičkim mišljenjem, na osnovu svega toga i o svemu tome, izgrađuje sopstvene stavove, sudove i zaključke od kojih formira smisaonu, značenjsku celinu - projekat istraživanja.

Projektni tim se formira u skladu sa inicijativama i potrebama naručioca (finansijera) za realizaciju nekog projekta. saglasno bitnim odredbama predmeta i načina istraživanja. U tom kontekstu, u zavisnosti od vrste projekta, neophodno je formirati projektni tim, sastavljen od više izvršilaca, jedne (jednostavni projekat) ili više naučnih oblasti i naučnih disciplina (složeni projekat), a to iziskuje i njihove određene psihofizičke sposobnosti, vrstu i stepen obrazovanja i određene karakterne osobine saglasno projektnim poslovima i zadacima. U svakom projektu naučnog istraživanja, posebno masovnih pojava, projektni tim se sastoji najmanje od: 1) naučnoistraživačkog jezgra, koje projektuje naučno istraživanje i upravlja njegovom realizacijom, obradom i prezentacijom, planira i osmišljava ceo proces. Projektni tim čine: a) rukovodilac istraživanja, b) metodolog, c) statističar-programer i jedan ili više naučnih radnika, istraživača, specijalizovanih za određene oblasti u zavisnosti od projekta. U nekim slučajevima moguće je da jedno lice obavlja više uloga (npr. rukovodioca i metodologa ili metodologa i statističara, itd.); 2) terenskih istraživača i 3) administrativno-organizacionog i administrativno-tehničkog osoblja. Za poslove i zadatke druge i treće vrste, osim već stečenih znanja, neophodno je i posebno znanje i osposobljenost primereno konkretnom projektu istraživanja. To se obezbeđuje posebnom obukom.

3. KONCEPTUALIZACIJA, REKONCEPTULIZACIJA

Istraživanje konceptualizacije istraživanja u društvenim i političkim naukama je pitanje o kojem se realtivno malo raspravljalo u metodološkoj literaturi društvenih i političkih nauka. Razlog ili razlozi nedovoljnog razmatranja ovog pitanja su verovatno usko povezani i uslovljeni sa različitim shvatanjima društva i politike kao pojave, procesa, strukture, norme i sl., i društvenih i političkih nauka, određenja predmeta i metoda društvenih i političkih nauka

i različite istraživačke prakse. Osnovna pitanja na koja u naučnom fondu treba pružiti valjane odgovore, odnose se na određene sadržaje konceptualizacije, njen odnos i veze sa naučnim istraživanjem i projektovanjem i izradom projekta istraživanja. Da li je to početna faza naučnog istraživanja, faza kojom se u bitnoj meri utiče na proces naučnog istraživanja a do realizacije istraživanja predistraživanjem, ili je to sistem naučnih i operativnih aktivnosti koje su preduslov izrade projekta istraživanja ili je to proces izgradnje pojmova u okviru procesa naučnog istraživanja? Mnoštvo pitanja na koje treba u naučnom fondu dati odgovore.

Problemi na koje se takođe moraju pružiti valjani odgovori odnose se i na način izbora istraživane pojave, problema i načine njihove artikulacije. Da li konceptualizacija naučnih, a pre svega društvenih i politikoloških istraživanja započinje sa opažanjem ili na neki drugi način? Kako se razvija proces i procedura konceptualizacije, koji su odnosi i veze između teme, projektnog zadatka, idejne skice, projekta istraživanja, interpretacije i praktikovanja rezultata istraživanja predistraživanjem. Bitni problemi na koje se takođe moraju dati valjani odgovori odnose se i na način i tipski model zamišljanja pojave, problema i predmeta, po kojim pravilima, procedurama. Kako se istražuje konceptualizacija kao predmet, po kojim modelima, da li po modelu tipskog predmeta i po modelu procesa istraživanja ili na neki drugi način? Problem je i opšte shvatanje rekonceptualizacije istraživanja. Da li je rekonceptualizacija sastavni deo konceptualizacije, ili je to posebna i samostalna celina u okviru naučnog istraživanja?

Shvatanja konceptualizacije istraživanja u društvenim i političkim naukama, u postojećoj metodološkoj literaturi više puta i na različite načine je definisano. Konceptualizacija istraživanja i odnos prema konceptualizaciji je uslovljen pre svega shvatanjem naučnog istraživanja i projektovanja istraživanja, strukture projekta istraživanja, odnosom prema određenim paradigmatama, teorijsko- metodološkim pravcima i orijentacijama, kao i odnosom istraživača prema određenoj istraživačkoj praksi. Pored mnoštva razlika u shvatanju naučnog istraživanja, faza naučnog istraživanja, projektovanja i faza projektovanja istraživanja, veza i odnosa naučnog istraživanja i projektovanja istraživanja, nesporno je da možemo identifikovati, uočiti osnovna i opšta shvatanja i postavke o konceptualizaciji istraživanja u društvenim i političkim naukama.

Jedan broj autora (Gud, Het i dr., 1966) pod konceptualizacijom smatraju proces izgradnje pojmova, apstrahovanja i generalizovanja čulnih utisaka. Osnova konceptualizacije su pojmovi, pojmovno određenje. Koen i Nejgel smatraju da je hipoteza potrebna na samom početku istraživanja. Identifikuju problematičnu situaciju ali se ne udubljuju u njeno razmatranje (Koen, Nejgel, 1965). Džon Đui naglasak stavlja na problematičnu situaciju i po njemu istraživanju prethodi i preduslov je „neodređena situacija“, koja pobuđuje istraživanje. Neodređena situacija „postaje problematična u samom procesu, kada se podvrgne istraživanju“. Za njega istraživanje ne počinje prikupljanjem činjenica, niti postavljanjem hipoteza već problematičnom situacijom i određenjem elemenata iste ona postaje osnov problema, traže se moguća rešenja koja se nameću kao ideja (Đui, 1962). F. S. C. Nortrop smatra da istraživanje započinje problemom, analizom problema, svodenje problematične na činjeničnu situaciju. U drugoj fazi se ispituju relevantne činjenice utvrđene analizom u prvoj, prethodnoj, fazi istraživanja i zavdava se opisanim činjenicama (Nortrop, 1968).

Miroslav Pečujlić smatra da je konceptualizacija proces izgradnje pojmova, ali smatra i da je konceptualizacija i uvodna, početna, operacija istraživačkog postupka (ukoliko „istraživački postupak“ tretiramo kao proces istraživanja koji se sastoji iz više faza – prim. aut.) koju svodi na konceptualizaciju istraživačkog problema, koja se sastoji u definisanju predmeta, i to

teorijski i radno, operacionalno. Teorijsko definisanje je logička operacija kojom se pomoću apstraktnih pojmova određuje suština pojave a operacionalna, radna definicija se sastoji u određivanju indikatora. Po postavljanju indikatora, postavljaju se i hipoteze. Ciljeve istraživanja kao bitan elemenat konceptualizacije autor u citiranom radu ne navodi (Pečujlić, 1982), ali u udžbeniku iz 1995. godine (Pečujlić, 1995) u sastavu konceptualizacije obuhvaćeni su i ciljevi. Iz navedenog se uočava da Miroslav Pečujlić ne pravi razliku između problema i predmeta istraživanja i da je neprihvatljivo, da se prvo odrede indikatore pa tek potom hipoteze. Indikatori ili pokazatelji ne mogu biti posebna celina niti mogu prethoditi hipotezama, kako ističe Pečujlić iz razloga, jer su indikatori spoljašne manifestacije unutrašnje suštine i oni se utvrđuju odmah posle formulisanja hipoteza i u vezi su sa varijablama, koje ona sadrži. Pokazatelji ili indikatori su veza između stava hipoteze i instrumentarija kojim će se prikupljati podaci, te se u tom smislu indikatori moraju smatrati sastavnim delom hipoteza.

Rudi Supek razlikuje statičku i dinamičku šema istraživanja (Supek, 1968). Analizirajući date prikaze istraživanja, možemo uočiti dve osnovne postavke, i to, prvo, da konceptualizaciju vezuje za fazu naučnog istraživanja, i to pre svega imajući u vidu konceptualizaciju istraživačkog problema kao početne faze istraživanja i kod statičke i dinamičke šeme istraživanja, i drugo, konceptualizacija se koncentriše u projektovanju istraživanja, i to pri izradi idealnog i praktičnog nacrtu istraživanja kod dinamičke šeme istraživanja. (Supek, Pejčić, 1975) smatraju da je povod i predmet svakog naučnog istraživanja, konkretni čovekov problem, te je i pokretanje naučnog istraživanje u stvari odabiranje predmeta i metoda i otpočinjanje istraživanja. Povod za pokretanje naučnih istraživanja su problemi i iskustvo. Pripremne radnje istraživanja su svrhovite, misaone, teorijske pripreme, početne pretpostavljene zamisli, pojmovnog okvira, ideje, hipoteze, rešavanja problema istraživanja. Razvijena, polazna pretpostavljena zamisao dobija i formu projekta istraživanja. Misaono, teorijsko zadobijanje početne pretpostavljene zamisli čini oslonac empirijskog istraživanja.

Bandur i Potkonjak (1999) pod konceptualizacijom smatraju rad na idejnom, naučnoistraživačkom projektu, formulisanju ideje istraživanja. Ovim delom projekta, koji se ostvaruje u prvoj etapi, fazi u naučnom, pedagoškom istraživanju (mada po istim autorima u pedagoškim istraživanjima se rade tri, a po nekima dva, tako što neki istraživači idejni projekat spajaju sa studijskim a neki ne, a tehnički projekat je ili drugi ili treći projekat u zavisnosti od toga da li se prethodna dva spajaju ili ne) se daju osnovna pitanja na koja projekat treba da odgovori: šta će se i zašto će se istraživati. Studijskim projektom se istraživači opredeljuju kako će odabrani predmet istraživati, opredeljenje za metode, tehnike, instrumente i procedure istraživanja Navedeni autori konceptualizaciju vezuju za projektovanje istraživanja odn. za izradu projekata (Bandur, Potkonjak, 1999).

Novak Milošević smatra da je projektovanje istraživanja svojevrsna konceptualizacija a projekt koncept za istraživanje, ali se ovi pojmovi ne mogu identifikovati, zato što koncept podrazumeva početnu strukturu, bez obaveza da izrazi veze između strukturnih delova a projekat istraživanja ima za cilj da pronikne u veze i odnose između delova predmeta istraživanja. Koncept ne mora a projekat mora da iskaže celovitu zamisao za istraživanje, i što koncept ne sadrži a projekat sadrži niz instrumenata i dokumenata za realizaciju istraživanja (Milošević, 1990).

Bogdan Šešić pod konceptualizacijom smatra teorijsko misaoni proces odnosno misaono određivanje predmeta istraživanja. Bitni momenti procesa konceptualizacije po istom autoru su izbor predmeta istraživanja, proces prethodne teorijske obrade, uočavanje nedostataka,

praznina i nepotpunosti znanja o predmetu koji istražujemo odnosno uočavanje problema. Prvi korak konceptualizacije u smislu rešenja učenih problema jeste postavljanje i definisanje hipoteza o rešenjima problema a završni deo konceptualizacije odnosi se na izbor metoda, provere postavljenih hipoteza i odgovarajućih tehnika preduzetog istraživanja. Konceptualizacija i rekonceptualizacija čine suštinu istraživačkog projekta (Šešić, 1971). Iz navedenog se može zauzeti stav da je konceptualizacija vezana za početnu fazu procesa istraživanja, ali istovremeno i da je naglasak i težište konceptualizacije usmereno ka projektovanju istraživanja, izradi projekta.

Slavomir Milosavljević i Ivan Radosavljević smatraju da su u metodološkoj literaturi rasprostranjena stanovišta o konceptualizaciji kao opštoj zamisli, opštem planu predstojećeg istraživanja i da se u okviru konceptualizacije smeštaju sve faze: od izbora teme, problema, do eventualne rekonceptualizacije. Prema tom shvatanju i projekt istraživanja i rad na njemu bili bi samo deo konceptualizacije, rekonceptualizacije. Po drugom shvatanju, a što i citirani autori naglašavaju, pod konceptualizacijom se može smatrati samo izrada, razvijanje najopštije zamisli o pretpostavljenom, predstojećem istraživanju. Ta zamisao započinje opštom idejom o opaženom odnosu, zapaženom problemu naučne ili praktične prirode. Na osnovu formulisane ideje, imamo preliminarno definisanje istraživačkog problema i njegovo povezivanje sa postojećem naučnim i empirijskim saznanjima, koje ukazuje na dalje mogućnosti istraživanja definisanog problema, te se formira koncepcija istraživanja u najopštijim crtama a valjano naučno istraživanje ne može se izvesti na osnovu opštih odredaba koncepcije, već je neophodna detaljnija i dublja naučna obrada. Ta obrada započinje sa izradom projektnog odnosno istraživačkog zadatka (Milosavljević, Radosavljević, 2000).

U metodološkoj literaturi i pored mnogih razlika postoji opšta saglasnost u nekim osnovnim postavkama o konceptualizaciji istraživanja.

a) Konceptualizacija istraživanja je neophodan segment svakog naučnog, valjano zasnovanog istraživanja. Na osnovu uvida u postojeći naučni fond, raznih nauka i naučnih disciplina, svi autori koji su raspravljali o konceptualizaciji, smatraju da je konceptualizacija bitan činilac svakog naučnog istraživanja.

b) Sledeće pretežno prihvaćeno stanovište među metodolozima raznih orijentacija, ističe se u prvi plan da je konceptualizacija neizbežno prvi (prim. autora: pristalice ovog stanovišta su pretežno autori koji su precizno definisali naučno istraživanje, projektovanje istraživanja, izradu projekta, sa svim fazama i procedurama, i autori koji imaju istraživačka iskustva, bez obzira na pripadnost određenim pravcima ili naučnim paradigmatama.) početni deo, osnovna zamisao naučnog istraživanja, koja se ostvaruje tokom celog procesa naučnog istraživanja.

c) Konceptualizacija je neophodna veza između postojećeg naučnog fonda, naročito teorijskih osnova, postulata, početnih premisa i istraživačkog problema.

d) Ona je veza između meta-teorijskih i meta-metodoloških postavki i teorijskih i metodoloških postavki i istraživanja.

Navedene osnovne saglasnosti nalazimo kako u domaćoj tako i u stranoj metodološkoj literaturi. Njih možemo nazvati opštim saglasnostima koje se odnose na sva istraživanja u svim društvenim i političkim naukama.

Rekonceptualizacija je faza konceptualizacije kojom se vrši provera odnosno usavršavanje ili odbacivanje početne zamisli, ideje, koncepcije, koncepta, modela istraživanja. To je u stvari proces koji, za razliku od konceptualizacije, nije nužno da se postavlja, istražuje, po modelu tipskog predmeta i po modelu procesa istraživanja. Kao faza konceptualizacije,

rekonceptualizacija je zasnovana i uslovljena teorijskim i metodološkim sadržajima iznetim u konceptualizaciji, teorijskim i metodološkim konceptom i modelom istraživanja, koji se ili potvrđuju ili odbacuju po oceni podataka. Opažanje pojava (prim. autora: većina autora, kako domaćih, tako i stranih, smatra da je predmet naučnog istraživanja i konceptualizacije, problem a ne pojava. Međutim, autor ovog rada stoji na stanovištu da je predmet naučnog istraživanja i konceptualizacije, pojava, bilo društvena, politička, ekonomska i druge pojave) a da je problem sastavni deo pojave i njenih manifestacija), procesa, problema, posredstvom čula i posredstvom opažanja i iskaza drugih, artikulacija istraživačkog problema, izrada teme, projektnog zadatka, idejne skice i projekta istraživanja, nesporno da spadaju u konceptualizaciju i rekonceptualizaciju.

Razmatranja, usaglašavanja, usavršavanja, izmene i dopune, izbora istraživačkog problema i ostalih faza izrade projekta do predistraživanja, spada u rekonceptualizaciju istraživanja.

Rekonceptualizacija istraživanja u osnovi podrazumeva dve situacije. Prva situacija se odnosi na potpuno napuštanje početne zamisli, ideje, koncepcije, koncepta i modela izražene u konceptualizaciji, a to znači izradu potpuno nove konceptualizacije. Ovakva situacija u istraživačkoj praksi se retko javlja, jer se pri formulisanju konceptualizacije strogo postupa po određenoj proceduri, počev od izbora i artikulacije istraživačkog problema, pa sve do izrade projekta istraživanja.

U situacijama gde se određene procedure previđaju ili izostavljaju određene faze, mogu se očekivati i totalne rekonceptualizacije. Razlozi zbog kojih se ne poštuju predviđene procedure konceptualizacije mogu biti raznovrsni, počev od nedovoljnog metodološkog, teorijskog i iskustvenog znanja istraživača, nedovoljne obaveštenosti o postojećim naučnim saznanjima, predimenzionirano poštovanje prevaziđenih i isključivih normi raznih teorijskih i metodoloških pravaca, nepovoljni uslovi po samo istraživanja. Druga situacija se odnosi na delimično napuštanje odn. usavršavanje početne zamisli, ideje, koncepcije, koncepta i modela, i tada imamo u vidu delimičnu rekonceptualizaciju.

Kao što smo i istakli, neki autori smatraju da se konceptualizacija odnosi na izgradnju pojmova, te isti autori i rekonceptualizaciju vezuju za definisanje pojmova. Taj pristup ne možemo prihvatiti pre svega iz razloga, jer je iz dosadašnjeg rada evidentno da se konceptualizacija odnosi na čitav proces a ne samo na pojmovni deo. Na tom stanovištu su Viljem Gud- Pol Het, Robert Merton, Paul Lazarsfeld, Miroslav Pečujlić i drugi. Međutim, Bogdan Šešić, sa pravom, ne poistovećuje pojmove konceptualizacije i rekonceptualizacije, već on ističe kao bitnu činjenicu da su konceptualizacija i rekonceptualizacija suština procesa istraživanja i istraživačkog projekta (Šešić, 1971).

Klasifikacija rekonceptualizacije:

1. Totalna, koja se vrši po obavljenom predistraživanju i rezultatima predistraživanja, a što znači totalno napuštanje početne zamisli, ideje, koncepcije, koncepta i modela i pristupanje izrade nove konceptualizacije. Druga situacija, totalna rekonceptualizacija u nekoj od faza konceptualizacije.
2. Parcijalna rekonceptualizacija se odnosi na pojedine delove konceptualizacije, počev od izbora istraživačkog problema do predistraživanja.
3. Tekuće rekonceptualizacije su usavršavanja „u hodu“ početne zamisli, koncepcije, koncepta i modela konceptualizacije istraživanja.
4. Fazne rekonceptualizacije su proces kontinuiranog razvijanja, usavršavanja i dimenzioniranja i kritička analiza početne zamisli, ideje, koncepcije, koncepta i modela

konceptualizacije po fazama. To u stvari znači rasprave, selekcije, zamene i dopune po fazama.

5. Konačna rekonceptualizacija se odnosi na određenje prema konceptualizaciji po završenom predistraživanju u ukupnosti a preko projekta istraživanja, čime se faktički, u celosti, vrši konačna adaptacija prema opštoj zamisli i konkretizacija i dovođenje u skladu sa predmetom istraživanja i njegovim zahtevima.

3.1 PROCEDURA REKONCEPTUALIZACIJE

S obzirom na to da smo u prethodnom delu utvrdili da se pri formulisanju konceptualizacije strogo postupa po određenom redosledu – proceduri, počevši od opažanja pojava, problema, formiranja početne, osnovne ideje, pa sve do formiranja teme, projektnog zadatka, idejne skice, nacrtu naučne zamisli, projekta i da konceptualizacija postoji do testiranja projekta (predistraživanja), može se postaviti pitanje da li rekonceptualizacija ima „svoju“ proceduru. Na ovo pitanje može se dati potvrđan odgovor.

Rekonceptualizacija kao proces usvaršavanja i kritička analiza osnovne ideje, zamisli istraživanja, potvrđuje ili odbacuje valjanost projekta i konceptualizacije. Rekonceptualizacija se odvija po sledećim fazama:

- 1) Rekonceptualizacija preliminarne artikulacije istraživačkog problema;
- 2) Rekonceptualizacija naučne artikulacije istraživačkog problema;
- 3) Rekonceptualizacija teme i projektnog zadatka;
- 4) Rekonceptualizacija idejne skice;
- 5) Rekonceptualizacija nacrtu naučne zamisli, projekta istraživanja a po testiranju projekta predistraživanjem.

3.2 REKONCEPTUALIZACIJA PO OCENI PODATAKA

Testiranje projekta počinje od izbora i artikulacije istraživačkog problema, pa sve do predistraživanja. Prva faza rekonceptualizacije u odnosu na podatke javlja se tokom ostvarivanja uvida u podatke iz postojećeg naučnog fonda, tj. na koji smo način i kojim metodama i tehnikama, u kojoj meri kvantitativno i kvalitativno, podatke prikupili, te se na osnovu tih saznanja razmatra i usavršava ova početna faza. Utvrđujemo da li je prikupljanje podataka u saglasnosti sa konceptualizacijom, osnovnom zamisli, idejom o istraživanju. To je početna faza usavršavanja aktivnosti u vezi prikupljanja podataka. Sledeća faza se odnosi na planove prikupljanja i obrade podataka, njihovo razvrstavanje, klasifikovanje, šifriranja, ukrštanja, tabeliranja i metode koje su korišćenje. U ovoj fazi se navedeni planovi sređivanja i obrade podataka preispituju i usavršavaju saglasno osnovnoj ideji konceptualizacije, otklanjaju greške i pristrasnosti istraživača, koje mogu biti teorijske, metodološke i iskustvene. Rekonceptualizacijom se podaci dovode u vezu sa naučnim fondom i ceni se njihova relevantnost u odnosu na problem i predmet istraživanja, otklanjaju se greške i pristrasnosti u odnosu na konceptualizaciju, sadržaj istraživanja i projekat istraživanja. Ovim delom se podaci dovode u vezu i sa slaganjem sa teorijskim stavovima, metodološkim i iskustvenim pristupima, čime se uklanjaju uočene greške, nedostaci i pristrasnosti i omogućava se valjana zaštita od grešaka pri realizaciji istraživanja.

4. IZLAGANJE REZULTATA I REKONCEPTUALIZACIJA

Izlaganje rezultata o istraživanju predistraživanjem je zasnovano konceptualizacijom i rekonceptualizacijom istraživane pojave, problema i predmeta datog istraživanja, odnosno koncepcijom, konceptom i modelom konceptualizacije o čemu posebno moraju da vode računa članovi projektnog tima. Samo izlaganje izveštaja o istraživanju i rezultata o istraživanju predistraživanjem je sastavni deo procesa konceptualizacije i rekonceptualizacije, u smislu da se izlažu sledeći bitni sadržaji:

- Rezultati do kojih se došlo prethodnim, drugim istraživanjima u okviru određenih nauka, naučnih disciplina a koji predstavljaju osnov, polazište datog naučnog istraživanja;
- Rezultati do kojih se došlo pre izrade izveštaja o istraživanju predistraživanjem;
- Rezultati do kojih se došlo tokom izrade izveštaja o istraživanju predistraživanjem.

Izlaganjem rezultata o istraživanju predistraživanjem se obuhvataju se:

1. Sadržaji koji se bave pojavom, problemom i predmetom istraživanja;
2. Sadržaji koji se bave metodološko-metodskim problemom;
3. Sadržaji koji se bave praktičnim aktivnostima u postavljanju i realizaciji istraživanja, prikupljanju i obradi podataka, izradi izveštaja;
4. Sadržaji o novostecenim saznanjima o pojavi, problemu i predmetu istraživanja.

Izlaganje rezultata o istraživanju predistraživanjem se faktički utvrđuje odnos prema konceptualizaciji, od početne faze naučnog istraživanja pa do predistraživanja. Bitan deo konceptualizacije i rekonceptualizacije i izlaganja rezultata istraživanja čini jezik, naučni jezik. Jezik i stil sadržan u izveštaju o istraživanju i rezultatima istraživanja nauke, naučne discipline u bitnoj meri, u zavisnosti od tipa i vrste istraživanja, ukupnog teorijskog, metodološkog i empirijskog koncepta, iskazuje i određeni kategorijalno – pojmovni i terminološki aparat, simbole, znake koji se u njega ugrađuju.

U naučnoj praksi postoji težnja za formalizacijom, metematizacijom i računarskom prezentacijom rezultata istraživanja. Međutim, bez obzira na sve zahteve, prilikom izrade izveštaja o istraživanju i rezultatima istraživanja predistraživanjem (i istraživanju) mora se imati u vidu da jezik, termini, pojmovi, kategorije mogu da se ostvare samo odgovarajućim definicijama, pri čemu svaki termin u korelaciji sa drugim terminima, označava isti objekat mišljenja, a da je taj objekat istinito zamišljen. Računarski jezici nemaju univerzalna značenja, te se oni mogu praktikovati samo kao pomoćni „servisni“ jezici. Pored toga, pri izlaganju izveštaja u određenoj meri je nužno koristiti i sinonime i homonime, varvarizme, konstrukte, kovanice, šeme, prototipove.

Izlaganje rezultata predistraživanjem ostvaruje se unutar projektnog tima i između naručioca istraživanja. Finalni deo izlaganja su zaključci i preporuke u odnosu na ukupno dobijene rezultate, do kojih se došlo predistraživanjem i koji su osnov za dalji rad.

5. DEMONSTRACIJA PROJEKTOVANJA, IZRADE PROJEKTA ISTRAŽIVANJA

5.1 PROBLEM ISTRAŽIVANJA I FORMIRANJE TEME ISTRAŽIVANJA

Problem istraživanja i formiranje teme istraživanja su sastavni delovi konceptualizacije istraživanja i bitan deo početnih aktivnosti projektnog tima. Primer su masovna ubistva u miru, kao npr. ubistva dece u osnovnim i srednjim školama u SAD, Republici Srbiji u maju 2023. ili zločini u ratnim sukobima, koji su stalno aktuelna i značajna društvena, politička i pravna tema, sledstveno tome, problem istraživanja je generalno oformljen, čime je i konstituisan i društveni realitet koji može biti osnova za istraživanje.

Pošto smo utvrdili da problem realno postoji onda se može pristupiti izboru teme. Temu može predložiti naručilac ili istraživači. Da je izbor teme jedan od najpresudnijih i najodgovornijih činilaca, potvrđuje i Rajnberg koji naglašava da valjan izbor teme osigurava uspeh čitavog rada (Rajnberg, 1948). Kroz temu se izražava paradigma, teorijsko-metodološki pristup i označava poželjan karakter istraživanja, vrste istraživanja, i sl. Prva stvar, prvo pitanje koje se mora razgraničiti, jeste da se utvrdi oblast u kojoj će se vršiti istraživanje odnosno u okviru koje naučne oblasti i naučne discipline i koje sadržaje ćemo da istražujemo.

U praksi se obično javljaju sledeće greške:

1. neodređenost naučne discipline i neodređenost sadržaja,
2. preširoke i preuske teme;
3. istražuju se sve veze i odnosi, uticaji između dve ili više pojava.

Tema se utvrđuje kroz formulisanje projektnog zadatka. Kada se uradi idejna skica, onda je tema pretežno određena a ista je određena kada se uradi teorijsko određenje predmeta istraživanja.

Izrada teme se ostvaruje po određenoj proceduri i u skladu sa modelom tipskog predmeta istraživanja i po modelu procesa istraživanja. Faze izrade teme:

1. konsultovanje saznanja iz postojećeg i dostupnog naučnog fonda, realne situacije, rezultata nekih istraživanja, posrednih;
2. konstatovanje naučnih, teorijskih, empirijskih i metodoloških činjenica;
3. razmatranje kategorijalno-pojmovnog i terminološkog aparata u vezi moguće teme i njihov međusobni odnos.

5.2 PROJEKTNI ZADATAK

Projektni zadatak je deo konceptualizacije istraživanja odnosno deo artikulisane ideje, koncepcije i koncepta u obliku modela. To je dokument koji ima određeni sadržaj i obim u kome projektni tim navodi osnovni problem i predmet istraživanja, bitne činioce sadržaja istraživanja, društvene i naučne ciljeve i svrhu istraživanja, generalnu hipotezu sa kratkim obrazloženjem, vrstu i tip istraživanja i glavne metode istraživanja, potrebna sredstva (uslovi) istraživanja i rokovi projektovanja, realizacija i saopštavanje rezultata kao i forme prezentiranja rezultata. Struktura i sadržaj projektnog zadatka su u osnovi određeni temom. Tokom rasprave i razmatranja projektnog zadatka, projektni tim mora uvek imati u vidu vezu između sadržaja teme, problema i predmeta istraživanja, ciljeva i metoda, tehnika, uzoraka, kao i potrebnog vremena, sredstava i saradnika. Po postizanju tih osnovnih saglasnosti, može

se prići izradi projektnog zadatka. Izrada i razmatranje projektnog zadatka su jedan od bitnih obaveza projektnog tima i delova procesa konceptualizacije.

Prva faza ili preliminarni projektni, tj. istraživački zadatak, razmatra se zajedno sa naručiocem, gde se precizno određuje zadatak i postiže sporazum između određenih učesnika. U ovoj fazi se projektni zadatak kao dokument može menjati i sve rasprave koje se vode su usmerene ka dimenzioniranju projektnog zadatka i sredstava za njegovu realizaciju. Druga faza, definitivno određenje i usvajanje projektnog zadatka se postiže, kada svi učesnici razmatranja projektnog zadatka postignu saglasnosti u vezi ukupnog teksta, u vezi sadržaja istraživanja, mogućeg predmeta istraživanja, iskazane kroz određenje teme, potrebno vreme za projektovanje i realizaciju istraživanja, određenje generalne hipoteze, metoda, tehnika i sredstava, koje će biti primerene u istraživanju. Projektni zadatak predstavlja osnovu za izradu idejne skice projekta istraživanja i isti, kada se usvoji, može da bude kompromis između naručioca i istraživača.

5.3 IDEJNA SKICA

Izrada idejne skice je faktički faza konkretizacije modela. Kao dokument, idejna skica je i skraćena verzija projekta istraživanja koju su uradili članovi projektnog tima. Njena izrada je i teorijsko i metodološko istraživanje. Radom na idejnoj skici se traže i razjašnjenja koja su izostala iz projektnog zadatka. Ona je po sadržaju slična sadržaju projektnog zadatka, ali je detaljnija. Sama izrada idejne skice i njeno razmatranje spadaju u konceptualizaciju i rekonceptualizaciju. Rasprave koje se vode u ovoj fazi u vezi razmatranja projektnog zadatka i idejne skice, primedbe, kritike, izmene i dopune, dorade, nužno zahtevaju određene korekcije koje su u osnovi određenog stepena rekonceptualizacije.

Idejna skica je u stvari razrađeni projektni zadatak, proveru predmeta istraživanja, valjanost i primena metoda i njihove usaglašenosti sa predmetom, ciljevima, raspoloživim sredstvima i samom situacijom, u kojoj će se odvijati istraživanje i saopštavati rezultati. Kod idejne skice su posebno razrađeniji predmet, hipoteze, gde se pored generalne, daju i posebne hipoteze, način istraživanja i planovi istraživanja. Aktivnosti u vezi izrade idejne skice nužno, kao osnovne zahteve, nameću potrebu određenih razjašnjenja, preispitivanja, te imamo dve faze, procedure izrade idejne skice:

Prva faza procedure izrade idejne skice – predlog koji se razmatra;

Druga faza – dogovorena i usvojena idejna skica, koja je osnov za izradu nacrtu naučne zamisli i projekta istraživanja.

Ukoliko se radi o složenim projektima istraživanja, imamo situacije:

Prva situacija, gde imamo generalni projekat sa više podprojekata, gde se izrađuje jedan projektni zadatak – jedna idejna skica sa posebnim delovima za svaki podprojekat, čime se ostvaruje veza celine i dela a sami podprojekti su određeni generalnim projektom.

Druga situacija se javlja kada imamo generalni projekat, koji se ostvaruje kroz više samostalnih projekata. Tada, generalno treba uraditi projektni zadatak, idejnu skicu, posebno za generalni projekat, a posebno za samostalne projekte a čime se postiže određenost i povezanost svih zadataka, predmeta i ciljeva istraživanja u samostalnim projektima i generalnom projektu.

5.4 NACRT NAUČNE ZAMISLI

Nacrt naučne zamisli sastoji se od formulacije problema, predmeta istraživanja, ciljeva istraživanja, hipoteza, načina istraživanja, naučne i društvene opravdanosti. Svaki od navedenih činilaca nacrta naučne zamisli ima svoje posebno određeno mesto i u skladu sa tim i posebnu ulogu i funkcije a što projektni tim uvek treba da ima u vidu i da se toga pridržava. Valjano naučno istraživanje podrazumeva doslednu i veoma preciznu izradu svakog navedenog dela nacrta naučne zamisli, u protivnom se može reći, da nema sva svojstva naučnog istraživanja. Zašto? Iskustva iz istraživačke prakse su potvrdila neophodnost poštovanja određene istraživačke prakse, procesa, normi, pravila, procedura pri projektovanju istraživanja.

Odstupanja su moguća, neretko se dešava da se nacrt naučne zamisli ne izradi, ne razvije u celini, ali se onda postavlja pitanje valjanosti ukupne koncepcije, koncepta, modela i dobijenih rezultata naučnih istraživanja, a što za posledicu ima negativne efekte, rezultate i posledice, po ukupan značaj i rezultate naučnih istraživanja, ali i negativan i društveni značaj, jer izostaju i opravdana i objektivna društvena očekivanja u pravilnom rešavanju određenih društvenih ili političkih pitanja.

5.5 PREDISTRAŽIVANJE

Konceptualizacija kao predmet istraživanja istražuje se i po modelu predistraživanja. Naime, po izradi projekta istraživanja kao jedne od faza procesa istraživanja, projektni tim pristupa krajnjoj fazi procesa istraživanja i konceptualizacije, realizaciji predistraživanjem i rekonceptualizaciji na osnovu testiranja valjanosti konceptualizacije i projektovanja istraživanja kao oblika istraživanja i predistraživanja – rezultata predistraživanja kao argumenata o valjanosti konceptualizacije i samog projekta. Predistraživanjem se vrši praktična, teorijska, empirijska i metodološka provera valjanosti konceptualizacije odn. provera valjanosti svega što je do predistraživanja urađeno. To je u suštini testiranje ukupne koncepcije, koncepta i modela i rešenja koja su usvojena u projektu istraživanja. Ukoliko se predistraživanjem ne potvrde, ukupna i posebna valjanost, onda se pristupa rekonceptualizaciji, koja može biti potpuna ili delimična.

Procedura provere valjanosti konceptualizacije i projekta se odvija u više faza:

Prva faza – To je faza u kojoj se odvijaju rasprave o izboru istraživačkog problema, preliminarnoj artikulaciji istraživačkog problema;

Druge faze – Rasprave o naučnoj artikulaciji istraživačkog problema;

Treća faza – Rasprave o temi, projektnom zadatku, idejnoj skici, nacrtu naučne zamisli;

Četvrta faza – Rasprave o izradi delova projekta istraživanja.

Peta faza: Testiranje koncepcije, koncepta, modela predistraživanjem:

1. Teorijska provera,
2. Metodološka,
3. Empirijska,
4. Logička.
5. Realizacijom predistraživanja:
 - 5.1. planiranja istraživanja,
 - 5.2. organizovanje realizacije istraživanja
 - 5.3. izvođenje istraživanja

6. ZAKLJUČAK

Centralni činilac konceptualizacije, rekonceptualizacije, projektovanja, izrade projekta istraživanja, predistraživanja, rezultata istraživanja jesu subjekti odnosno članovi projektnog tima. U zavisnosti od njihovih naučnih i stručnih znanja, sposobnosti, kreativnosti, zavisice i realizacija izvrsnosti svakog projekta i njegova primena u naučnom fondu i društvenoj praksi.

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PROJECT MANAGEMENT AND STRATEGIC FORESIGHT

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Abstract: The purpose of this paper is to examine the links between strategic foresight and project management practices, using past research and the existing literature. A project aims to achieve a specific goal through a unique set of interconnected tasks and the effective utilization of resources. It has a limited timescale, so it requires adaptability and risk management. The project plan is built on assumptions and estimations, which create uncertainty about completing the project aim within the planned parameters. Strategic foresight is an approach to think about the uncertainties in a structured manner, anticipating and planning for potential future scenarios that may have an impact on an organization's goals and objectives. Strategic foresight can help to inform the project management process and result in improved risk management, better decision-making, and increased agility. Project managers can incorporate strategic foresight into their processes in a variety of ways, such as scenario planning activities, trend analysis, and flexibility in project plans. Strategic foresight can help companies anticipate future changes in the project-based economy, build strategic project-based partnerships, and navigate the economy's projectivization.

Keywords: strategic foresight, VUCA, strategic planning, portfolio management, project management

1. INTRODUCTION

A project is defined as "an endeavour to achieve a specific goal through a unique set of interconnected tasks and the effective utilization of resources" (Clements & Gido, 2014). The project has a clear goal that is usually defined in terms of deliverables, timeline, and budget, and it is carried out by a series of interdependent tasks that are completed in a specific order, utilizing diverse resources such as people, organizations, equipment, materials, and facilities. A project's limited (particular) timescale, or finite time duration, is one of its main qualities. We could argue that the project must operate within controllable parameters such as timeframes and resources and must achieve the expected - planned for - results. However, the project is fraught with uncertainty, necessitating a high level of adaptability and risk management. The project plan, which is created ahead of time for execution, is built on certain assumptions, which should always be clearly documented because they influence future planning and delivery. Furthermore, a project is built on a series of estimations, such as the time required to complete a work, the cost associated with resources, or the availability of resources at the time they are required. This combination of assumptions and estimations creates uncertainty about completing the project aim within the planned parameters.

Furthermore, projects are frequently defined in opposition to operations, in the sense that "all work can be described as fitting into one of two types: projects or operations" (Kloppenborg, 2012). In that sense, operations consist of the ongoing work required to ensure that the organization continues to function effectively in comparison to the characteristics of project uniqueness, or the fact that some projects can be very different from any other work an organization has performed up to that point. The organization's senior leadership aims to determine the strategic direction and develop its vision as a "vivid description of the preferred

future"(Kloppenborg, 2012) as well as a mission statement as a means to attain the vision and various strategic goals as desired outcomes. Once the organization's strategic objectives have been determined, they are implemented through both ongoing operations and short-term projects. Many projects in large organizations are arranged in portfolios, which are defined as "collections of projects...grouped together to facilitate effective management of the work to meet strategic business objectives" (Kloppenborg, 2012).

So, one could argue that the organization's future is outlined, using strategic planning, in vision and mission statements to generate objectives that are brought to life and realized through operations and projects, which are sometimes bundled into portfolios.

We would also argue that portfolios, as a collection of more or less connected projects, have a higher level of uncertainty than individual projects due to the increased complexity and interdependence of critical assumptions and estimates.

Simultaneously, there is an awareness of growing unpredictability in the external environment in which a company function. Over the last few decades, the corporate world has evolved drastically, and we now live in a connected culture where change can be fast-paced, constant, and unpredictable. Rapid technological advancements have produced an environment in which the internet, smartphones, and social media are pervasive, while global events such as the 2008 financial crisis, the COVID pandemic, and, most recently, the conflict in Ukraine have exacerbated the sense of turbulence, danger, and unpredictability.

The sense of certainty, stability, and familiarity that individuals were accustomed to has been replaced by a condition of change. This type of environment can be represented using the "VUCA" abbreviation, which stands for "Volatile," "Uncertain," "Complex," and "Ambiguous" (Bennett & Lemoine, 2014). Following the 9/11 terrorist attacks in 2001, the United States Army War College was one of the first institutions to utilize the VUCA term. Military planners were concerned about the emerging radically different and unfamiliar worldwide security environment, so they coined the term VUCA to describe it. In his book, *Leaders Make the Future*, Bob Johansen (2009) of the Institute for the Future modified VUCA for the corporate world. He used it to represent the turbulent and unpredictable forces of change that can harm organizations, and he said that managing in the face of the four VUCA dangers requires new skills, attitudes, and behaviours.

There is a strong case to be made for projects as the most significant approach for transforming the VUCA world's issues into good changes (Nieto-Rodriguez, 2021). The operations element of the job has typically been associated with increasing efficiency, uniformity, speed, and overall work output. However, in recent years, productivity growth in the Western world has been nearly flat, because (required) improvements cannot be made via traditional efficiency methods as utilized in operations, but can be achieved through projects, which are now becoming a crucial model for producing value. Since 2010, project management has grown to be one of the greatest areas of business in the United Kingdom, with an estimated £156 billion in gross value contributed to the UK economy. According to some research (Nieto-Rodriguez, 2021), the global value of the project-oriented economy would rise from \$12 trillion in 2013 to \$20 trillion in 2027. Senior executives and managers are expected to spend at least 60% of their time on project-related tasks in the near future. So, if we know that even a single project is fraught with uncertainty, how can we expect to face even more uncertainty in the future, when the majority of work-related activities revolve around projects? How should we handle our projects in the VUCA world?

2. STRATEGIC FORESIGHT

Strategic Foresight, often known as Futures Studies, is a discipline used by organizations to collect and analyse information about their future operational environment (Dator, 2019). Trends and developments in their political, economic, social, technological, and legal settings, for example, can be included in this information. Strategic foresight is an organized and methodical approach to anticipating and better preparing for change. It is about investigating many probable futures and the opportunities and difficulties they may provide. We then apply those principles to make better judgments and take action right away. Strategic foresight does not seek to provide conclusive answers about the future. Foresight views the future as a growing reality that is only partially visible in the present, rather than a predetermined destiny that can be fully anticipated in advance. There are no hard truths concerning the future, and proof is always insufficient. The goal is not to 'get the future right,' but to broaden and redefine the range of probable possibilities that must be considered (Hines, 2015).

To put it simply, foresight is not the ability to predict the future. Instead, foresight is insight into what might be rather than what will be. As a result, the purpose of foresight is not to foretell but to assist us in enhancing the plan and rethinking our strategic objectives.

Strategic Foresight as a field has been around for decades; colleges in the United States offer a master's degree in Strategic Foresight. For years, major corporations have used the power of foresight to their advantage. One well-known example is the oil and petrochemical behemoth Royal Dutch Shell. During the late 1960s oil crisis, Shell changed its approach and effectively drove itself to the top of the business, a feat attributed to the use of scenario planning (Cornelius et al., 2005). Today, companies like Intel, Ford, and Disney have joined Shell in hiring futurists to use foresight techniques for overall strategy creation and innovation.

Strategic foresight study and practice (also known as corporate foresight) has a long history dating back to the late 1940s. Organizational practice had already reached a peak in the 1950s, thanks to Gaston Berger's "La Prospective" School in France and Herman Kahn's work at the Rand Corporation in the United States. Many companies, including Cisco, Daimler, Deutsche Bank, Deutsche Telekom, France Telecom, L'Oréal, Pepsi, Siemens, and SNCF, have invested in developing corporate foresight (CF) departments since then. The assumption is that CF will allow these organizations to predict trends ahead of competitors, develop a deeper understanding of how such trends will affect their organization, find the most effective reaction, and eventually achieve a competitive advantage (Rohrbeck & Kum, 2018).

Researchers René Rohrbeck and Ménès Etingue Kum (2018) published the findings of their study of 83 enterprises spanning health to manufacturing, banking to fashion to food production. The firms reported the corporate foresight procedures in place in 2008, and the researchers followed each organization through 2015, noting which had improved, which had remained the same, and which had worsened over that seven-year period.

The findings of Rohrbeck and Kum (2018) clearly demonstrated that "future-prepared firms have a significantly higher likelihood of making it to the group of industry outperformers." These companies achieved excellent profitability, competitiveness, and market expansion. The findings of the study demonstrate unequivocally that strategic forethought pays

financially. Organizations can secure their position at the forefront of their industry by performing systematic foresight.

In businesses, there are numerous frameworks for strategic foresight. One of the most basic foresight models (Lum, 2016) consists of four steps:

1. Past - how has our investigation's problem changed over the years? What caused such changes?
2. Present - Which of those change forces are active again, are there any new ones, and what could accelerate or slow down changes?
3. Futures - What are the issue's logical alternatives (scenarios), opportunities and threats, and who will fight or lead the change?
4. Aspiration entails setting new goals and visions.

Once the new vision is in place, the company may resume regular strategic planning and goal formulation, followed by implementation via operations and projects.

There are numerous foresight tools and frameworks available to help improve the quality of questions addressed and debated. Andy Hines et al. (2015) created some of the most effective and widely mentioned information on how to successfully execute strategic foresight. It consists of six steps:

1. Framing
2. Scanning
3. Forecasting
4. Visioning
5. Planning
6. Acting

The activity of strategic foresight begins with framing the problem. It aids in defining the scope and focusing exploratory efforts on the long-term future of that specific topic. As a result, strategic foresight deals with inherent uncertainty and necessitates a different mindset than just getting the proper data or precise knowledge. After defining the scope of the investigation, the following stage is to scan the surroundings for information and trends. The scanning phase's goal is to identify a mix of driving forces (macrotrends or megatrends) that indicate the most likely future, as well as some insights into prospective change drivers (weak signals) that could lead to an alternative future (Hines, 2015). Forecasting then works with developing such potential futures further. Many organizations, if not challenged by the foresight process, think that the future will be similar to the past (or present). Forecasting entails developing a large number of alternative and innovative alternatives and then ranking them according to various criteria (probability, impact, desirability, etc.). The goal of forecasting and the entire foresight process is to put out a variety of prospective futures so that decision makers can decide how to better prepare for them today. The visioning phase of the process addresses the need to inquire, "So what?", which means to connect thoughts of each possible future with the organization now, in the present. What each conceivable future scenario might have for the organization. This is the stage at which the organization expresses its future ambitions, anxieties, and aspirations, which are based on the work done in earlier levels. It concludes with a vision of the desired future. The planning step connects the vision to the action and seeks to build a strategy. The strategic foresight approach to strategic planning employs traditional strategy development tools and processes while emphasizing future uncertainty, the need for contingency plans, focusing on human context

and societal drivers rather than technological drivers, and designing a more flexible approach. Finally, strategic foresight must result in resource allocation decisions and planning. As a result, the Acting phase is primarily concerned with communication, in order to make abstract knowledge collected in earlier steps more concrete. Some features of the action as a foresight process include the request for alternative actions to be considered if alternative futures emerge, as well as the development of intelligence systems to continuously monitor drivers, trends, and weak signals beyond the present.

3. WHAT DOES THIS MEAN FOR PROJECT MANAGEMENT PRACTICES?

Strategic foresight is essentially about anticipating and planning for potential future scenarios that may have an impact on an organization's goals and objectives. It entails taking into account numerous perspectives and prospective consequences and using this information to guide decision-making processes.

Project management, on the other hand, is the planning, execution, and control of projects in order to achieve certain goals within a set schedule, budget, and scope.

The connection between these two domains is that project management is an important instrument for executing strategic foresight. In other words, project management may assist companies in carrying out their strategic foresight strategies.

Strategic foresight, for example, may anticipate prospective possibilities or challenges that a business will face in the future. Project management can assist the business in creating and implementing initiatives that are especially tailored to handle these possibilities and difficulties. As a result, the organization is better equipped for the future.

Furthermore, strategic foresight can help to inform the project management process. Taking a longer-term view, for example, allows businesses to foresee any changes or interruptions that may arise during the course of a project and alter their plans accordingly. This can aid in the prevention of delays, cost overruns, and other issues that may develop during project execution. The challenge is to successfully combine these two processes in order to improve organizational performance.

Project managers are accountable for meeting particular targets within a set schedule and budget. However, the success of a project is also affected by external factors such as market changes, technical advances, and geopolitical shifts. Strategic foresight can assist project managers in anticipating and preparing for potential future scenarios that may affect the success of their initiatives.

Incorporating strategic foresight into project management processes can result in a number of advantages (Heger & Rohrbeck, 2012), including:

- Improved risk management: Project management professionals can detect potential risks and
- build contingency plans by evaluating various future situations.
- Improved decision-making: Strategic foresight can provide useful insights into developing
- trends, prospective opportunities, and potential difficulties. Project management experts can make better decisions if they examine these observations.

- Increased agility: By anticipating probable future scenarios, project managers can devise
- plans to respond rapidly to market shifts or other external circumstances.

Project managers can incorporate strategic foresight into their processes in a variety of ways, including scenario planning activities to discover probable future scenarios and prepare responses to these scenarios, trend analysis to detect new patterns that may have an impact on the success of their projects and flexibility in project plans to enable for changes in reaction to external environment changes.

Project management professionals may secure the success of their projects in an increasingly uncertain and complicated corporate environment by taking a proactive approach to strategic foresight.

Portfolio management, by offering a framework for aligning project portfolios with strategic objectives (Kloppenborg, 2012) while also managing uncertainty and change, can act as a bridge between strategic foresight and project management.

To begin, portfolio management enables organizations to prioritize and align their project portfolios with their strategic objectives, which is an important aspect of project management. Organizations can establish a portfolio of initiatives that match with their long-term aims by determining strategic priorities.

Portfolio management, on the other hand, enables firms to remain nimble and adaptable in the face of uncertainty and change, which is an important component of strategic foresight. (Hadjinicolaou et al., 2021).

Furthermore, portfolio management may enhance communication and collaboration among many stakeholders involved in strategic planning and project management. Portfolio management can assist bridge the gap between these two techniques by offering a common vocabulary and framework for reviewing and prioritizing initiatives.

4. PROJECTIVISATION OF THE ECONOMY AND STRATEGIC FORESIGHT

According to the Harvard Business Review (Nieto-Rodriguez, 2021), the concept of projectivization of the economy refers to the increasing predominance of project-based labour as a fundamental driver of economic growth and organizational success. Strategic foresight can be a valuable tool for firms in anticipating and responding to changes in the project-based economy in this setting, in the post-Covid19 setting. According to Nieto-Rodriguez (2021) there are several lessons for a project leadership during future crisis, including:

1. Leadership needs to understand complexity and interplay of megatrends, e.g., related to climate change,
2. Central role of partnerships and adaptive management for the robustness of the system,
3. Understanding both the data and the lack of data in decision making,
4. Amplifying resilience and sustainable solutions over low – cost solutions in setting the objectives, and
5. Seeing new opportunities after major changes in the (business) landscape.

Here are some examples (Nieto-Rodriguez, 2021), of how strategic foresight might be applied in the context of economic projectivization:

Overall, strategic foresight can assist companies in navigating the economy's projectivization by offering a framework for anticipating and responding to changes in the project-based landscape. Organizations can establish a more agile and adaptive approach to project-based work that is better suited to meet the needs of a changing economic landscape by utilizing strategic foresight tools.

5. CONCLUSION

To conclude, the process of projectization of the economy necessitates the development of new tools and methodologies for project management in a dynamic and uncertain business landscape. Strategic foresight can provide useful insights and tools to assist companies projectized and negotiate the complexity and uncertainty of the business environment.

Strategic foresight allows companies to predict market changes and emerging trends, identify opportunities and risks, develop robust strategies, and foster an innovative and creative culture to support their project management activities.

Finally, incorporating strategic foresight into project management techniques can help companies become more agile, flexible, and adaptive, allowing them to stay ahead of their competitors in an increasingly complicated and uncertain business landscape.

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INTERDISCIPLINARY APPROACH TO FINANCE: SYNERGY BETWEEN TRADITIONAL, BEHAVIORAL AND NEUROFINANCE

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Abstract: Traditional finance is developing and evolving through interconnections with a variety of related as well as completely diverse scientific disciplines. The interweaving insights from variety of disciplines provide a completely new perspective on financial theory, especially the field of financial decision-making. This paper will show the evolution of financial theory from traditional decision-making models, through behavioral finances that have served as a bridge to the most up-to-date, highly promising knowledge provided by neurofinance. Traditional finances have based their theories on how investors should behave, behavioral finance uses insights from psychology to investigate how investors actually behave, and neurofinance relying on neuroscience goes a step further and allows us to understand why investors behave this way. In this paper we examine main aspect of traditional, behavioural and neurofinance, explaining how each of them contribute to a better understanding of financial decision-making process. The paper explores the importance of synergy provided by an interdisciplinary approach to finance by combining psychology, sociology, neuroscience, biology with finance and management.

Keywords: Traditional finance, Behavioural finance, Neurofinance

1. INTRODUCTION

Science is increasingly interdisciplinary. The problems of modern business require an interdisciplinary approach, they require the interference of different scientific disciplines, some of them related but increasingly truly diverse, too. It seems that in today's development the incompatible merges, and that this is the only sure way of further development. As a result of these processes, new scientific disciplines are emerging.

The same thing happens in the field of finance, the development of finance is moving in the direction of its connection with other, even truly diverse scientific disciplines. The reason lies in the perceived limitations of traditional finance, and even in the evidence that casts doubt on the viability of some of the basic postulates on which traditional finance rests.

Traditional decision-making models assume that people are rational. In traditional finance, it is assumed that decision-makers should be given a starting set of assumptions and axioms that will ensure a rational decision. The rational aspect of decision-making is evident and clear, but the emotional aspect is completely ignored (Obradović, Latinović, & Dmitrović, 2018).

Behavioral finance looks at finance from a broader perspective, combining finance with psychology and sociology (Turcan & Dedu, 2010). They try to explain how emotions influence decision-making by explaining systemic biases and deviations from rational decision-making.

Finally, to answer the question of why investors behave impulsively and not rationally, the human brain must also be involved in the research.

2. TRADITIONAL FINANCE

Traditional finance stipulates that man is a rational being, a traditional "homo economics" that is driven by the maximization of personal utility and therefore makes rational decisions. It is only necessary to have all the information necessary to make decisions available.

Utility theory of utility is based on the presumption that humans are rational beings, possessing perfect information that allows them to make decisions so as to maximize their welfare. Alternatives are evaluated by multiplying the expected outcomes by the probability of their occurrence. The efficient market hypothesis states that an individual cannot constantly beat the market because all available information is rationally evaluated and embedded in price at all times. According to portfolio theory, investors will choose a portfolio based on expected return and variance, whilst optimization is achieved through diversification. All portfolios will lie at an effective frontier, and personal risk preference will determine the individual portfolio.

All these theories rest on the primary assumption that investors are rational beings. However, the key assumption about rationality turned out to be incorrect. The idea of limited rationality is increasingly prevalent, which considers that people's behavior is influenced by other people's behavior, but also that people are very prone to react emotionally, especially in a stressful environment. Furthermore, there are cases of extraordinarily successful investors, such as Warren Buffett, who managed to beat the market, appearance of prolonged economic bubbles etc. Experimental studies showed inconsistency in an individual's risk preferences, as well as in the non-alignment of an individual's preferences with newly available information. More importantly, traditional finance fails to answer many important questions, such as what makes an investor successful, why some people get rich and some don't, why highly educated people, even Nobel laureates don't succeed in the market, is there anything more than just following financial theories and calculations, understanding risk and returns and above all, why people don't behave in accordance with the utility theory.

Behavioral finance is questioning the belief that people are rational and the statement that prices reflect all available information, as efficient market hypothesis states. In fact, it is said that investors are not rational, instead they are simply normal (Rashid, Ahmad, & Tariq, 2022). It was no longer enough to classify any deviation from traditional financial theory as an "anomaly". It has become clear the necessity of further development of finance in the direction of connecting with other scientific disciplines.

3. BEHAVIORAL FINANCE

Traditional finance did not consider the role of emotions in financial decision-making (Obradović, Latinović, & Dmitrović, 2018). Today, it is quite clear that emotions shape the perception of investors, which leads to the fact that the decisions they make will not be quite rational.

Emotions and expectations are crucial in financial decisions. Research has shown that people want to avoid regret and this avoidance significantly influences the decisions they make. People in a good mood and high self-confidence are more inclined to make more optimistic decisions and take more risks.

Nobel laureates Kahneman and Tversky (Kahneman & Tversky, 1974) (Kahneman & Tversky, 1979) have shown that people put more weight in losses than in gains. Also, people tend to overestimate low probabilities and underestimate moderate and high risks. The utility theory is particularly undermined by the findings that people do not have a consistent attitude towards risk, they are risk-taking when it comes to losses, but exhibit a risk aversion when it comes to gains.

Behavioral experiments in finance have shown how people evaluate financial information, especially when it comes to financial decisions that are uncertain, time-limited, risky, and strategic in nature. Of immense importance are findings regarding how different biases, emotions, stress or individual differences such as gender, personality traits, genetic inheritance or neuro-material affect the way financial decisions are made.

However, behavioral finances also have certain limitations. They explain only behavior that can be observed from the outside, but they do not explain why or how this behavior occurs. Also, they are not able to quantify emotions or determine the internal source of emotions and the resulting behavior (Shalini, 2012). All this imposes the next step, which involves exploring the human brain to be able to understand how and why it affects the (ir)rationality of investors.

4. NEUROFINANCE

Practice has shown that to succeed in the market, it is not enough to be smart and well educated. Success does not depend solely on education, effort, and motivation. The cause is increasingly sought in the brain electrochemical composition of individual investors. In order to understand the way investors make decisions, it is necessary to “enter the brain” of investors and study the way it works before, during and after making decisions.

Financial theory gradually must consider the concept that the default option by which the human brain works is not rational but emotional decision-making. According to traditional finance, investors make decisions to maximize their utility and wealth, whereby utility and wealth are understood as those that are measured and derived from commodities and money.

However, it is necessary to look at a broader concept that can be seen if we allow the influx of biology and psychology according to which utility is only one aspect of a higher goal that can be defined as maximizing biological readiness as a chance for survival and overall well-being. Worthy of attention and intriguing view is that the observed deviations from optimal economic choices can in fact be biologically optimal choices, because yet the human brain has evolved over a million years surviving in the natural environment rather than in the financial market. As financial decisions are very different from the natural environment, assumptions about the financial world are much easier violated, and when assumptions about the world are violated, various cognitive illusions appear, because based on incorrect assumptions the brain creates wrong perceptions.

Neuro finance explores how and why people make financial decisions by combining neuroscience and neurobiology, sociology, psychology, finance, and management. They place a major emphasis on the view that the brain is the source of all our assessments, decisions and overall economic behavior.

Neuro finance provides data that can explain the behavior of investors, by interpreting the neural mechanisms that occur. They examine how the brain processes financial information and makes decisions to enhance the model of financial decision-making. Behavioral finance provides a physiologically justified alternative explanation for the perceived shortcomings of standard finance.

Research in neurofinance studies how decision-makers behave just before, during and after a decision is made by examining the neurological basis of emotions and the role of neurons in financial decision-making. This is achieved by monitoring the activation of individual differentiated regions in the brain, independently or in interaction with each other, when making different financial decisions. Activation of a particular part of the brain can indicate what behavior will follow. These researches can be done using functional magnetic resonance imaging (fMRI), magnetic resonance imaging (MRI), electroencephalography (EEG), positron emission tomography (PET), computed tomography (CT), stable-state typography (SST), magnetoencephalography (MEG), transcranial magnetic stimulation (TMS), but also by simply monitoring heart rate, galvanic skin reaction, eye movement, or hormonal and genetic analysis (Jinda & Bahl, 2016) (Turcan & Dedu, 2010). Experiments have shown that structural differences in specific brain networks that can be seen on magnetic resonance imaging partially emphasize individual differences in financial decisions. Furthermore, fMRI scans show that different brain regions are activated when investors are facing with losses and gains.

5. CONCLUSION

Traditional finance explains how people should behave, behavioral finance provides insight into how people really behave and react when making financial decisions, and neurofinance explains why investors behave this way and why these reactions occur. The growth in these fields is really fast, and most probably synergy between traditional, behavioral and neuro finance will improve efficiency and enable better prediction of how investors behave, leading to growth and further development of financial markets as a whole (Tseng, 2006).

Research in the field of finance from a neurobiological perspective has uncovered erroneous assumptions on which decisions are based, contributed to the explanation of confusing financial phenomena and clarifying individual differences among investors in terms of leadership skills, decision-making, risk attitude and information processing.

Further development possibilities are inconceivable, an interdisciplinary approach can contribute to better selection of personnel, but also management in better predicting behavior, and performance of employees in various positions, as well as adequate training considering biological differences, such as genome, pharmacological system, morphology and the way the brain is functioning.

And finally, traditional, behavioral and neuro finance are not contradictory to each other, on the contrary they perceive finance from different angles enabling creating complete picture.

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PRIMENA PRINCIPA TEORIJE IGARA U AGILNOM RAZVOJU SOFTVERA

APPLICATION OF GAME THEORY PRINCIPLES IN AGILE SOFTWARE DEVELOPMENT

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Apsarakt: Agilne metodologije su postale jedne od najzastupljenijih kada je u pitanju proces razvoja softvera, iz razloga što pružaju visok nivo fleksibilnosti i prilagodljivosti promenama. S druge strane, teorija igara predstavlja matematički pristup strateškim interakcijama racionalnih agenata. S obzirom na to, neki od najbitnijih alata u okviru upravljanja razvojem softvera primenom agilnih metodologija su saradnja, kolaboracija i komunikacija, dok oblast teorije igara pruža dodatan uvid upravo u interakcije koje se zasnivaju na komunikaciji, saradnji i

kolaboraciji. Samim tim postavlja se pitanje na koji način se principi teorije igara mogu primeniti prilikom agilnog razvoja softvera. U ovom radu je pružen pregled literature koja izučava korelaciju između ove dve oblasti. Dat je pregled istraživanja koji su fokusirani na modelovanje igara primenom principa teorije igara koje predstavljaju interakcije do kojih dolazi prilikom agilnog razvoja softvera. Takođe, moguće je i uvideti benefite koje je primena teorije igara u datoj oblasti do sada proizvela, kao i zaključke koji se vezuju za naredne korake koji bi mogli biti preduzeti, kao i načini na koje bi prikazani modeli mogli detaljnije biti definisani za individualne razvojne timove i preduzeća.

Ključne reči: Agilne metodologije, upravljanje razvojem softvera, teorija igara, strateške interakcije.

Abstract: Agile methodologies have become one of the most prevalent when it comes to software development processes, due to their high level of flexibility and adaptability to changes. On the other hand, game theory represents a mathematical approach to analyzing strategic interactions between rational agents. Given this, some of the most important tools in managing software development using agile methodologies are collaboration and communication, while the field of game theory provides additional insights into interactions based on communication, collaboration, and cooperation. Therefore, the question arises as to how game theory principles can be applied in agile software development. This paper provides an overview of literature based on correlations between the two areas. The paper provides a review of studies focused on modelling games using game theory principles that represent interactions that occur during agile software development. Furthermore, the benefits of applying game theory in this field can be seen, as well as the conclusions related to the next steps that could be taken, and ways in which the presented models could be more precisely defined for individual development teams and companies.

Keywords: Agile methodologies, managing software development, game theory, strategic interactions.

1. UVOD

IT industrija i oblast razvoja softvera je imala izuzetno značajan i pozitivan uticaj na biznis i ekonomiju u poslednjih nekoliko decenija, od kreiranja novih poslova i uloga u organizacijama do celokupnog povećanja produktivnosti i ohrabrivanja inovativnosti. Samim tim je bitno uvideti da poboljšavanje efektivnosti i efikasnosti u razvoju softvera mogu značajno i da utiču na pospešivanje i održivost biznisa i stvaraju mogućnost za kreiranje novih proizvoda i efikasnijih procesa i aktivnosti. Kao i u drugim industrijama i delatnostima, kada je u pitanju razvoj softvera, bitno je napomenuti da efikasnost razvoja može biti direktna posledica načina upravljanja razvojem i timovima koji rade na stvaranju istog, iz kog razloga je menadžment timovima u razvoju softvera jedna od značajnijih tema današnjice.

Agilne metodologije za upravljanje projektima i razvoj softvera predstavljaju metodologiju koja definiše temelje za upravljanje različitim delatnostima poslovanja. Poslovanje u okviru IT industrije i razvoju softvera sa sobom nosi dva aspekta, tehnički i ljudski aspekt, i samim tim bitno je razmatrati neophodne metode i alate za upravljanje tehnologijom i znanjem, ali i ljudskim faktorom i interakcijama. Agilne metodologije predstavljaju ne samo osnovu za upravljanje razvojem softvera, već iziskuju i određenja ponašanja i stavove od članova tima, menadžmenta i svih individua koje primenjuju datu metodologiju (Dybå i dr., 2008). Samim tim, međuljudski odnosi i interakcije su raznolike i mnogobrojne i mogu se odigravati između različitih pozicija i članova tima, što iziskuju znanje i uvid u različite tipove ponašanja, ljude i znanje o tome koji su njihovi primarni ciljevi kao i ciljevi vezani za organizacije i samog softverskog proizvoda.

S druge strane, teorija igara je oblast koja ispituje i proučava ponašanje racionalnih igrača u strateškim interakcijama (Bočkova i dr., 2015). Principi teorije igara pružaju mogućnost modelovanja situacija u kojoj pojedinci ili grupe stupaju u interakciju i samim tim pruža mogućnost analize različitih strategija koje je moguće preduzeti (Bočkova i dr., 2015). Teorija

igara je u oblasti menadžmenta značajno uticala na percepcije i predikcije koje menadžeri mogu da sagledaju u veoma ranim fazama poslovanja.

Uz pomoć principa teorije igara i istraživanjima vezanim za primenu tih principa u oblasti razvoja softvera, omogućen je uvid u različite šablone ponašanja koji se mogu pojaviti i definisanje opšte prihvaćenih pravila i procesa, ali i upotrebu dodatnih alata za radionice sastanke i razvoj novih načina za pospešivanje produktivnosti i motivacije. Korelaciju između projektnog menadžmenta u razvoju softvera i teorije igara, prvi put su identifikovali Boehm i Ross (Gavidia-Calderon i dr., 2020), a u daljem radu će upravo biti dat pregled različitih načina putem kojih se principi teorije igara mogu primeniti u agilnom razvoju softvera.

S ciljem boljeg razumevanja na koji način se principi teorije igara mogu primeniti u oblasti agilnog razvoja softvera, u drugom poglavlju ovog rada definišu se osnove agilnih metodologija i bitni koncepti za razvoj softvera, kao i osnovni koncepti teorije igara, sa primerima igara i situacija koje se dešavaju prilikom razvoja softvera koje se mogu modelirati primenom principa teorije igara. U trećem poglavlju je pružen zaključak i definisane su dalje smernice na koji način bi principi teorije igara mogli dalje da se primenjuju prilikom razvoja softvera.

2. PRIMENA PRINCIPA TEORIJE IGARA U RAZVOJU SOFTVERA

Kada je reč o razvoju softvera, mogu se definisati sledeće ključne aktivnosti: programiranje, testiranje, pisanje dokumentacije, prpratne marketinške aktivnosti, upravljanje svim aspektima poslovanja (rizikom, budžetom, ljudima itd.). Takođe postoje i prpratne aktivnosti na projektu razvoja softvera kao što je planiranje, raspodela zadataka, osiguravanje da se vremenska ograničenja i rokovi ispoštuju i omogućavanje adekvatne komunikacije. Ovako definisane aktivnosti predstavljaju osnov za izučavanje primene principa teorije igara u razvoju softvera, i pružaju uvid u moguće situacije i interakcije do kojih dolazi i koje mogu biti modelirane.

2.1. AGILNE METODOLOGIJE I RAZVOJ SOFTVERA

Rapidan porast i razvoj IT industrije, i dinamični zahtevi i okruženja popularizovali su agilne metodologije kao osnovni pristup razvoja softvera. Agilne metodologije se koriste u industrijama koje su podložne čestim promenama i inovacijama, a najzastupljenije su upravo u IT industriji. Agilnost se održava u iterativnom razvoju, gde su sve faze od planiranja, implementacije i testiranja odvijaju u manjim iteracijama, čime se stvaraju manji softverski proizvodi, ali češće, i kao brži odgovor na zahteve korisnika. Osnovne vrednosti Agilnih metodologija su definisani dokumentom koji se naziva Agilni manifesto, i one su sledeće (Manifesto for Agile Software Development, n.d.):

- individue i njihove interakcije su važnije od procesa i alata
- softver koji radi je važniji od detaljne dokumentacije
- kolaboracija s korisnicima je važnija od pregovaranja za ugovor
- važnije je odgovoriti na promene nego pratiti plan

Takođe, u Agilnom manifestu definisano je i 12 principa agilnih metodologija koji odražavaju potrebu za kooperacijom, kako tima sa korisnicima i sponzorima, tako i unutar samog tima.

2.2. OSNOVNI KONCEPTI TEORIJE IGARA

Oblast teorija igara je široko primenjena u različitim industrijama, oblastima poslovanja, ali i opštim situacijama u kojoj se ispituju strateške interakcije racionalnih igrača. Primena principa teorije igara se najčešće ogleda u situacijama u kojima je neophodno doneti odluku, izborom neke od mogućih strategija i gde su ishodi tih odluka od strane različitih igrača međusobno povezani, tj. odluke jednog igrača direktno utiču na odluke i ishode ostalih igrača. Osnovna pretpostavka teorije igara je da su igrači racionalni, odnosno da teže najboljem mogućem ishodu za sebe, uzimajući u obzir da su i drugi igrači takođe racionalni. Teorija igara posmatra kooperativne igre, gde igrači imaju opciju dogovaranja ili neki vid kooperacije, i nekooperativne igre, gde svaki igrač igra za sebe, pod pretpostavkom racionalnosti igrača. U nekooperativnim igrama, Nešov ekvilibrijum predstavlja rešenje igre, i dat je kombinacijom strategija igrača koje su najbolji odgovor jednih na druge, gde nijedan igrač nema podsticaj da odsupa od strategije date ekvilibrijumom. Zanimljivo je da iako teorija igara analizira racionalna rešenja, ona ne moraju uvek biti najbolji ishodi po igrača, kao što se ni igrači ne moraju držati nužno njih. Razlog ovakve tvrdnje upravo leži u društvenom, odnosno psihološkom aspektu ove discipline, i činjenici da su igrači agenti sa različitim iskustvima, znanjem i ponašanjem, kao i da u svakoj interakciji postoje različiti spoljni faktori koji mogu uticati na svakog igrača (Kuzmanović, 2017).

U poslednjih nekoliko decenija mnogi istraživači kao što su Gibbons, Dixit, Nalebuff, Brandenburger i Chakravorti su kroz različite modele igara istraživali na koji način se principi teorije igara primenjuju u oblastima menadžmenta, u kojoj meri se pruža uvid za različite aspekte poslovanja i značaj i relevantnost preporuka koje se mogu definisati iz takvih modela za samu disciplinu, ali i za pojedinačne projektne menadžere (Muegge, 2017).

2.3. RAZVOJ SOFTVERA KAO NEKOOPERATIVNA IGRA

Principi teorije igara se mogu primeniti zarad otkrivanja razloga za neuspeh softverskih projekata, konkretnije, modelovanjem nekooperativne igre može da se uoči konflikt između individualnih ciljeva i ciljeva projekta, što je jedan od glavnih razloga za neuspeh. Grechanik i drugi autori u radu (2004) definišu model u kome se posmatraju aktivnosti razvoja softvera kao strateške interakcije, dok su igrači: korisnici, programeri i menadžeri. U tom pogledu menadžer ima strategije da smanji troškove razvoja, da poveća cenu softvera i da ubrza isporuku, korisnik ima strategije da smanji cenu proizvoda na tržištu, da poveća broj funkcionalnosti i da kupi što kvalitetniji proizvod po što nižoj ceni, a programer ima strategije da zadovolji zahteve posla, poveća sopstvenu vrednost na tržištu i da poveća zavisnost ostalih igrača od sebe. Na Slici 1 je data matrica preferencija iz koje se vidi da dokle god menadžeri (M) i korisnici (C) imaju pozitivne isplate, isplate za programera (D) će biti negativne, što potvrđuje pretpostavku da se globalni ciljevi projekta ne poklapaju nužno sa individualnim ciljevima članova tima (Grechanik i dr., 2004). S obzirom na to, predlog rešenja ovakvog problema koji bi omogućio i da se postigne najbolji ekvilibrijum bi bio da preduzeće teži da definiše isplate koje bi za svakog igrača bile pozitivne u slučaju kada projekat uspe, što se često može ostvariti kreiranjem koalicije između menadžera i programera.

Variable \ Player	M	C	D
Cost	-1	0	1
Price	1	-1	0
Speed	1	1	-1
Features	1	1	-1
Quality	0	1	-1
	2	2	-2

Slika 1. Matrica preferencija (Grechanik, M., & Perry, D. E., 2004)

2.4. UTICAJ VREMENSKOG PRITISKA NA KVALITET SOFTVERA

U okviru razvoja softvera, kao i na svim drugim projektima rad je vremenski ograničen, i celokupni projekat je podeljen na manje zadatke, koji imaju svoje vremenske rokove. Teorija igara postavlja model u ispitivanju da li vremenska ograničenja i pritisak utiču na kvalitet softvera koji se razvija, korišćenjem prečica. Postavlja se pitanje da li se broj prečica može smanjiti ukoliko se učestalost postavljanja nerealnih rokova promeni. U ovakvom modelu koji definišu Basten i ostali autori (2021) apstrahuje se veza između vremenskog pritiska i kvaliteta softvera u situacijama kada ne postoji jasno definisan rok i smanjivanje kvaliteta je odluka donesena isključivo od strane programera. Vremenski pritisak definisan kao verovatnoća da se ispostavi da je rok zadatka nerealistična, odnosno vremensko ograničenje za zadatak ne može

biti ispoštovano u zadatom okruženju i sa alociranim resursima. S druge strane, prečice se definišu kao softverski nedostaci koje su namerno urađene zarad manjeg vremena implementacije odnosno završetka zadatka i smanjuju kvalitet softvera, a najčešće su poznate samo programerima. Dva igrača, odnosno programera, se takmiče za priznanje od strane projektnog menadžera koje može biti u vidu povišica, benefita, promocija itd. Strategije koje igrači mogu izabrati su da li će prijaviti nemogućnost da ispoštuju zadati rok ili će izabrati da zadatak obave uz korišćenje prečice. Iz modela igre se zaključuje da ukoliko je verovatnoća manja od kritične vrednosti, broj prečica se povećava sa povećanjem verovatnoće da rok neće biti ispoštovan. U suprotnom, ukoliko je verovatnoća veća od kritične vrednosti, broj prečica koje se preduzimaju je skoro nepostojeći. Slično, ukoliko je verovatnoća nula i broj preduzetih prečica je nula (Basten i dr., 2021). Samim tim, model potvrđuje pretpostavku da kontinualan vremenski pritisak ne utiče na kvalitet projekta iz razloga što programeri postaju svesni da je to norma, i ne postoji pravi pritisak na njihov rad. Odatle je moguće zaključiti da ukoliko programeri učestvuju u proceni truda potrebnog za zadatak, rokovi će biti postavljeni realnije i programeri će verovati u kredibilitet vremenskog ograničenja, čime se smanjuje vremenski pritisak i postiže bolji kvalitet.

2.5. ANALIZA PROGRAMERSKIH PRAKSI KROZ TEORIJU IGARA

Još jedan primer primene teorije igara u razvoju softvera, jeste model igre saradnje u kojoj su igrači front-end i back-end programer. Gavidia-Calderon i ostali autori u radu (2020) govore o modelu u kome dva programera zajedno razvijaju softver i za to su po ugovoru plaćeni 50% naknade na početku i 50% naknade po završetku softverskog projekta. Takođe dva programera mogu da ostvare još 50% od ukupne zarade ukoliko je projekat završen pre krajnjeg roka. U datom modelu programeri imaju dve strategije da sarađuju ili da rade individualno, bez saradnje, s tim da ukoliko sarađuju garantovano je da završe pre isteka roka.

Istraživanja su takođe dala odgovor na pitanja kako se može formalizovati proces razvoja softvera i kako maksimizirati produktivnost razvoja softvera kroz podsticaje i destimulacije. Procesi razvoja softvera mogu uključiti nekoliko metodologija za razvoj softvera, među kojima su vodopad model razvoja, iterativno-inkrementalni i spiralni model. Modelovanjem igara primenom pruža se uvid u izbore koje individue prave, što dalje pruža uvid u veliki broj interakcija, među kojima može biti i alokacija resursa na projektu ili rešavanje konflikta. Yilmaz i ostali autori u radu (2010) pružaju uvid u model situacije u kojoj se prikazuje način na koji se mogu optimizovati raspodela zadataka i planiranje funkcionalnosti koje će se razvijati, time što se usklade sa preferencijama zaposlenih ili se istražuju najbolji načini za brz razvoj softvera. U radu je prikazano i na koji način su Vajja i Prabhakar istražili

proces dizajniranja arhitekture, tako što su modelovali konflikte kao problem koji se rešava principima teorije igara, dok su Hazzan i Dubinsky prikazali na koji način izvor problema u razvoju softvera može biti takmičarski stav između članova tima.

3. ZAKLJUČAK

Primena principa teorije igara u oblasti agilnog razvoja softvera je relativno nov koncept i pretežno je zasnovan na analizi situacija i interakcija relevantnih za savremeno poslovanje. Samim tim, postoji svega nekoliko primera iz prakse koji su analizirani u radu, međutim svako istraživanje predstavlja presedan za određeni aspekt poslovanja u oblasti agilnog razvoja softvera, i kao takvi mogu služiti za dalja istraživanja, ali i za kreiranje opštih modela koji se mogu koristiti u razvoju softvera.

Bitno je napomenuti da su isplate u modelovanim igrama, ili definisane uopšteno ili su vezane za dato istraživanje, što znači da se dalje mogu prilagođavati, čime se omogućava da dati modeli budu primenljivi i na druge softverske projekte i razvojne timove. Međutim, odavde se uviđa i prepreka datih modela, s obzirom na to da je teško generalizovati opšte modele, bez uzimanja u obzir da svaka kompanija i tim ima individualne vrednosti, programe za motivaciju i benefite. Neophodno bi bilo jedino da se u daljem modelovanju uključe vrednosti karakteristične za svaki individualni softverski projekat, kao što su vrednosti poslovne kulture, benefiti, sistemi nagrađivanja ili sankcije, kao i različite ograničavajuće faktore, poput veličine, prioriteta, misije i vizije projekta, kao i individualne ciljeve članova tima itd. S druge strane, s obzirom na to da je donekle moguće uopštiti ove modele, oni mogu služiti kao dodatan resurs za znanje i analizu razvojnim timovima i menadžmentu. Odavde se takođe zaključuje da je potrebno preporuke definisane primenom principa teorije igara u oblasti razvoja softvera dodatno testirati i primeniti na stvarne sisteme i timove, i time potvrditi njihov značaj i tačnost kada se uključe i faktori prirode ljudi i naravi članova tima, što je plan daljeg istraživanja.

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FOSTERING INTRAPRENEURSHIP: EMPOWERING INTERNAL INNOVATORS TO TRANSFORM BUSINESSES

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Abstract: By establishing a culture that nurtures intrapreneurship, organizations strive to unlock the untapped potential of their internal innovators. Therefore, this paper explores the significance of intrapreneurial behaviour and intrapreneurial projects in driving business transformation and achieving sustainable growth while emphasizing the need to empower employees to think and act like entrepreneurs within the company's ecosystem. Recognizing intrapreneurs and harnessing their capabilities to fuel innovation and enhance overall performance appears to be essential for generating breakthrough solutions and remaining competitive in today's dynamic business landscape. Thus, the paper offers insights on key intrapreneurship enablers and highlights the importance of allocating resources and infrastructure to support intrapreneurial projects. Proactive risk management approach that is essential in overcoming challenges that may arise during the intrapreneurial processes has also been covered in the study and focuses on mitigating both internal and external issues that may impede intrapreneurial success. Accordingly, this paper serves as a comprehensive guide for organizations seeking to foster intrapreneurial behaviour, optimize intrapreneurial projects, and seize the transformative opportunities they present.

Keywords: Intrapreneurship, corporate entrepreneurship, business transformation, innovation, change management, transformative projects

1. INTRODUCTION

The lack of an entrepreneurial spirit in the corporate world prompted the development of the concept of intrapreneurship in the 1980s (Hisrich & Kearney, 2012). However, its presence in today's ever-changing business environment is essential for overcoming challenges and creating value for both organizations and their customers. Thus, intrapreneurship is now recognized as a practice that enables, fosters, and encourages entrepreneurial behavior within large organizations, enabling them to maintain competitiveness, empower human capital, enhance overall performance, and successfully drive changes (Wunderer, 2001; Hisrich & Kearney, 2012; Huang et al., 2021). The phenomenon of intrapreneurship can manifest in any part of an organization and there is no one-size-fits-all approach. However, anyone has the potential to become an intrapreneur given the existence of a promising initiative, strong leadership, and adequate resources allocated to a particular intrapreneurial endeavor.

While providing clear guidelines for fostering intrapreneurship and empowering internal innovators may seem a tough task, the paper aims to uncover the key prerequisites for establishing intrapreneurship and gaining a competitive edge in terms of business transformation and improved performance. Through the study and examination of these prerequisites, our aim is to support organizations in creating an environment that nurtures internal innovators and unleashes their transformative potential.

2. ESTABLISHING A CULTURE OF INTRAPRENEURSHIP

Many authors agree that the seeds of intrapreneurship should be deeply planted in the educational system, which currently remains unable to recognize, nurture and shape both intrapreneurs and entrepreneurs (Lindberg et al., 2017; Huang et al., 2021; Fleck et al., 2021). The first step towards creating an atmosphere that supports entrepreneurial and intrapreneurial initiatives can be observed in reshaping educational approaches, not only in schools but also in organizations that miss the opportunity to transform their businesses through various employee development programmes (Gibb, 1987; Eilenberg, 2012; Fleck et al., 2021). Therefore, integrating appropriate in-house education approach, along with promoting entrepreneurial values and traits, usually results in building an entrepreneurial mindset among employees, thus allowing them to become intrapreneurs and co-innovators, thereby enhancing organization's performance (Wunderer, 2001; Murray Gillin et al., 2019). Accordingly, intrapreneurs are considered entrepreneurs within an organization who manifest inventive behaviour and strive to create value by undertaking internal and intentional projects, which should be supported from within the organization (Fleck et al., 2021; Huang et al., 2021).

Hisrich and Kearny (2012) state that "intrapreneurship involves overcoming the inertia, rigidity, rules and regulations, and bureaucratic nature of an existing organization to create something new – a new way of doing things, a new system, and sometimes even a new product or service". This confirms transformative power of intrapreneurial projects and denotes intrapreneurship as conducive to generating new ideas, translating them into innovative projects, and winning the competitiveness game (Venn & Berg, 2013; Badoiu et al., 2020). On the other hand, the lack of support and understanding for intrapreneurial projects unambiguously leads to significantly lowered performance and employee happiness which are grounded in the culture of intrapreneurship and inseparable of innovation and inventiveness as common traits of intrapreneurial behavior (Molina & Callahan, 2009; Badoiu et al., 2020). Thus, if intrapreneurship does not exist in any form within the organization, the chances of achieving desired growth levels are unlikely to occur (Auer Antoncic & Antoncic, 2011).

To conclude, establishing a culture of intrapreneurship is crucial for empowering employees to adopt intrapreneurial behavior and to start thinking outside the corporate box. Considering that any intrapreneurial initiative may lead to reshaping the everyday business environment and gaining a competitive edge, which benefits both organizations and their employees, the culture of intrapreneurship emerges as an imperative to sparking changes, delivering better solutions, and disrupting markets (Huang et al., 2021; Pratono, 2022).

3. RECOGNIZING INTRAPRENEURS AND HARNESSING THEIR POTENTIAL

According to Huang et al. (2021), intrapreneurship stems from the convergence of three interrelated domains – innovation, entrepreneurship, and sustainability, which share commonalities, particularly in generating novel solutions, embracing risks, and ensuring business continuity as their foremost confluence. These common features can serve as strong indicators for identifying intrapreneurial tendencies within an organization; however, to fully unlock the transformative potential of intrapreneurial efforts, it is essential to meet the minimum set of required prerequisites. Therefore, individual enablers, organizational enablers, and institutional enablers, which could affect the environment in both positive and negative manners, should be regarded as guiding principles for recognizing, nurturing, and harnessing intrapreneurship and intrapreneurial behaviour (Antoncic & Hisrich, 2003;

Vargas-Halabí et al., 2016; Woo, 2018; Badoiu, 2020; Huang et al., 2021; Falaras & Moschidis, 2023).

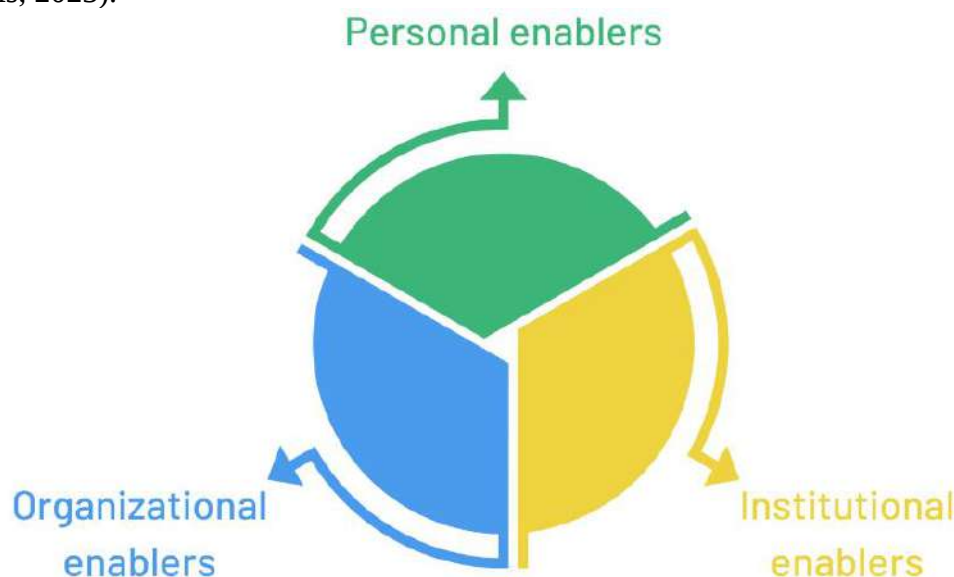


Figure 1. Key enablers of intrapreneurship

Individual enablers usually include personal traits, skills, capabilities, competences, attitudes, judgements, preferences, and experiences that are conducive to developing and performing intrapreneurial behaviour, such as openness, awareness, conscientiousness, extraversion, curiosity, creativity, emotionality, career adaptability, industry- or market-specific knowledge, ability to assess objectively, etc. (Vargas-Halabí et al., 2016; Woo, 2018; Badoiu et al., 2020; Huang et al., 2021). Organizational enablers are mostly perceived as organizational culture, leadership style, top management support, rewards and reinforcement policies, failure tolerance, commitment to innovation and development, boundaries absence or removal, time and resource availability, work design, etc., which all contribute to the establishment of the aforementioned intrapreneurial culture and recognizing employees who could become intrapreneurs transforming businesses and delivering high-end products and services (Antoncic & Hisrich, 2003; Auer Antoncic & Antoncic, 2011; Badoiu et al., 2020; Huang et al., 2021). Represented by national culture, laws and regulations, level of bureaucracy, adaptability of the educational system and state support for entrepreneurship, intrapreneurship, and innovation in general, institutional enablers are also important for recognizing and harnessing the potential of innovators at the firm level (Wunderer, 2001; Falaras & Moschidis, 2023).

The lack of these enablers may cause the significant decrease in the levels of inventiveness, performance, quality, and employee satisfaction (Auer Antoncic & Antoncic, 2011); therefore, we believe that intrapreneurship and growth are strongly intertwined and interconnected. Additionally, enabling intrapreneurship evenly at the individual and organizational levels and as much as possible at the institutional level is considered necessary for entering new markets, establishing new businesses and/or new ventures, taking tremendous risks, reinventing processes, creating new products and services, and gaining competitive advantage in turbulent times (Antoncic & Hisrich, 2003; Auer Antoncic & Antoncic, 2011; Hisrich & Kearney, 2012).

4. ALLOCATING RESOURCES AND INFRASTRUCTURE TO INTRAPRENEURIAL PROJECTS

Once we establish the intrapreneurial culture and develop capacities for recognizing and nurturing intrapreneurs, it is essential to provide them with the resources and infrastructure to undertake intrapreneurial projects and successfully achieve the desired outcomes. Huang et al. (2021) point out that “resource availability is crucial to employees’ involvement in intrapreneurial activities” which encompasses all types of resources that are required in the implementation of intrapreneurial projects. Finance resources are generally regarded as the primary resource on which all other type of resources depend to some extent; these may include innovation funds, rewards, investments in research and development (R&D), etc. (Vargas-Halabí et al., 2016; Deprez & Euwema, 2017; Huang et al., 2021). Technological capabilities are also recognized as important resources supporting intrapreneurship and serve as the driving force behind the predominance of ITC companies in the fields of corporate innovation and market disruption (Benitez-Amado, 2010; Urbano et al., 2013; Badoiu et al., 2020). However, intellectual capital is emerging as ultimate resource for organizations enabling intrapreneurship and proving to be indispensable condition of innovation and business transformation within the corporate world (Urbano et al., 2013; Asiaei et al., 2020).



Figure 2. Resources required to accomplish intrapreneurial success

To achieve success in intrapreneurial projects, employees should be supported in establishing the necessary communication infrastructure, and it is required to clearly address the organization’s strategy and development goals (Huang et al., 2021; Ravina-Rippol et al., 2023). Irrespective of human capital being a component of intellectual capital, we must reaffirm the power of people and their inclination to innovate, drive change and facilitate transformation, which unequivocally positions them as the most valuable asset within the organization.

5. DEALING WITH RISKS AND CHALLENGES TO ENSURE INTRAPRENEURIAL SUCCESS

Being an intrapreneur pushing the boundaries of an organization and transforming the everyday environment is never an easy task. At any stage of intrapreneurship, challenges may arise and jeopardize the success of intrapreneurial endeavours; therefore, identifying and mitigating these events and circumstances becomes the highest priority for both top management and employees.

Drawing upon the literature review, we can distinguish four groups of challenges that are associated with the development and establishment of intrapreneurship – managerial, technological, organizational, and human capital challenges. Managerial challenges manifest as a lack of the top management support for intrapreneurial endeavours and their limited involvement in fostering intrapreneurial culture (Deprez & Euwema, 2017; Huang et al., 2021). Technological challenges, often categorized as resource challenges, arise from the unavailability of allocating appropriate resources to specific intrapreneurial initiatives, particularly concerning technological tools and infrastructure crucial for achieving transformation (Urbano et al., 2013; Huang et al., 2021). Organizational challenges are not typically listed as a distinct category, but they manifest as inertia, bureaucracy, and resistance to changes; these challenges mostly intertwine with managerial and technological risks (Hisrich & Kearney, 2012; Urbano et al., 2013). Human capital challenges, also referred to as personnel-related challenges, encompass the impediments arising from the lack of individual intrapreneurial initiatives, as well as employees having traits, skills, knowledge, and tendencies that qualify them for future intrapreneurs (Urbano et al., 2013; Vargas-Halabí et al., 2016; Deprez & Euwema, 2017; Woo, 2018).

6. CONCLUSION

Intrapreneurship has emerged as a vital practice in the modern business environment, enabling organizations to overcome challenges and create value for themselves and their customers. Therefore, fostering intrapreneurship and empowering employees to engage as co-innovators is a complex yet essential endeavor for organizations striving to transform their businesses and achieve sustainable growth. By establishing a culture of intrapreneurship, recognizing and harnessing the potential of intrapreneurs, allocating key resources to the intrapreneurial projects, and addressing the risks and challenges following them, organizations unambiguously can unlock the transformative power of intrapreneurship and enhance innovativeness, competitiveness, and overall business performance. Moreover, anyone has the chance to become an intrapreneur in an adequate environment – where innovation, entrepreneurship and sustainability meet, intrapreneurship will arise.

Looking to the future, fostering intrapreneurship will continue to be a critical aspect for organizations aiming to thrive in today's ever-changing business context. Consequently, wider deployment of intrapreneurship requires organizations to embrace a supportive culture, invest in resources and infrastructure, and provide continuous learning and development opportunities for employees. Upon rethinking intrapreneurship once again, it becomes evident that facilitating and nurturing intrapreneurship is a strategic approach that supports success and enables long-term value creation.

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UNAPREĐENJE EFEKTIVNOSTI KOMUNIKACIJSKIH PROJEKATA KROZ SARADNJU SA INFLUENSERIMA

ENHANCING COMMUNICATION PROJECT EFFECTIVENESS THROUGH INFLUENCER COLLABORATION

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Apstrakt: Usled ekspanzije influencer marketinga, kao specifične oblasti digitalnog marketinga, izražena je potreba za definisanjem teoretskog okvira kojim bi se formalizovao proces komercijalne saradnje sa uticajnim ličnostima u onlajn okruženju, što bi omogućilo kvalitativnu analizu efektivnosti i kvantifikovanje rezultata ovog procesa. Influencer marketing kampanje po svojoj strukturi, procesu, trajanju i načinu upravljanja resursima predstavljaju komunikacijske projekte. U radu su prikazane faze u upravljanju projektom influencer marketinga, kroz identifikaciju i analizu ključnih aktivnosti koje determinišu njegovu efektivnost. Metodom dubinskih intervju sa stručnjacima i menadžerima iz oblasti marketinga, predstavnicima kompanija i agencija koji duži vremenski period u realizaciji komunikacijskih projekata sarađuju sa influencerima, utvrđeno je koji kriterijumi se koriste za izbor konkretnog influensera, saradnika na komunikacijskom projektu, na koji način se upravlja sadržajem i formatom poruka koje plasiraju influenceri o brendu, koji su najveći izazovi u upravljanju projektom saradnje sa influencerima, kao i koji su ključni pokazatelji performansi komunikacijskih projekata koji uključuju influencers.

Ključne reči: komunikacijski projekat, influencer marketing, digitalni kanali komunikacije, efektivnost kampanje, brend komunikacija

Abstract: Due to the expansion of influencer marketing as a distinct field of digital marketing, there is a pronounced need for defining a theoretical framework that formalizes the process of commercial collaboration with influential individuals in the online environment. This framework would enable a qualitative analysis of effectiveness and quantification of results within this process. Influencer marketing campaigns, in terms of their structure, processes, duration, and resource management, should be planned and executed as communication projects. This study presents the project management phases of influencer marketing, through the identification and analysis of key activities that determine its effectiveness. By conducting in-depth interviews with marketing experts and managers, representatives of companies and agencies who have collaborated with influencers in the execution of communication projects over an extended period, we have determined specific criteria for influencer selection, content and message design and management, challenges in communication project management, and key performance indicators for communication projects involving influencers.

Keywords: communication project, influencer marketing, digital communication channels, campaign effectiveness, brand communication

1. UVOD

Način promocije brendova menjao se paralelno sa razvojem digitalnih kanala komunikacije. Kao posledica intenzivnog razvoja digitalnih medija, nastaju novi oblici oglašavanja na internetu. Danas na donošenje odluka potrošača značajniji efekat ima sadržaj plasiran od strane pojedinaca koji imaju neki oblik uticaja u onlajn okruženju, naspram poruka koje kompanije plasiraju o svojim brendovima putem sopstvenih kanala komunikacije (Kostić-Stanković i dr., 2020). Formalizacijom i eksploatacijom navedenog uticaja digitalni marketing proširen je za još jednu kategoriju - influencer marketing (Santiago & Castelo, 2020).

Kao posrednici između brendova i potrošača javljaju se influenceri, koji menjaju način na koji kompanije kreiraju strategije komunikacije. Kako su influenceri ti sa kojima se potrošači poistovećuju (Harrigan i dr., 2021), angažovanje istih unapredilo je efikasnost komunikacijskih projekata kompanija. Proces izbora influensera za saradnju sa određenim brendom kompleksan je zadatak koji zahteva praćenje i analiziranje mnogih parametara, kako bi se napravio idealan spoj brenda i uticajne ličnosti. Takođe, ostali koraci u planiranju i implementaciji komunikacijske kampanje koja uključuje influencers, zahtevaju sistemski pristup, koji obuhvata sve faze upravljanja projektima kako bi se na efektivan i efikasan način realizovao ovaj proces.

Nakon uvoda u temu rada, dat je pregled dosadašnjih istraživanja na temu komunikacijskih projekata u influencer marketingu, sa fokusom na različite kategorizacije influensera, značaj influensera za komunikacijske projekte brendova, kao i koracima procesa influencer marketinga. U narednom poglavlju predstavljeno je istraživanje sprovedeno metodom dubinskih intervjua, sa prikazom rezultata. U poslednjem poglavlju navedeni su potencijalni pravci daljeg istraživanja i predstavljen je zaključak o temi.

2. KOMUNIKACIJSKI PROJEKTI U INFLUENSER MARKETINGU

Komunikaciju brenda moguće je definisati kao sposobnost brenda da slanjem željene poruke stvori poverenje potrošača (Ramadhani & Ruswanti, 2020). Koncept marketinških komunikacija menja se paralelno sa razvojem informaciono komunikacionih tehnologija, što dovodi do većeg nivoa složenosti i izazova kada je reč o kreiranju strategije komunikacije. Brza evolucija platformi i aplikacija na internetu stvorila je nove mogućnosti, kako za potrošače tako i za oglašivače. Pored mogućnosti komunikacije bez granica i traženja informacija u realnom vremenu, danas potrošači imaju mogućnost da svoje misli i osećanja izraze i razmene putem društvenih medija. Razvoj informaciono komunikacionih tehnologija omogućio je i pojavu novih hobija i profesija. Jedno od savremenih zanimanja nastalih usled brzog razvoja društvenih medija je influencer (Tsimonis & Dimitriadis, 2014). Influenceri se mogu definisati kao aktivni korisnici društvenih mreža, na kojima su ostvarili visok nivo popularnosti. Svojim objavama, digitalni influenceri izazivaju pozitivne reakcije kod pratilaca, zbog čega se smatraju liderima mišljenja (Kostić – Stanković i dr., 2020).

Usled neprestanog rasta broja korisnika društvenih medija (Statista, 2023), oni postaju dominantna komunikaciona platforma. Kao jedan od preciznijih kriterijuma za utvrđivanje efektivnosti određenog medija u marketinškoj komunikaciji koristi se indeks uključenosti (eng. *media engagement*). Interaktivna priroda digitalnih medija unapredila je razmenu informacija i proaktivnu komunikaciju između brendova i potrošača. Komunikacijski projekti bazirani na primeni društvenih medija brendovima pružaju mogućnost za uspostavljanje

odnosa sa postojećim i novim potrošačima, kao i formiranje zajednica koje interaktivno sarađuju, sa ciljem identifikovanja problema i kreiranja rešenja za iste (Tsimonis & Dimitriadis, 2014).

2.1. KONCEPT INFLUENSER MARKETINGA

Sa porastom zastupljenosti influensera u komunikacionim kampanjama kompanija i brendova, razvila se nova marketinška praksa i predmet izučavanja teoretičara i istraživača – influencer marketing (Biaudet, 2017). Proces influencer marketinga odnosi se na se identifikovanje i selekciju digitalnih influensera sa ciljem promocije proizvoda i/ili usluga kroz aktivnosti na društvenim mrežama i uticaja na potencijalne potrošače (UKEssays, 2018). Iako se influencer marketing ne smatra novim konceptom, imajući u vidu da se u marketinškoj komunikaciji oduvek koristi tzv. “identifikaciona ličnost” (Kostić-Stanković i dr., 2017), njegov razvoj praćen je ekspanzijom društvenih mreža čijom je upotrebom omogućen brži uticaj digitalnih influensera (Cicvarić Kostić & Štavljanin, 2020). Evolucija interneta omogućila je digitalnim influencerima neograničen broj pratilaca i veće šanse za unapređenje komunikacijskih projekata u odnosu na tradicionalne lidere mišljenja.

U praksi je zastupljeno nekoliko načina klasifikacije influensera, među kojima se ističe klasifikacija na osnovu broja pratilaca koji influenceri imaju na svojim kanalima komunikacije. Prema ovom kriterijumu, influenceri se mogu klasifikovati na sledeći način (Vodak i dr., 2019): nano influenceri (do 10.000 pratilaca), mikro influenceri (između 10.000 i 100.000 pratilaca), makro influenceri (između 100.000 i milion pratilaca) i mega influenceri (preko milion pratilaca).

Takođe značajan kriterijum za klasifikaciju influensera predstavljaju i oblasti u kojima su influenceri aktivni, odnosno uticajni. Izveštaj kompanije Emplifi (2023) navodi sledeće oblasti kao najdominantnije za influencers: muzika i umetnost, lepota, moda, pisanje, hrana, putovanje, kozmetika, porodica i majčinstvo.

2.2. UPRAVLJANJE KOMUNIKACIJSKIM PROJEKTOM U INFLUENSER MARKETINGU

Sistem upravljanja komunikacijskim kampanjama podrazumeva kreiranje plana komunikacije, čime se smanjuje rizik od odstupanja, optimizuje proces interakcije i snižavaju nepotrebni troškovi (Zozulya i dr., 2021). Kako projekat podrazumeva privremeni poduhvat, vremenski i troškovno ograničen i usmeren ka ostvarenju određenog cilja (Jovanović, 2006), influencer marketing kampanje po svojoj strukturi, procesu i načinu upravljanja resursima predstavljaju komunikacijske projekte usmerene na identifikaciju, razumevanje i angažovanje uticajnih ličnosti kroz nekoliko faza. Kako bi se unapredila efektivnost projekata, od suštinske je važnosti pristupiti upravljanju projektima na strukturisan način (Project Management Institute, 2013). Angažovanje svih relevantnih stejkholdera prepoznato je kao jedna od ključnih funkcija upravljanja projektima (Turner, 2014). Početni korak ovog procesa podrazumeva identifikaciju zainteresovanih strana, njihovih interesa i očekivanih reakcija (Müller & Turner, 2010). Shodno tome i projekat influencer marketinga započinje identifikacijom, analizom i selekcijom, sa jedne strane ciljnih grupa potrošača, a sa druge strane adekvatnih influensera, odnosno uticajnih ličnosti na društvenim mrežama, koje je moguće angažovati u kampanji. U tabeli 1 prikazane su faze procesa upravljanja projektom (Jovanović, 2006), kao i konkretne aktivnosti projekta influencer marketinga koje se sprovode u okviru svake faze.

Tabela 1. Aktivnosti projekta influencer marketinga u odnosu na faze upravljanja projektom

Faze upravljanja projektom	Aktivnosti projekta influencer marketinga
Iniciranje	• Analiza okruženja i istraživanje tržišta • Definisanje cilja projekta • Definisanje uloge influensera u projektu • Formiranje projektnog tima
Planiranje	• Segmentacija i izbor ciljnih grupa • Definisanje ključnih poruka • Izbor kanala komunikacije • Izbor influensera • Definisanje budžeta • Definisanje plana aktivnosti, vremenskih ograničenja i dinamike • Utvrđivanje očekivanih rezultata i merljivih metrika uspeha
Izvođenje	• Produkcija komunikacionog materijala • Plasiranje sadržaja na društvenim mrežama • Koordinacija tokom izvođenja projekta
Praćenje	• Praćenje angažmana i reakcije ciljne grupe na plasirani sadržaj • Analiza definisanih parametara i merenje postignutih ciljeva projekta • Identifikovanje potencijalnih mogućnosti za unapređenje rezultata projekta
Zatvaranje	• Evaluacija celokupnog uspeha projekta influencer marketinga • Izrada izveštaja o postignutim rezultatima • Odluka o nastavku ili prekidu saradnje sa influencerom

Definisanje jasnih i merljivih ciljeva predstavlja osnovu za dalje donošenje odluka o projektu, poput izbora influensera i definisanja njihove uloge u projektu, izbora ciljne grupe kojoj se određena poruka šalje, definisanja budžeta i slično (Santiago & Castelo, 2020). Marketing planerima je na raspolaganju i kvantitativna metodologija koju je moguće primeniti prilikom izbora adekvatnog influensera. To najčešće podrazumeva korišćenje određenih indeksa, koji pokazuju odnos između sastava auditorijuma nekog medija i ciljne grupe oglašivača. Jedan od njih je i indeks afiniteta, koji je u tradicionalnom oglašavanju pokazivao odnos rejtinga za konkretnu ciljnu grupu i rejtinga za ukupnu populaciju (Vlastelica, 2007). Prilagođeno metrici digitalnih komunikacija, indeks afiniteta za influensere pokazuje koliki procenat pratilaca konkretnog influensera se preklapa sa ciljnom grupom brenda.

Projektni tim formiran u početnoj fazi upravljanja projektom, zadužen je za kreiranje adekvatnog mehanizma motivacije i nagrađivanja digitalnih influensera sa ciljem postizanja optimalnih rezultata (Turner, 2014). Prema Emplifi izveštaju (2023) preferirani način kompenzacije od strane influensera je na prvom mestu novčani honorar, zatim poklon kartice ili vaučeri za kupovinu, besplatni proizvodi, popusti i na kraju mogućnost za deljenje sadržaja influensera na zvaničnim kanalima brenda, što podiže vidljivost i popularnost influensera.

Praćenje rezultata i merenje povraćaja ulaganja (ROI) od velike je važnosti kako za evaluaciju samog projekta, tako i za planiranje budućih kampanja. Izbor adekvatne metodologije i parametara za merenje uspešnosti zavisi od definisanog cilja projekta. Ukoliko je cilj podrazumevao povećanje svesti o brendu, tada je relevantan pokazatelj domet (eng. *Reach*), odnosno broj ljudi do kojih je sadržaj stigao. Sa druge strane, ukoliko je cilj saradnje

sa influencerima bio povećanje onlajn prodaje, jedan od načina merenja efekata je praćenje i upoređivanje broja poseta veb prodavnice i ostvarene kupovine, putem linkova generisanih od strane influensera.

3. ISTRAŽIVANJE PROCESA I EFEKTIVNOSTI SARADNJE SA INFLUENSERIMA

3.1. METODOLOGIJA ISTRAŽIVANJA

Pregledom literature i analizom dosadašnjih istraživanja u oblasti komunikacijskih projekata i saradnje sa influencerima, utvrđeno je da na domaćem tržištu ne postoje relevantni podaci niti usvojen teorijski i metodološki okvir upravljanja projektima koji uključuju influensere, kao ni uvid u rezultate koje kompanije i brendovi ostvare kroz tu saradnju. Kako se radi o specifičnoj vrsti projekata, prikupljanje relevantnih i validnih podataka za dalju analizu se može obaviti isključivo ispitivanjem pojedinaca koji poseduju adekvatnu ekspertizu, iskustvo u ovoj oblasti, kao i određeni senioritet u organizacionoj hijerarhiji. Stoga je za istraživački metod odabran dubinski intervju. Dubinski intervju jedna je od kvalitativnih metoda istraživanja primenom koje se spoznaju informacije o dubljim razlozima i motivacijama ispitanika u okviru definisane teme (Meler, 2005). Ova metoda istraživanja omogućava dublje razumevanje misli i ličnih stavova ispitanika (Halmi, 2013).

Istraživanje je realizovano u okviru programa master studija na Fakultetu organizacionih nauka i obuhvatilo je deset dubinskih intervju sa stručnjacima i menadžerima iz oblasti marketinga, koji duži vremenski period u realizaciji komunikacijskih projekata sarađuju sa influencerima, na promotivnim aktivnostima određenog brenda (Maričić, 2022). Intervjui su realizovani 2022. godine uz informisanu saglasnost rukovodilaca kompanija i agencija čiji predstavnici su učestvovali u istraživanju. Pet ispitanika su bili marketing menadžeri iz korporativnog sektora, odnosno kompanija koje su direktno angažovale influensere za svoje brendove iz industrije nameštaja i kućnih aparata, kozmetičkih preparata, hotelske industrije, alkoholnih i bezalkoholnih pića. Drugih pet ispitanika bili su predstavnici marketinških agencija, koje su u ime klijenata iz različitih industrija i za promociju različitih kategorija brendova, angažovale influensere u komunikacijskim projektima.

Dubinski intervjui su obuhvatili sledeća pitanja:

- Koji je cilj saradnje sa influencerom na određenom komunikacijskom projektu?
- Koji kriterijumi se koriste za izbor konkretnog influensera – saradnika na komunikacijskom projektu?
- Koliko je trajanje komunikacijskih projekata koji obuhvataju saradnju sa influencerima?
- Na koji način se upravlja sadržajem i formatom poruka koje plasiraju influenceri o brendu?
- Koji su najčešći izazovi u upravljanju projektom saradnje sa influencerima u promociji brenda?
- Koji su ključni pokazatelji performansi (KPIs) komunikacijskih projekata koji uključuju influensere, odnosno na koji način se meri efikasnost i efektivnost saradnje sa influencerima?

3.2. REZULTATI I DISKUSIJA

Kao najzastupljeniji cilj saradnje sa influencerima na komunikacijskim projektima ispitanici su isticali podizanje svesti o brendu, angažovanjem većeg broja influensera koji pripadaju različitim kategorijama prema broju pratilaca, ili angažovanje influensera da direktno utiču na

porast onlajn prodaje proizvoda ili usluga. Takođe, influenseri se navode kao neizostavni učesnici komunikacijskih projekata kojima se lansira novi proizvod ili se promoviše događaj u bliskoj budućnosti, sa pozivom za publiku.

Osnovni kriterijum koji se koristi prilikom izbora influensera sa kojim će se sarađivati na komunikacijskom projektu je procenat preklapanja ciljne grupe brenda i ciljne grupe influensera (eng. *affinity index*), zatim usklađenost vrednosti koje promoviše influencer i ključnih vrednosti brenda, kao i sadržaja, formata i tona komunikacije, koji mogu da pokažu da su influencer i brend kompatibilni. Kada je u pitanju saradnja sa konkurentskim brendovima, ispitanici su isticali da ne biraju influensere koji su sarađivali sa konkurentskim brendovima. Marketing menadžer koji dolazi iz hotelske industrije je jedini koji se izjasnio da su saradnje influensera sa konkurentskim brendovima neizbežne, s obzirom da tzv. *travel* influenseri često kombinuju više destinacija tokom jednog putovanja.

Kada je reč o sadržaju koji influenseri objavljuju, marketing menadžeri su istakli da redovno daju detaljne smernice influencerima, ali samo kako bi oni razumeli bolje poruku koju treba da prenesu. Iako finalno budu zadovoljni sadržajem koji influenseri kreiraju za potrebe promocije brenda, često se nezadovoljstvo javlja sa sadržajem koji influencer plasira kroz svoje druge objave na profilu, koje nisu u vezi sa brendom, u periodu trajanja komunikacijskog projekta. Do sada, marketing menadžeri nisu ugovorom definisali kakav konkretno sadržaj influencer treba da izbegava ili ne sme da objavljuje tokom perioda saradnje.

Angažman influensera u komunikacijskim projektima se reguliše ugovorom o saradnji. Trajanje projekata je načešće mesec dana, dok su najduži ugovori trajali do jedne godine. Kao najčešći izazovi koji se javljaju u komunikacijskim projektima koji uključuju influensere, ispitanici su istakli saradnju influensera sa konkurentskim brendovima u kategoriji, nakon što se projekat završi. Dodatno, na proces i ishod projekata često utiče i neažurnost u komunikaciji, odnosno zakasneli odgovori i reakcije influensera na inicijative od strane marketing menadžera.

Pokazatelji uspešnosti i merenje efektivnosti komunikacijskih projekata zavisi od definisanog cilja saradnje sa influencerom. U slučaju povećanja prodaje kao krajnjeg cilja, u praksi se pokazalo da je kreiranje, a zatim i praćenje promo kodova ili generisanje posebnih prodajnih linkova za influensere, najbolji pokazatelj koliki je povrat investicije od saradnje sa influencerom, izražen kroz udeo u ukupnoj prodaji ili kao odnos uloženi sredstava u ovaj komunikacijski projekat i ostvarene prodaje. U slučaju saradnje koja za cilj ima podizanje svesti o brendu, mere se pokazatelji kao što su doseg (*Reach*), interakcije (*Engagement*) ili pridobijeni pratioci.

4. ZAKLJUČAK

Razvojem digitalnog marketinga započete su revolucionarne promene u načinu komunikacije brendova sa potrošačima. Koncept influencer marketinga nastao je kao posledica razvoja digitalnih medija, čime su kompanije dobile priliku da utiču na stavove, izbore i ponašanje potrošača, koji dobrovoljno, svesno i uključeno prate određene ličnosti na društvenim medijima. Kampanje influencer marketinga prema svojoj strukturi, trajanju, načinu organizacije i evaluacije, predstavljaju projekte čija efektivnost zavisi od stepena primene sistemskog upravljanja. Aktivnosti projekata influencer marketinga je moguće sistematizovati i sukcesivno realizovati prema fazama upravljanja projektima, među kojima se posebno izdavaća značaj adekvatnog izbora projektnog tima, odnosno ključnog saradnika –

influensera. To podrazumeva kvalitativno istraživanje da li se vrednosti influensera podudaraju sa vrednostima brenda, kao i analizu atraktivnosti i adekvatnosti sadržaja, formata i tona komunikacije u odnosu na očekivanja ciljne grupe brenda. Rezultati istraživanja su pokazali da je za efektivnu realizaciju projekta influencer marketinga od izuzetnog značaja jasno definisanje cilja projekta i praćenje ostvarenih rezultata, tokom i po završetku projekta. Takođe, utvrđeno je da saradnja influensera sa konkurentnim kompanijama može biti eliminatorni kriterijum, osim kada je to neizbežno i kada se promocijom čitave kategorije usluga promoviše i konkretan brend, kao što je slučaj sa turizmom i hotelijerstvom.

Osnovno ograničenje istraživanja predstavlja mali uzorak, koji je karakterističan za metod dubinskog intervjua. U budućim istraživanjima bi mogao da se primeni metod ankete, sa većim uzorkom i mogućnošću generalizacije i poređenja rezultata između određenih industrija, kategorije proizvoda ili usluga, kao i oblasti u kojima su influenceri aktivni.

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POŽELJNE OSOBINE I ZNANJA LIDERA

DESIRABLE CHARACTERISTICS AND KNOWLEDGE OF A LEADER

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Apstrakt: Pored menadžerskih, od rukovodioca se zahtevaju i liderske sposobnosti, u pogledu svojih razmišljanja i postupanja. Liderstvo je proces u kome pojedinac – lider ostvaruje uticaj na grupu, u pogledu postavljanja ciljeva, standarda i prioriteta. Lider treba na osnovu analize situacije i sposobnosti sledbenika (kompetentnost i posvećenost), da odabere adekvatan stil liderstva, kako bi definisao i ostvario ciljeve organizacije u datom trenutku. Od strane lidera se očekuje da imaju određene osobine i da raspolažu potrebnim znanjima, što ih kvalifikuje za lidersku poziciju u pogledu formulisanja strategije kao i definisanja i primene misije pri realizaciji planskih poslova iz nadležnosti organizacije. U ovom radu, dat je prikaz poželjnih osobina i znanja lidera, viđen iz ugla studenata završnih godina Osnovnih i Master akademskih studija na Fakultetu za projektni i inovacioni menadžment u Beogradu. Istraživanjem je obuhvaćen uzorak od dvesta osamdeset sedam studenata, koji su po svom mišljenju, rangirali poželjne osobine, kao i oblasti poželjnih znanja lidera. Nakon obrade rezultata, došlo se do zaključka o rangi poželjnijih osobina i znanja lidera.

Ključne reči: Lider, menadžer, liderstvo, situaciono liderstvo, osobine lidera, znanja lidera.

Abstract: In addition to managerial skills, leaders are also required to have leadership skills in terms of their thinking and actions. Leadership is a process in which an individual - leader exerts influence on a group, in terms of setting goals, standards and priorities. Based on the analysis of the situation and the abilities of the followers (competence and commitment), the leader should choose an adequate leadership style in order to define and achieve the goals of the organization at a given moment. Leaders are expected to have certain qualities and to have the necessary knowledge, which qualifies them for a leadership position in terms of formulating a strategy as well as defining and implementing the mission in the implementation of planned tasks within the organization's jurisdiction. In this paper, an overview of the desirable qualities and knowledge of a leader is given, seen from the point of view of students in the final years of Basic and Master academic studies at the Faculty of Project and Innovation Management in Belgrade. The research included a sample of two hundred and eighty-seven students, who, in their opinion, ranked the desirable qualities and areas of desirable knowledge of leaders. After processing the results, a conclusion was reached on the ranking of the most desirable qualities and knowledge of leaders.

Keywords: Leader, manager, leadership, situational leadership, leader's qualities, leader's knowledge.

1. UVOD

Od rukovodioca se zahtevaju i liderske i menadžerske sposobnosti, razmišljanja i postupanja. Lider određuje IDEJU (šta raditi), definiše i razume misiju organizacije i formuliše strategiju za primenu misije. Postavlja ciljeve, standarde i prioritete. Za razliku od lidera, menadžer operacionalizuje ideje, primenjuje definisanu strategiju organizacije i sprovodi programe koji se odnose na organizaciju i realizaciju posla na oživotvorenju ideje.

Menadžer na čelu neke organizacije je centralna figura u upravljanju tom organizacijom. On organizuje, usmerava, koordinira, integriše rad svih zaposlenih u organizaciji, rešava probleme i konflikte, i daje zadatke, sve u cilju efikasnog postizanja strateških ciljeva organizacije (Čabarkapa & dr., 2022).

Liderstvo je dvosmeran proces između lidera i grupe ljudi koju vodi – sledbenika, sa ciljem ostvarivanja postavljenih ciljeva. Lider pomaže u dostizanju ciljeva, gde na osnovu analize situacije i sposobnosti sledbenika odabira adekvatan stil liderstva.

Dok menadžer u svom radu i ponašanju, svoju energiju usmerava na: sprovođenje, kopiju poznatog, podržavanje, fokus na sisteme, kontrolisanje, ograničen vidik i podržava; lider svoju energiju usmetrava na: inoviranje, original, razvijanje, fokus na ljude, poverenje, širok vidik, pokretanje. Dok je menadžer dobar vojniki, koji vodi računa o tome kako i kad nešto uraditi; lider mora da bude general – strateg, koj vodi računa o svemu kao i šta i zašto uraditi.

Imajući u vidu napred navedene razlike u radu i ponašanju između lidera i menadžera, i od jednih i drugih se očekuje da poseduju određene kompetencije (stavovi, osobine, znanja, veštine, psihička kvalifikovanost i dr.) kako bi, svako na svoj način odgovorio izazovima, koji se pred njima postavljaju. Naravno, zahtevane kompetencije treba još više da dođu do izražaja u posebnim uslovima, kao npr. kriznim situacijama (Čabarkapa & dr., 2022).

Svaki lider treba da poseduje potrebne elemente, sa posebnim fokusom na njegovu ulogu u postizanju poslovne izvrsnosti unutar organizacije (Punoševac, 2013).

2. POŽELJNE KARAKTERISTIKE LIDERA

Od menadžera se, pored osnovnih odlika (održava propisano, kontroliše, radi dobro, ...), očekuje da u svom delovanju manifestuje i odlike lidera (razvija ljude, uliva poverenje, ide „ispred događaja“). Menadžer treba da poseduje određene sposobnosti i znanja, kako bi mogao uspešno da obavlja sve funkcije menadžmenta. Za svakog menadžera je poželjno da poseduje liderske sposobnosti.

Podrazumeva se da je menadžer na strateškom nivou kompetentan da postavlja smernice za postizanje ciljeva, tj. da uspešno provodi vrlo zahtevnu funkciju strateškog planiranja koja zahteva mnogo različitih resursa kako bi se stvorila održiva strategija za budućnost organizacije (Bošnjak, 2019).

Menadžer sa svojim sposobnostima treba uspešno da provodi proces strateškog upravljanja u posebnim i specifičnim organizacijama gde se podrazumeva širi kontekst posmatranja, uzimajući u obzir uticaj promena iz okruženja. Neophodna je potreba za integrisanim konceptom strateškog upravljanja u ovim organizacijama sa ciljem stvaranja novih ideja, podsticanja inovativnih procesa, prenosa i uspostavljanja novih tehnologija.

Savremeni ekonomski uslovi, koje karakterišu turbulentne promene, nameću potrebu za liderstvom kao sredstvom opstanka i organizacionog razvoja (Trajković & dr. 2010).

Smisao za strategiju je važan element u menadžmentu, a pod tim podrazumeva da se najviši menadžment slaže sa pravcem u kome se njihova organizacija pokušava fokusirati. Da bi ostvario ulogu upravljanja, pored posedovanja ličnih osobina, lider mora da ide u korak sa dinamikom razvoja savremenog društva. Liderstvo se zasniva na viziji kako preživeti i pobediti promene (Habić & Bulatović, 2016).

Od velikog broja karakteristika, kao veoma bitne za lidera, izdvajaju se: poželjne osobine, poželjna znanja, psihička kvalifikovanost i lični stavovi. U zavisnosti od trenutne situacije u kojoj se organizacija nalazi, lider treba da se prilagodi datoj situaciji, odabirom odgovarajućeg stila „situacionog liderstva“.

2.1 POŽELJNE OSOBINE LIDERA

Od lidera, bez obzira gde se on nalazi u hijerarhijskoj strukturi neke organizacije, se očekuje da ispolji svoje osobine, koje će doprineti uspešnom izvršavanju utvrđenih zadataka i ostvarenju postavljenih strateških ciljeva date organizacije. Postavlja se pitanje koje su to osobine? Delimičan odgovor na ovo pitanje, pokušali smo da dobijemo kroz realizovano istraživanje sa budućim menadžerima, studentima završnih godina Osnovnih i Master studija na Fakultetu za projektni i inovacioni menadžment “Prof. dr Petar Jovanović” u Beogradu. Istraživanje je realizovano na uzorku od dvesta osamdeset sedam studenata. Njihov zadatak je bio da rangiraju deset poželjnih osobina lidera, tako da na prvo mesto stave najpoželjniju osobinu, odnosno osobinu za koju smatraju da bi trebala da ima najveći izraženi intenzitet i tako redom do desete. Važno je napomenuti da im nisu bile ponuđene unapred definisane osobine, koje bi samo rangirali, već su ih navodili po svom mišljenju. Slično istraživanje, na istom uzorku ispitanika realizovano je i za poželjne karakteristike menadžera za upravljanje u kriznim situacijama (Čabarkapa & dr., 2022).

Nakon prikupljenih i obrađenih podataka, na osnovu pojedinačno iskazanih rangiranja dobijen je konačan rang poželjnih osobina lidera, prikazanih u tabeli br. 1. U delu tabele koji se odnosi na poziciju – pojedinačni rang, uneti su podaci o rangiranim osobinama iskazanim od strane ispitanika (studenata). Što je veća pozicija, to je rang veći (pozicija 1, dakle prvo mesto, nosi rang 10, itd.). U drugom delu tabele dati su podaci koji se odnose na matematičku obradu dobijenih rezultata ($\sum f_i$, x_{fi} , Prosek), gde su na kraju rangirane poželjne osobine.

Na osnovu konačnog ranga, da se zaključiti da su kod lidera najpoželjnije sledeće osobine: na prvom mestu da je vizionar; na drugom i trećem sa istim rangom, da je jaka i stabilna ličnost i da poseduje samopouzdanje; potom da je dobar komunikator; da poseduje harizmu; da je inovativan. Zatim slede osobine kod kojih se konačan rang malo razlikuje (sposobnost da inspiriše i podstiče; fleksibilnost; neustrašivost; organizacione sposobnosti; empatičnost; predan poslu; visoka inteligencija; da preuzima odgovornost; kreativnost), sve su u rasponu proseka od 5,62 do 5,28. I na kraju su rangirane one osobine koje su sa manjim ukupnim prosekom, i to: entuzijasta; etičnost i pozitivan stav.

Tabela 1. Prikaz podataka sa rangom poželjnih osobina lidera

R br.	OSOBINA	Pozicija – pojedinačni rang										$\sum f_i$	x _{fi}	Prosek	Rang
		1	2	3	4	5	6	7	8	9	10				
		10	9	8	7	6	5	4	3	2	1				
1	Jaka i stabilna ličnost	17	13	11	14	13	14	12	0	11	12	117	703	6,01	2-3
2	Neustrašivost	13	14	12	13	13	0	0	12	15	17	109	604	5,54	9
3	Samopouzdanje	13	14	16	12	12	12	12	15	14	0	120	721	6,01	2-3
4	Dobar komunikator	18	17	15	13	15	14	12	11	11	13	139	820	5,90	4
5	Inovativnost	11	12	15	12	17	12	18	14	0	12	123	710	5,77	6
6	Fleksibilnost	0	11	11	11	11	15	12	0	0	12	83	465	5,60	8
7	Sposobnost da inspiriše i podstiče	15	13	15	13	12	13	14	13	12	13	133	747	5,62	7
8	Da preuzima	13	11	14	12	15	20	16	14	16	14	145	767	5,29	14

	odgovornost														
9	Empatičnost	11	0	15	13	11	11	12	12	19	0	104	564	5,42	11
10	Kreativnost	12	17	11	13	14	11	11	13	15	20	137	724	5,28	15
11	Harizma	15	14	13	0	11	14	15	12	0	13	107	625	5,84	5
12	Etičnost	0	11	0	14	13	11	12	0	11	13	85	413	4,86	17
13	Pozitivan stav	0	11	11	11	0	11	12	15	13	11	95	449	4,73	18
14	Organizacione sposobnosti	12	12	0	13	11	14	0	13	11	11	97	527	5,43	10
15	Predan poslu	11	11	13	12	0	12	15	11	11	12	108	584	5,41	12
16	Vizionar	15	14	11	17	16	12	12	0	12	11	120	722	6,02	1
17	Visoka inteligencija	11	15	0	12	11	0	12	12	12	11	96	514	5,35	13
18	Entuzijasta	11	0	12	11	11	0	0	15	12	12	84	430	5,12	16

2.2 POŽELJNA ZNANJA LIDERA

Od lidera se zahtevaju znanja koja su potrebna svakom rukovodiocu ali i posebna znanja koja su specifična za vođenje konkretne organizacije. Organizacijom može da rukovodi ličnost koja nije samo stručnjak, odnosno specijalista u određenoj oblasti, već ličnost koja poseduje i viši stepen znanja i iskustva. Rukovoditi nekom organizacijom znači neposredno učestvovati i celovitije poznavati problematiku koja se rešava. Posebno je važno da ova znanja poseduje lider. U teoriji i praksi upravljanja prisutni su brojni različiti pristupi klasifikaciji znanja koja treba da poseduje lider (Andrejić & Čabarkapa, 2021).

Kao što lider treba da poseduje određene osobine, tako bi trebalo da poseduje i znanja iz određenih oblasti, neophodna za ostvarivanje planiranih strateških ciljeva organizacije. Postavlja se pitanje koja su to znanja? Delimičan odgovor na ovo pitanje, pokušali smo da dobijemo, kroz realizovano istraživanje sa istim uzorkom, kao i za poželjne osobine lidera. Dakle, zadatak je bio da po svom mišljenju, rangiraju deset poželjnih znanja lidera, tako da na prvo mesto stave najpoželjnija znanja iz određene oblasti, i tako redom do desete. Takođe, nisu im bila ponuđene oblasti znanja, koje bi samo rangirali, već su po svom mišljenju, navodili poželjne oblasti znanja.

Nakon prikupljenih i obrađenih podataka, na osnovu pojedinačno iskazanih rangiranja dobijen je konačan rang poželjnih znanja lidera, prikazanih u tabeli br. 2. U delu tabele koji se odnosi na poziciju – pojedinačni rang, uneti su podaci o rangiranim oblastima znanja iskazanim od strane ispitanika (studenata). U drugom delu tabele dati su podaci koji se odnose na matematičku obradu dobijenih rezultata ($\sum f_i$, x_{fi} , Prosek), gde su na kraju rangirana poželjna znanja.

Tabela 2. Prikaz podataka sa rangom poželjnih znanja lidera

R br.	OBLAST ZNANJA	Pozicija – pojedinačni rang										$\sum f_i$	x_{fi}	Prosek	Rang
		1	2	3	4	5	6	7	8	9	10				
		10	9	8	7	6	5	4	3	2	1				
1	Organizacija	20	22	18	15	16	11	14	0	0	0	116	854	7,36	1
2	Ljudski resursi	25	24	14	14	0	12	0	11	13	11	124	806	6,50	2
3	Ekonomija	12	11	16	20	12	14	11	16	11	15	138	758	5,49	9
4	Tehnologije	15	12	17	14	13	13	13	13	12	14	136	764	5,62	4
5	Informatika	11	0	16	14	20	17	15	15	15	0	123	676	5,50	7

6	Administracija	0	11	11	15	18	17	0	12	14	15	113	564	4,99	10
7	Marketing	15	13	16	14	18	13	16	14	14	12	145	812	5,60	5
8	Uslužni servisi	12	11	0	0	0	19	14	12	18	14	100	456	4,56	14
9	Privreda	0	13	0	11	11	0	15	20	15	0	85	410	4,82	13
10	Tržišna konk.	0	12	13	14	13	14	15	15	14	15	125	606	4,85	12
11	Delov. tržišta	14	15	11	13	11	13	14	11	14	12	128	714	5,58	6
12	Zakonodavstvo	0	11	12	13	11	0	14	0	11	19	91	449	4,93	11
13	Zaštita IS	0	11	11	0	12	14	16	14	14	18	110	481	4,37	15
14	Psihologija	12	0	0	0	0	0	0	0	0	12	24	132	5,50	8
15	Pregovaranje	0	0	0	8	10	12	0	0	11	11	52	209	4,02	16
16	St. upravljanja	0	11	12	10	0	0	0	0	0	11	44	276	6,27	3

Na osnovu konačnog ranga, da se zaključiti da su kod lidera, sa veoma visokim rangom, najpoželjnije sledeće tri oblasti znanja: iz organizacije poslovanja, iz oblasti ljudskih resursa i iz strategije upravljanja. Zatim slede znanja iz pojedinih oblasti kod kojih se konačan rang malo razlikuje (primenjene tehnologije; marketinških tehnika; delovanja tržišta; poslovne informatike; psihologije; poslovne ekonomije; poslovne administracije; privrednog zakonodavstva; tržišne konkurencije; privrednog sistema i uslužnih servisa).

Takođe, da se primetiti da je jako mali broj ispitanika kao poželjna znanja lidera, naveo posedovanja znanja iz oblasti Zaštite intelektualne svojine, jer su u konačnom rangui tek na petnaestom mestu, dok su na poslednjem mestu potrebna znanja iz oblasti pregovaranja. Ovo ukazuje na činjenicu da je svest o potrebi zaštite intelektualne svojine na veoma niskom nivou, jer studenti nisu upoznati sa značajem posedovanja znanja iz ove oblasti. ***Visokorangirana poželjna osobina lidera da bude inovativan je u suprotnosti sa skoro zadnjorangiranim poželjnim znanjem iz oblasti Zaštite intelektualne svojine.*** Inovativan lider, svakako treba da zna put do realizacije svoje inovacije. Na određenom delu tog puta, on treba da zaštiti inovaciju – kao intelektualnu svojinu organizacije ili ličnu, čime pored ostvarivanja postavljenih ciljeva, direktno doprinosi povećanju njene vrednosti. O potrebi da se oblast zaštite intelektualne svojine izučava na svim nivoima studija a posebno na fakultetima gde se izučava oblast tehničko-tehnoloških nauka, ekonomskih i pravnih nauka u više navrata je predlagano u ranijem periodu (Čabarkapa, 2010).

3. ZAKLJUČAK

Poznato je, da bi se neko kvalifikovao za ulogu lidera, neophodno je da poseduje potrebne karakteristike. Od velikog broja karakteristika, kao veoma bitne izdvajaju se: psihička kvalifikovanost, mentalna stabilnost i snaga, lični stavovi, osobine i znanja. U zavisnosti od trenutne situacije u kojoj se organizacija nalazi, lider treba da se prilagodi datoj situaciji, odabirom odgovarajućeg stila „situacionog liderstva“. U svakom trenutku, lider treba da poznaje svoje sledbenike u pogledu njihovih kompetencija i posvećenosti i na osnovu kombinacije ovih karakteristika da primeni adekvatan stil liderstva. U ovakvim situacijama, do posebnog izražaja treba da dođu njegove osobine i znanja.

Postavilo se pitanje: Koje su to poželjne osobine i znanja koje treba da poseduje neko lice, da bi bio kvalifikovan za lidersku poziciju u organizaciji? Da bi se došlo do odgovora na ovo pitanje, realizovano je istraživanje na uzorku od dvesto osamdeset sedam studenata, koji se školuju za buduće menadžere. Došlo se do sledećih zaključaka:

1) Kao najpoželjnije osobine lider bi trebao da: bude vizionar, je jaka i stabilna ličnost, poseduje samopouzdanje, je dobar komunikator, poseduje harizmu, je inovativan;

- 2) Kao najpoželjnija znanja, lider bi trebao da poseduje znanja iz sledećih oblasti: organizacije poslovanja, ljudskih resursa i strategije upravljanja;
 - 3) Na skoro poslednjem mestu su se našla poželjna znanja iz oblasti Zaštite intelektualne svojine, što ukazuje da studenti, budući menadžeri ne poseduju svest na potrebnom nivou o značaju ove oblasti.
 - 4) Visokorangirana poželjna osobina lidera da bude inovativan je u suprotnosti sa skoro zadnjerangiranim poželjnim znanjem iz oblasti Zaštite intelektualne svojine.
- Iako nije bio primarni cilj, do koga se trebalo doći ovim istraživanjem, kao dodatni zaključak nameće se potreba da na svim nivoima studija treba razmotriti potrebu da se u određenoj formi izučava oblast "Zaštite intelektualne svojine".

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UPRAVLJANJE LJUDSKIM RESURSIMA U PROJEKTNOM OKRUŽENJU: ULOGE NA PROJEKTU KOJE IMAJU TENDENCIJU DA NESTANU

HUMAN RESOURCE MANAGEMENT IN A PROJECT ENVIRONMENT: ROLES ON PROJECT THAT TEND TO DISAPPEAR

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Apstrakt: U današnjem brzorastućem svetu, poznavanje uloga ljudskih resursa u projektima igra ključnu ulogu u projektno orijentisanim organizacijama. Promene u ulogama tokom vremena ukazuju na to da će neke nove uloge postati standardne, dok će druge možda nestati. Razumevanje zadataka i sticanje osnovnih znanja i veština na radnom mestu pomaže zaposlenima da se integrišu u projektni tim. Razumevanje uloga u organizaciji, bez obzira na to da li je orijentisana ka projektima, programima ili portfolijima, zahteva odgovarajuće veštine i prilagođavanje neizvesnom okruženju. Rekrutacija ima ključnu ulogu u pronalaženju pravih kandidata, a menadžeri projekata treba da razumeju osnovne kompetencije i podrže razvoj svojih zaposlenih. Ako je osoba na odgovarajućoj poziciji, doprineće sinergetskom efektu u projektno orijentisanoj organizaciji. Ovaj rad će obuhvatiti različite uloge ljudskih resursa, važne aspekte radnih mesta, mapiranje radnih mesta i uloge koje se menjaju tokom vremena.

Ključne reči: Ljudski resursi, Projekat, projektno-orijentisana organizacija, uloge na projektu

Abstract: In today's fast-paced world, understanding the roles of human resources in projects plays a crucial role in project-oriented organizations. Changes in roles over time indicate that some new roles will become standard, while others may disappear. Understanding job tasks and acquiring basic knowledge and skills in the workplace helps employees integrate into the project team. Understanding roles within an organization, whether it is project-oriented, program-oriented, or portfolio-oriented, requires relevant skills and adaptation to an uncertain environment. Recruitment plays a key role in finding the right candidates, and project managers should understand core competencies and support the development of their employees. If a person is in the appropriate position, they will contribute to the synergistic effect in a project-oriented organization. This paper will cover various human resource roles, important aspects of job positions, job mapping, and the evolving roles over time.

Keywords Human resources, Project, project-oriented organization, roles in a project

1. UVOD

Sticanje znanja o raznim ulogama koje se pojavljuju na projektima, igra značajnu ulogu u razumevanju koncepta projektno orijentisane organizacije. Kako se uloge menjaju sa protokom vremena, može se zapaziti trend da postojanje nekih novih uloga danas, za par godina će ili nestati ili će biti standardne uloge koje se uzimaju kao a priori kada se priča o ulogama ljudskih resursa u projektno orijentisanoj organizaciji. Poznavanje zadataka i sticanje osnovnih znanja i veština o zadacima na radnom mestu, na kojem se zaposleni nalazi, povećava verovatnoću da će zaposleni na toj poziciji oseća prijatno i usvojeno od strane

projektnog tima. Razumevanje uloga u samoj organizaciji, bilo da je orijentacija organizacije ka projektima, programima ili portfolijima, podrazumeva određeni temelj u pogledu posjedovanja veština i tehnika za vođenje projekata, ključnih mehanizama upravljanja, posjedovanje adekvatnih alata i sposobnost prilagođavanja neizvesnom okruženju. Rekrutacija zaposlenih je ključni korak o ulogama ljudskih resursa u projektno orijentisanoj organizaciji, jer prvi kontakt ljudskih resursa sa potencijalnim kadrovima treba da bude od suštinskog značaja za dalji tok karijere projektnih menadžera. Osoba koja upravlja jednim timom, a ujedno i projektom, treba da razume i koristi osnovne kompetencije da bi projekat ispunio zacrtane ciljeve i da bi osnažio svoje zaposlene da napreduju u svojoj karijeri. Ako se na jednom radnom mestu nalazi kompetentna osoba koja u potpunosti odgovara profilu koje to radno mesto zahteva, velika je verovatnoća da će ta osoba da doprinosi sinergetskom efektu zajedno sa ostalim članovima svog tima u projektno orijentisanoj organizaciji.

2. KONCEPT UPRAVLJANJA LJUDSKIM RESURSIMA U PROJEKTNO ORIJENTISANOJ ORGANIZACIJI

Uzimajući u obzir zavisnost obima i veličine projekata, definisani zadaci moraju da budu temeljno analizirani kako bi se se definisale i uloge kako bi se zadaci realizovali i ispunili definisane ciljeve projektno orijentisane organizacije (Yarbrough, 2021). Iz tog razloga prekretnica za ulazak u organizaciju jeste selekcija i regrutacija adekvatnih zaposlenih koji će doprineti realizaciji postavljenih ciljeva. Upravljanje ljudskim resursima (HRM) se može posmatrati kao ključni proces projektne orijentisane organizacije koji utiče na način na koji organizacija stiče i koristi ljudske resurse i kako zaposleni doživljavaju radni odnos (Huemman, 2007).

Kao što u konceptu upravljanja projektima planiranje predstavlja ključnu fazu, tako i u konceptu upravljanja ljudskim resursima selekcija kadrova predstavlja prekretnicu za efikasnost u ispunjenju ciljeva. U procesu upravljanja projektima, pojavljuju se sledeće uloge: menadžerska uloga integratora, njegovo razumevanje procesa upravljanja projektima, prilagođavanje projekta sa okruženjem i obezbeđivanje istog (Kordova i dr., 2018).

Koncept upravljanja ljudskim resursima podrazumeva i odgovornost projektnog menadžera, ali sa druge strane i ispunjenje određenih zahteva koji podrazumevaju (Kordova i dr., 2018):

1. Performanse
2. Troškove
3. Vremenski raspored

Kako bi se koncept upravljanja projektima usaglasio sa konceptom upravljanja ljudskim resursima potrebno je da sva tri gorenavedena aspekta detaljno analiziraju. Složeni projekti nekada imaju potrebu za uključivanjem brojnih stručnjaka iz oblasti upravljanja projektima, pa je s tim u vezi, neophodno angažovati veliki broj ljudi različitih profila, sposobnosti i znanja, a angažovanje kadrova koji imaju navedene ekspertize angažuje sektor ljudskih resursa. Timovi koji rade na realizaciji projekta nekada strahuju od gubitka posla, jer su angažovani samo za potrebe projekata, a nakon završetka projekta, vraćaju se u svoju matičnu kompaniju ili radno mesto, ili prelaze na drugi projekat. Kako bi se smanjila ova nesigurnost, predlaže se potpisivanje unapred definisanog ugovora koji teži da ublaži nesigurnost angažovanja od projekta do projekta, tj. straha od gubitka posla ili takozvanog "nomadskog života".

U literaturi se navodi PMCD okvir za upravljanje projektima koji je usklađen i sponzorisan od strane Instituta za upravljanje projektima (PMI, 2017). Ovaj okvir je razvijen sa ciljem da pojedincima pruži određena uputstva o tome kako da procenjuju, planiraju, vode, organizuju

projekte. Glavna svrha PMCD okvira je da pruži menadžerima projekta, ali i sektoru ljudskih resursa, određene smernice i uputstva o kompetencijama zaposlenih koji:

- Imaju adekvatna znanja, veštine i sposobnosti iz oblasti upravljanja projektima;
- Poseduju i iskazuju kompetencije znanja iz oblasti upravljanja projektima tako što je nedavno položio odgovarajući test/ispit iz ove oblasti;
- Su u stanju da pruže dokaze o svojim ličnim kompetencijama koji se prepoznaju u međunarodno priznatim okvirima za upravljanje projektima.

2.1. ODGOVORNOST ZA UPRAVLJANJE PROJEKTIMA

Često se postavlja pitanje zbog čega su odgovornosti bitne u organizacijama i da li pravilnom upotrebom i razumevanjem kompetencija pojedinci mogu da unapređuju svoje veštine potrebne za obavljanje posla. Razumevanje i pravilna upotreba kompetencija su jedan od najznačajnijih koncepata u razvoju ljudskog potencijala, ali i omogućavanju sektoru ljudskih resursa da adekvatno mapiraju uloge sa radnim mestom. Kompetencije ne predstavljaju samo teorijski aspekt poslovanja, već i praktičnu primenu koja je u poslednjih nekoliko godina dobila na značaju u projektno orijentisanim organizacijama. Ljudski resursi su jedan od ključnih segmenata na projektu i važno je da se pravilno se i njima pravilno upravlja kako bi se postigao uspeh projekata. Ovo uključuje identifikaciju potrebnih uloga i odgovornosti, ali i ljudskih resursa za svaku ulogu, kako bi se adekvatno sprovela regrutacija, obuka, vođenje i motivisanje tima za ostvarivanje visokokvalitetnih performansi. Upravljanje ljudskim resursima podrazumeva sledeće tokove procesa prilagođeno prema Antoniu, 2010. *Prvi* i najznačajniji planiranje ljudskih resursa, što podrazumeva definisanje uloga i odgovornosti i identifikaciju potrebnih ljudskih kadrova za definisane radne uloge. *Druga* značajna stvar kada se govori o formiranju tima za projekat jeste regrutacija ljudskih resursa odnosno kadrova, traženje, odabir, grupisanje u odgovarajuće timove i mapiranje zaposlenih sa radnim mestom. *Treća* stvar jeste obuka i razvoj zaposlenih ili potencijalnih članova koji će činiti budući tim. Obuka i razvoj zaposlenih podrazumeva da ljudski resursi na projektu osiguraju potrebne obuke, da pronađu adekvatan kurs, trening, obuku ili sertifikaciono telo koje će usavršavati zaposlene. Sticanje osnovnih znanja i veština o budućem radu za svakog zaposlenog, jedna je od ključnih faza razvoja projektnog tima. Povraćaj novca koje kompanije ulažu u voje zaposleni moguće je kroz sistematski pristup razvoju i učenju u organizacionom okruženju. Sistemski pristup obuci se može predstaviti pomoću (Ivanković, 2019):

- Analize i procene učinka zaposlenih i/ili analize potreba za kompetencijama upotrebom okvira i standarda kompetencija.
- Planiranja i dizajniranja seta različitih razvojnih rešenja i metoda koje uključuju inovativne oblike učenja na radnom mestu.
- Programa učenja i razvojnih rešenja.
- Metodologije transfera obuke u realno radno okruženje.

Ključna stvar za razvoj tima jeste upravljanje timom, što podrazumeva vođenje i motivisanje tima kako bi se tim osnažio da ispunjava zacrtane ciljeve. Ovi ciljevi ne bi bili ispunjeni ako se ne bi na adekvatan način upravljalo performansama, što znači da nadzor i merenje performansi članova tima treba da bude od suštinske važnosti kako bi se osigurao uspeh projekta.

Sve ovo navedeno ukazuje na to da treba strateški pristupiti planiranju ljudskih resursa u projektno orijentisanoj organizaciji, jer je prvi kontakt sa potencijalnim kadrovima najbitniji kako bi se oni osetili značajnim u organizaciji i kako bi im se posvetila dovoljna pažnja.

Upravljanje ljudskim resursima podrazumeva i razmatranje socijalnih, etičkih i kulturalnih faktora koji mogu da utiču na tim kao i na projekat što uključuje prilagođavanje upravljanje timom prema tim faktorima. Upravljanje ljudskim resursima na projektu može dovesti do efikasnog i uspešnog projekta, kao i motivisanog tima koji je spreman da pruži sve od sebe kako bi se projekat realizovao na što efikasniji i efektivniji način.

2.2. ALOKACIJA ULOGA I ODGOVORNOSTI NA PROJEKTU

Kao deo opširnije studije o praksi upravljanja ljudskim resursima (HRM) u projektno orijentisanim organizacijama, vršena je pitanje dobrobiti zaposlenih. U takvim organizacijama se usvajaju privremeni radni procesi za isporuku proizvoda i usluga klijentima, što dovodi do dinamičnog radnog okruženja. To može dovesti do dodatnih pritisaka na zaposlene zbog fluktuacija radnih opterećenja, neizvesnih zahteva i zahteva za višestrukim ulogama. Ovi pritisci mogu stvoriti probleme za dobrobit zaposlenih i zahtevaju etički tretman koji se mora upravljati. HRM tradicionalno ima dve uloge: ulogu podrške menadžmentu obezbeđujući organizaciji kompetentne ljude da preuzmu radne procese, i ulogu podrške zaposlenima brinući o njihovoj dobrobiti (Huemann, 2016). Ljudski resursi u organizaciji treba da se bave proučavanjem ponašanja ljudi i/ili grupa gde se ovi pravci bave određenim saznanjima da neki od različitih tipova ponašanja ljudi u organizaciji odgovaraju na stimulanse koji dolaze spolja ili su nametnuti od strane višeg rukovodstva – top menadžmenta. Ljudski resursi prilikom angažovanja treba da usklađuju kako individualne, tako i organizacione ciljeve. Sektor HR - *Human Resource* je svestan činjenice da su kriterijumi kompetencija prožimaju kroz razne obrasce ponašanja projektnih menadžera. Ljudski resursi predstavljaju ključnu komponentu bilo koje organizacije, a posebno projektno orijentisane organizacije jer predstavljaju prekretnicu za dalje poslovanje jedne organizacije. U takvoj organizaciji, uloga ljudskih resursa je još važnija, jer uspešno sprovođenje projekata zavisi od sposobnosti timova da efikasno sarađuju i komuniciraju. Kako bi ljudski resursi znali koje članove tima da izaberu za jedan projekat, neophodno je da imaju unapred definisane kriterijume za svaki projekat kako bi se na adekvatan način izvršila grupacija zaposlenih ili ipak izabrali novi eksterni članovi za budući projekat. Kako projektno orijentisana organizacija funkcioniše na principu projekata, kako privremenih tako i stalnih, jedan od velikih izazova za sektor ljudskih resursa je taj da osnaže zaposlene da se ne osećaju nesigurno prilikom završetka svakog projekta.

Projektno orijentisana organizacija je organizacija koja funkcioniše na principu projekata (Gemünden, 2018). U projektno orijentisanoj organizaciji, timovi se organizuju oko projekata, a članovi timova se biraju na osnovu njihove stručnosti i iskustva u datoj oblasti. Ovakav pristup omogućava fleksibilnost i prilagođavanje organizacije zahtevima projekata i brže donošenje odluka. Ljudski resursi imaju ključnu ulogu u uspešnom sprovođenju projekata u projektno orijentisanoj organizaciji. Neki od ključnih uloga ljudskih resursa su (prilagođeno prema Belout, 1998):

1. Planiranje ljudskih resursa - U projektno orijentisanoj organizaciji, ljudski resursi su planirani u skladu sa potrebama projekata. Ovo podrazumeva procenu potrebne stručnosti i iskustva za svaki projekat i izbor članova tima koji najbolje odgovaraju datom zahtevu.
2. Selekcija članova tima - Selekcija članova tima u projektno orijentisanoj organizaciji predstavlja izazov, jer timovi često moraju da se formiraju brzo i da rade na projektima sa kratkim rokovima. Ljudski resursi su zaduženi za identifikovanje i odabir kandidata koji su sposobni da efikasno rade u takvom okruženju.

3. Razvoj timova - Razvoj timova je ključan za uspešno sprovođenje projekata. Ljudski resursi su zaduženi za osiguranje da članovi tima imaju potrebne veštine i znanja za rad na projektu, kao i za održavanje timskog duha i motivaciju članova tima.

4. Komunikacija - Komunikacija je ključna za uspešno sprovođenje svih planiranih aktivnosti, ali i njihove realizacije i implementacije u projektno orijentisanoj organizaciji.

3. ULOGE LJUDSKIH RESURSA KOJE IMAJU TENDENCIJU DA NESTANU

U današnjem brzom i dinamičnom poslovnom okruženju, neke tradicionalne uloge ljudskih resursa postaju sve manje važne u organizacijama i imaju tendenciju da će nestati za par godina jer se uvode nove tehnologije AI (*Artificial Intelligence*) koje će skoro potisnuti ove uloge i zameniti ih novim tehnologijama i softverima. Ovo se posebno odnosi na sledeće uloge ljudskih resursa u projektno orijentisanim organizacijama:

1. *Administrator ljudskih resursa* - Ova tradicionalna uloga uključuje vođenje evidencije o zaposlenima, izdavanje potvrda i ugovora, obradu plate, upravljanje zdravstvenim, socijalnim, penzionim i životnim osiguranjem, obračun troškova zarade, vođenje evidencije o prisutnosti članova tima na projektima, administracija izveštaja i prosleđivanje istih nadležnom sektoru, itd. Međutim, moderni softveri za ljudske resurse sada omogućavaju automatizaciju ovih procesa, što znači da je manja potreba za osobom koja će ih obavljati, što ukazuje na to da ova pozicija sa protokom vremena polako nestaje ili se gubi potreba za ovom ulogom u organizaciji jer danas zadaci koji proističu iz ove uloge teže da se automatizuju i standardizuju.

2. *Koordinator ljudskih resursa (Human Resources Coordinator)* – navedena uloga uključuje koordinaciju aktivnosti ljudskih resursa, kao što su obuka i razvoj, upravljanje performansama, regrutacija, povezivanje radnih zadataka zaposlenih sa trenzima i obukama koje zaposleni treba da pohađaju kako bi nadmašili visokokvalitetne performanse projekata u projektno orijentisanim organizacijama. Međutim, ove aktivnosti se sada sve više uspostavljaju u okviru specijalizovanih timova i ne zahtevaju posebnog koordinatora.

3. *Odeljenje za zapošljavanje* - Tradicionalno odeljenje za zapošljavanje bilo je zaduženo za oglašavanje slobodnih radnih mesta i prenošenje informacija da je otvorena ili nova pozicija ili treba da se upražnjava postojeća, pored ovoga, ovo odeljenje je zaduženo za sprovođenje intervjua i odabir kandidata za posao što nije nimalo lak zadatak. Međutim, danas postoji sve veća upotreba *online* platformi za zapošljavanje koje funkcionišu po principu popunjavanja aplikativne forme sa ličnim podacima, slanje unapred napravljenog CV-ja i opciono slanje motivacionog pisma. Ovi automatizovani alati za selekciju kandidata prikupljaju sve navedene informacije i prema unapred zadatim kriterijumima vrše selekciju i odabir adekvatnih potencijalnih kandidata koji prolaze u sledeći krug, a to je ili intervju ili rešavanje testova sposobnosti koji su unapred definisani. Pored ovoga, vrlo često se dešava da rukovodilac projekata unapred zna koga će pozvati da radi na nekom projektu i koga će angažovati za poslove koje sledi, pa samim tim uloga ovog odeljenja i nije toliko značajna sa ovog aspekta angažovanja zaposlenih. Ovo ukazuje na to da se uloga odeljenja za zapošljavanje smanjuje ili ipak nestaje u mnogim projektno orijentisanim organizacijama.

4. *Savetnik za upravljanje ljudskim resursima* - Ova tradicionalna uloga uključuje pružanje saveta zaposlenima u vezi sa radnim pitanjima, kao što su radno vreme, godišnji odmor, bolovanja, razna osiguranja, unapređenje, nove beneficije koje pruža projektno orijentisana organizacija. Sa druge strane, moderne projektno orijentisane organizacije često imaju pristup *online* platformama ili drugim izvorima informacija koje zaposleni mogu sami da konsultuju i steknu uvid o pogodnostima koje organizacija pruža, ali i o ključnim odgovorima na pitanja koje oni imaju.

5. *Specijalista za radno pravo* - Ova uloga uključuje pružanje saveta organizaciji o zakonskim obavezama i zahtevima u vezi sa zapošljavanjem, radnim odnosima i zakonskim propisima. Međutim, ova uloga se sve više uključuje u aktivnosti drugih odeljenja, kao što su pravno odeljenje ili odeljenje za usklađenost. Takođe postoje i razni softverski alati koji pružaju odgovore na pitanja u vezi sa zakonima i regulativama na poslu, pa samim tim i uloga specijalista za radno pravo gubi na značaju.

Iako se ove uloge polako povlače iz organizacija, ljudski resursi i dalje imaju ključnu ulogu u unapređenju poslovanja i osiguravanju uspešnosti organizacija u budućnosti. Uprkos automatizaciji i tehnološkom napretku, zaposleni ostaju najvažniji resurs i ključni faktor uspeha organizacije pa se iz tog razloga ide ka tome da ove uloge nikada ne nestanu, jer je ljudski kadar uvek vredniji od platformi za automatizaciju procesa kada se govori o upravljanju ljudskim resursima u projektno orijentisanim organizacijama (Gubman, 2018).

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VREMENSKA DISTRIBUCIJA UZROKA KAŠNJENJA KAO NOV PRISTUP OTKRIVANJU BAZNIH UZROKA KAŠNJENJA

TEMPORAL DISTRIBUTION OF CAUSES OF DELAY AS A NEW APPROACH TO DISCOVERING THE ROOT CAUSES OF DELAY

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Apstrakt: Građevinski projekti su jedinstveni, dinamični i složeni. Karakteriše ih multidisciplinarno okruženje i veliki broj učesnika koji proizvode značajan obim podataka. Ovo su samo neki od razloga zašto građevinski projekti ne uspevaju da ostvare planirano trajanje. Otkrivanje baznih uzroka kašnjenja je prvi i najvažniji korak ka eliminisanju ili umanjeanju potencijalnih kašnjenja na budućim projektima. Postojeći pristupi se baziraju na ekspertskom mišljenju uz rangiranje uzroka kašnjenja prema parametrima kao što su verovatnoća pojave i mera uticaja na trajanje projekta. Ovakav pristup agregira subjektivizam i pristrasnost eksperata i shodno tome ne doprinosi otkrivanju baznih uzroka kašnjenja. Kroz ovo istraživanje se predlaže inovativni pristup otkrivanju baznih uzroka kašnjenja – analiza vremenske distribucije uzroka kašnjenja kao jedinstvena karakteristika DREAM-a (Delay Root-causes of delay Extraction and Analysis Model). Analizom informativnih grafikona vremenske distribucije eksperti mogu da razumeju prirodu kašnjenja kroz sve faze projekta i otkriju bazne uzroke kašnjenja. Na taj način se omogućava podrška donosiocima odluka na budućim projektima u cilju proaktivnog upravljanja rizicima.

Ključne reči: uzroci kašnjenja, bazni uzroci kašnjenja, vremenska distribucija, DREAM, rudarenje po tekstualnim podacima, građevinski projekti.

Abstract: Construction projects are unique, dynamic, and complex. They are characterized by a multidisciplinary surrounding with a large number of project stakeholders, which produce a massive corpus of data. These are some of the reasons why construction projects fail to achieve the planned duration. Discovering the root causes of delays is the first and most important step towards eliminating or mitigating potential delays in future projects. Existing approaches are based on expert opinion with the ranking of the causes of delay according to parameters such as the probability of occurrence and the measure of impact on the project's duration. This approach aggregates the subjectivism and bias of experts and does not contribute to the discovery of the root causes of delays. Based on this research, an new approach to discovering the root causes of delay is proposed - analysis of the temporal distribution of the causes of delay as a unique feature of DREAM (*Delay Root-causes of delay Extraction and Analysis Model*). By analyzing informative charts of temporal distribution, experts can understand the nature of delays throughout all phases of the project and discover the root causes of delays. In this way, it is possible to support decision-makers in future projects in order to proactively manage the risks.

Keywords: causes of delay, root causes of delay, temporal distribution, DREAM, text mining, construction projects.

1. UVOD

Prema istraživanju CIOB - a (The Chartered Institute of Building) kašnjenja su prisutna na građevinskim projektima širom sveta, u rasponu od 30% do 80%, u zavisnosti od vrste projekta. Uprkos velikom broju istraživanja i unapređenju kolektivnog znanja u oblasti upravljanja vremenom na projektu, trendovi kašnjenja su ostali nepromenjeni u poslednjih 50 godina. Najveći broj istraživanja se bazira na identifikaciji uzroka kašnjenja za srodne projekte grupisane po vrsti ili kategoriji. Takva istraživanja se zasnivaju na anketama ili intervjuima sa ekspertima čiji rezultati su liste uzroka kašnjenja rangirane na bazi indeksa relativnog značaja (RII). U tom kontekstu, od učesnika empirijskog istraživanja se očekuje da se odrede verovatnoća pojave i mera uticaja na kašnjenja na projektu. Ovakva istraživanja samo „recikliraju” uzroke kašnjenja (Agyekum-Mensah et al., 2017), bez rekonstrukcije događaja na nivou pojedinačnog projekta i otkrivanja baznih uzroka (Ivanović et al., 2022).

S druge strane, primetan je nedostatak studija koje se baziraju na analizi dokumentacije sa projekta, kao relevantnom izvoru u procesu identifikacije uzroka kašnjenja. Jedan od glavnih razloga se odnosi na obim i kompleksnost upravljanja obimnom dokumentacijom sa projekta. Prema nekim istraživanjima, prosečan građevinski projekat proizvede oko 10.000 različitih dokumenata tokom svog životnog ciklusa. Najveći deo, više od 80% je u nestrukturiranom tekstualnom format (Đ. L. Nedeljković, 2018).

Razvoj veštačke inteligencije (Artificial Intelligence - AI) omogućava prevazilaženje problema manuelnog upravljanja dokumentacijom na projektu. Istraživanja su pokazala da upravljanje zasnovano na podacima povećava produktivnost rada za oko 5% (Abbaszadegan et al., 2015). Primena tehnika za rudarenje po tekstualnim podacima (*text mining*), kao oblast dubokog mašinskog učenja, omogućava prevazilaženje problema koji se odnose na ekstrakciju znanja iz obimnog korpusa tekstualne dokumentacije.

Prethodno razvijen model za detekciju i analizu uzroka kašnjenja – DREAM (Ivanović et al., 2022) se bazira na Transformer jezičkim modelima koji omogućavaju automatsku detekciju uzroka kašnjenja iz tekstualne dokumentacije. Izabrana dokumentacija integrisana u model su zapisnici sa sastanaka zato što sadrže sveobuhvatne, pravovremene informacije o uzrocima kašnjenja. Dodatno, zapisnici sa sastanaka predstavljaju nedeljna izveštavanja o stanju na projektu što omogućava praćenje uzroka kašnjenja kroz sve faze realizacije projekta. Upravo ova karakteristika izabrane dokumentacije je omogućila razvoj novog koncepta – analiza vremenske distribucije uzroka kašnjenja. Zahvaljujući vremenskoj distribuciji i ekspertskom tumačenju trendova uzroka kašnjenja moguće je otkriti koji su bazni uzroci kašnjenja na nivou pojedinačnog projekta.

Cilj ovog istraživanja jeste prikaz značaja vremenske distribucije u procesu otkrivanja baznih uzroka kašnjenja na nivou pojedinačnog projekta. Postupak i dobijeni rezultati biće ilustrovani na projektu studije slučaja auto-puta u Srbiji.

2. PREGLED LITERATURE

Većina studija koristila je upitnike ili intervjuue za identifikaciju uzroka kašnjenja. Doprinos ovih studija predstavlja listu uzroka kašnjenja za različite vrste građevinskih projekata, različite geografske regije i sa aspekta različitih učesnika na projektu. Na primer, Mahamid et al. (2012) su istraživali uzroke kašnjenja na projektima izgradnje puteva u Palestini, Assaf et al. (2006) su istraživali uzroke kašnjenja za različite vrste velikih građevinskih projekata u Saudijskoj Arabiji, Fallahnejad (2013) je proučavao uzroke kašnjenja na projektima gasovoda

u Iranu, itd. Većina studija usmerena je na uzroke kašnjenja u fazi izgradnje. Međutim, neke studije su se bavile uzrocima kašnjenja u fazi planiranja i projektovanja (Yang et al., 2010).

Postoji mali broj istraživanja koji uspostavlja razliku između uzroka (causes) i baznih uzroka (root causes) kašnjenja (Flyvbjerg Bent, 2011) (tabela 1). U literaturi se razmatraju neki od načina da se utvrde bazni uzroci kašnjenja. Na primer, Viles et al (2020) navode da identifikaciji osnovnih uzroka kašnjenja doprinosi podela uzroka na grupe i nivoe. Osim toga, koriste se različite tehnike kao što su RCA (Sweis et al., 2019), in-depth intervjui (Ellis et al., 2003) i slično.

Tabela 1. Pregled istraživanja baznih uzroka kašnjenja sa odabranom metodologijom

Studija	Tip projekta	Zemlja	Metodologija	Bazni uzroci kašnjenja (RCD)
(Sweis et al., 2019)	Naftovodi i gasovodi	Iran	RCA	Loše upravljanje budžetom; Izmene u regulativi; Politička situacija; Iskustvo i kompetencije učesnika; Finansijske poteškoće
(Ellis et al., 2003)	Auto-putevi	Florida	<i>in-depth</i> intervjui, studije slučaja	Praksa poslovanja; Procedure; Neadekvatni i nepredviđeni uslovi u terenu; Greške u projektnoj dokumentaciji
(Abbasi et al., 2020)	Građevinski projekti	Iran	fishbone i Ishikawa dijagrami	Finansijski problemi izvođača radova

Kada je reč o potrebi za uvođenje parametara koji dodatno opisuju poremećaje na projektu, u studiji (Lee et al., 2019) se predlaže praćenje posmatranog koncepta kroz vreme i prostor. Autori u istraživanju (Đ. Nedeljković et al., 2017) naglašava važnost praćenja ključnih fraza kroz vreme kako bi se dobile relevantne informacije za posmatrani koncept.

S druge strane, primena tehnika rudarenja po tekstualnim podacima (*text mining*) predstavlja oblast u ekspanziji u domenu upravljanja projektima. Rudarenje po tekstualnim podacima ima tri primarne svrhe u upravljanju projektima: pronalaženje informacije (*information retrieval*) (Yu et al., 2013; Zou et al., 2017), klasifikacija dokumenata (*document classification*) (Caldas et al., 2003) i otkrivanje znanja (*knowledge discovery*) (Le et al., 2017; Tixier et al., 2016).

Postojeća istraživanja o uzrocima kašnjenja pružaju vredan doprinos, međutim nisu u kontekstu rešavanja problema (AlSehaimi et al., 2013). Iako je prepoznat problem baznih uzroka kašnjenja, većina pristupa koristi empirijske metode koji neminovno agregiraju subjektivizam i pristrasnost učesnika otežavajući donošenje zaključaka.

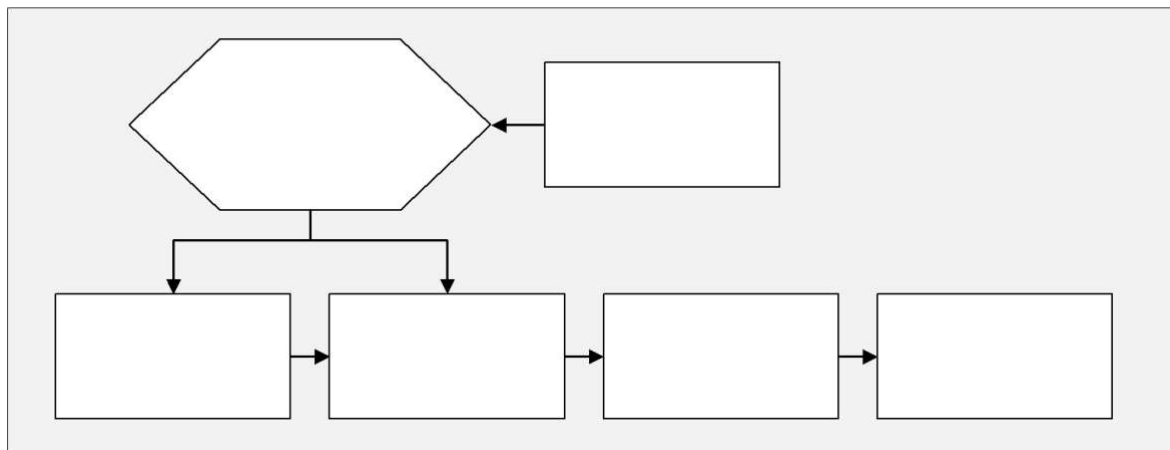
U narednom delu sledi kratak predlog metodologije za otkrivanje baznih uzroka kašnjenja na bazi DREAM-a predloženog u istraživanju (Ivanović et al., 2022).

3. METODOLOGIJA

Kako je i definisano u istraživanju (Ivanović et al., 2022) postoje dva nivo doprinosa DREAM-a. Prvi se odnosi na automatsku detekciju uzroka kašnjenja, dok drugi predlaže vremensku distribuciju detektovanih uzroka kašnjenja. Zahvaljujući odabranoj dokumentaciji, moguće je pratiti određeni koncept, u ovom slučaju uzroke kašnjenja, kroz sve faze projekta. Glavna pretpostavka jeste da praćenje uzroka kašnjenja kroz sve faze projekta omogućava otkrivanje baznih uzroka kašnjenja. Za razliku od uzroka kašnjenja, gde

DREAM pruža automatsku detekciju, za otkrivanje baznih uzroka kašnjenja su potreban ekspertska tumačenja vremenske distribucije kako bi se otkrilo „šta se stvarno pošlo po zlu“. Analitičko okruženje DREAM-a je omogućilo sagledavanje različitih pogleda na vremensku distribuciju, prema zahtevima korisnika. Prema tome, moguće je sagledati apsolutnu i relativnu distribuciju za različite nivoe uzroka kašnjenja. Na slici 1 je prikazana šema metodologije otkrivanja baznih uzroka kašnjenja.

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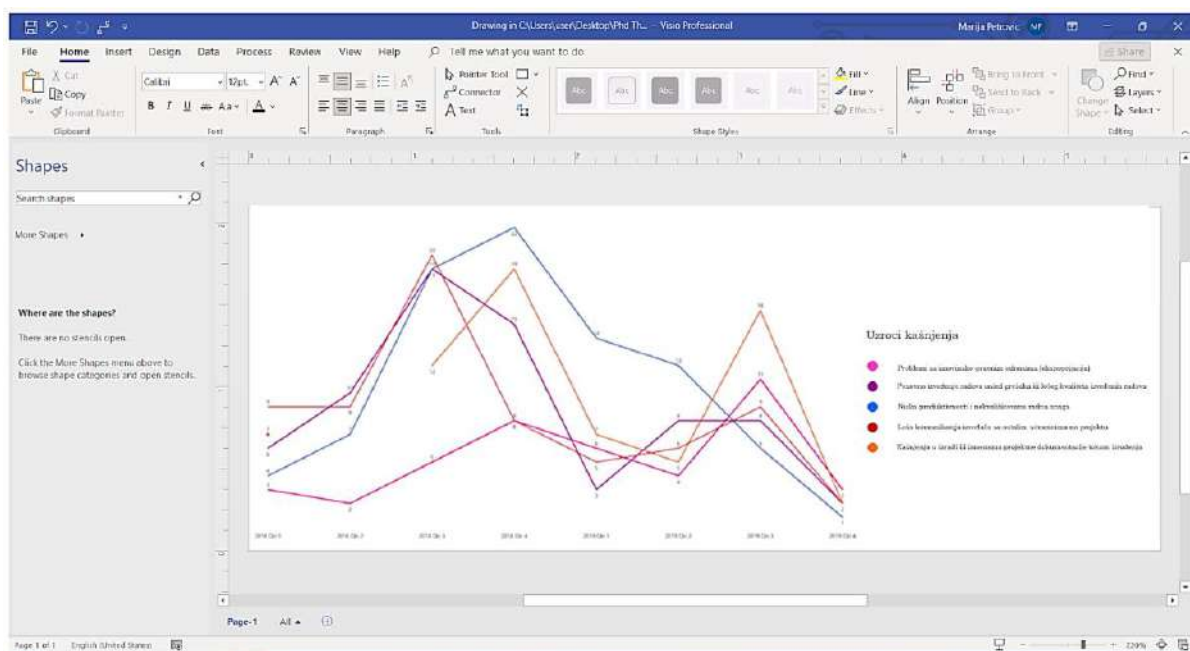
Slika 1: Metodologija otkrivanja baznih uzroka kašnjenja (*root causes of delay*)

3.1 STUDIJA SLUČAJA

Projekat studije slučaja predstavlja izgradnju auto-puta u Srbiji. Projekat se sastoji od dve deonice ukupne dužine 65 km. Projekat je ugovoren po Red Fidic uslovima ugovaranja. Izvođač radova je bila strana kompanija sa velikim brojem domaćih podizvođačkih firmi, dok su stručni nadzor i investitor bili domaća javna preduzeća. Post-projektni izveštaji sa ovog projekta ukazuju samo na dve značajnosti. Prva, da je projekat završen sa minimalnim prekoračenjem troškova (5% prekoračenja ugovorene vrednosti radova), i druga, da je prekoračenje roka iznosilo 50% u odnosu na ugovoreno trajanje radova .

4. REZULTATI

Analitičko okruženje DREAM-a je omogućilo sagledavanje vremenske distribucije uzroka kašnjenja prema zahtevima korisnika. Na slici 1 je prikazana apsolutna vrednost vremenske distribucije 5 najzastupljenijih (u zapisnicima sa sastanaka) uzroka kašnjenja.

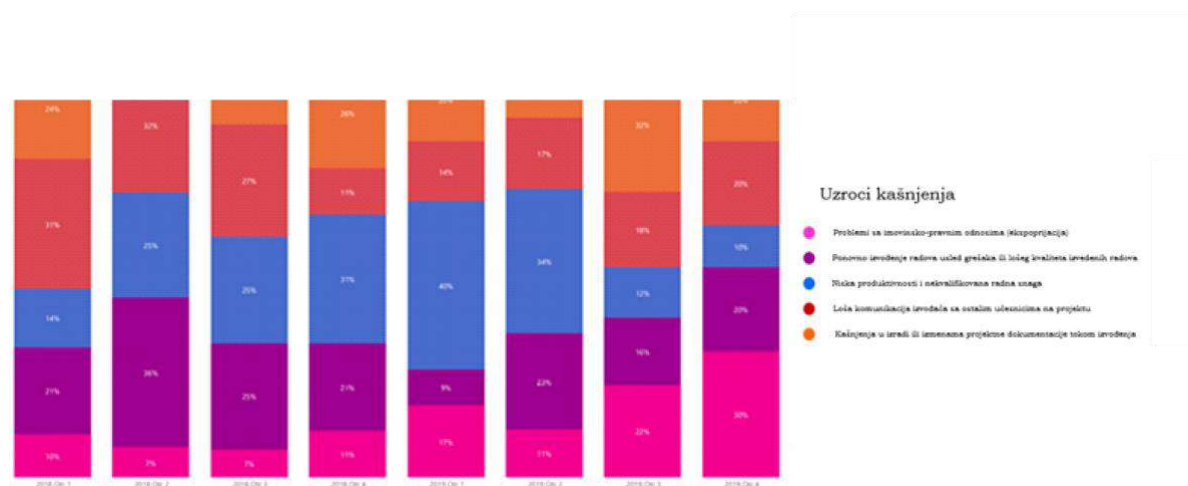


Slika 1. Apsolutna distribucija pet najzastupljenijih uzroka

Sa grafika apsolutne distribucije se mogu uočiti neke značajnosti u vezi uzroka kašnjenja.

- *Niska produktivnost i nekvalifikovana radna snaga* (plava boja) jeste uzrok kašnjenja koji ima najveću zastupljenost od svih detektovanih uzroka. Pojedinačno posmatrano, ovaj uzrok može ukazivati na loše performanse izvođača ili njegovih podizvođača. Dodatno, u pet najzastupljenijih uzroka kašnjenja detektovani su i uzroci *Ponovno izvođenje usled grešaka ili lošeg kvaliteta izvedenih radova* i *Loša komunikacija izvođača sa ostalim učesnicima na projektu*. Sve navedeno ukazuje da je jedan od baznih uzroka kašnjenja Loše performanse izvođača radova.
- *Kašnjenja u pripremi ili izmenama projektne dokumentacije* (narandžasta boja) je uzrok prisutan tokom većeg trajanja projekta. Posmatrajući druge, ovaj uzrok ima izražene promene trenda. Ovakve informacije mogu ukazivati na značaj ovog uzroka za ceo projekat. Takođe izražene promene trenda zastupljenosti mogu ukazivati i na stepen rešivosti ovog problema. Na primer, izraženi nagibi krive vremenske distribucije mogu ukazivati na agilnost projektnog tima u cilju rešavanja problema. Evaluacija učinka projektantskog tima je izazovan zadatak koristeći postojeće pristupe

Analiza relativne distribucije uzroka kašnjenja može dopuniti zaključke donete na bazi apsolutne distribucije, ali i doprineti novim saznanjima. Relativna distribucija pet najzastupljenijih uzroka kašnjenja je prikazana na slici 2.



Slika 2: Relativna distribucija pet najzastupljenijih uzroka kašnjenja

- *Niska produktivnost i nekvalifikovana radna snaga* maksimalnu zastupljenost ima na sredini projekta. Osim na performanse izvođača, prisustvo ovog uzroka može ukazivati i na performanse podizvođača (uvidom u dokumentaciju se mogu utvrditi učesnici u svakoj fazi realizacije)
- Uzrok *Problemi sa imovinsko-pravnim odnosima* (ljubičasta boja) povećava relativnu zastupljenost kako izvođenje radova napreduje, iako se njegova apsolutna zastupljenost smanjuje. Prividno smanjenje apsolutne zastupljenosti može biti i posledica smanjenja broja zapisnika kako se projekat bliži kraju. Analiza relativne distribucije ukazuje da je ovaj uzrok zasigurno doprineo kašnjenju projekta.

Na bazi analize rezultata može se zaključiti da su bazni uzroci kašnjenja na projektu studije slučaja *Loše performanse izvođača radova* i *Nerešena ekspoprijacija*.

5. ZAKLJUČAK

Prekoračenje roka predstavlja jedan od najznačajnijih kriterijuma uspeha projekta. I pored veliko broja istraživanja i unapređenja kolektivnog znanja u ovoj oblasti, više od 80% projekata širom sveta je izloženo kašnjenju. Trenutna istraživanja “recikliraju” postojeće empirijske metode za identifikaciju uzroka kašnjenja, bez detaljne analize događaja i utvrđivanja baznih uzroka kašnjenja.

Kroz ovo istraživanje je predstavljen metodološki postupak za otkrivanja baznih uzroka kašnjenja uvođenjem koncepta analize vremenske distribucije. Grafikoni vremenske distribucije, kao jedan od doprinosa DREAM-a i kvalitativna ekspertska analiza formiraju analitičko okruženje za otkrivanje baznih uzroka kašnjenja, što je bio i krajnji cilj istraživanja. Ovakvim pristupom omogućena je rekonstrukcija i praćenje događaja tokom svih faza realizacije projekta kako bi se otkrili bazni uzroci kašnjenja. Tumačeći grafikone vremenske distribucije moguće je otkriti šta je pošlo na nivou pojedinačnog projekta. Prema dobijenim rezultatima, pogled na vremensku distribuciju uzroka kašnjenja omogućava detaljnu analizu događaja na projektu i otkrivanje baznih uzroka kašnjenja, a samim tim i značajan naučni i praktični doprinos. Pouzdani podaci o baznim uzrocima kašnjenja na nivou

pojedinačnog projekta omogućavaju podršku donosiocima odluka na budućim projektima u cilju eliminisanja ili umanjivanja kašnjenja.

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STRATEGIJSKO PLANIRANJE U FUNKCIJI FINANSIRANJA INTERDISCIPLINARNIH PROJEKATA

STRATEGIC PLANNING IN THE ROLE OF FINANCING INTERDISCIPLINARY PROJECTS

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Apstrakt: Model planiranja u Ministarstvu odbrane i Vojski Srbije razvijen je početkom ovog veka sa ciljem da se dotadašnji diskontinuitet u planiranju prevaziđe i da se uz finansijska ulaganja od strane države, omogući razvoj i održavanje postojećih sposobnosti i kapaciteta vojske. Model planiranja koji je tada uveden je kompatibilan sa modelima najsavremenijih vojski sveta, ali i sa programskim budžetiranjem koje primenjuje Republika Srbija. Strategijsko planiranje misija i ciljeva Vojske Srbije se realizuje kroz sve faze planiranja prema vremenskom horizontu ali konkretno se izvršava programskim budžetiranjem. Programsko budžetiranje podrazumeva upravljanje prema učincima i rezultatima rada, a samim tim i projektno finansiranje. Projektno finansiranje je deo programskog budžetiranja, usmereno je ka rezultatima rada i na veoma efikasan način omogućava merenje učinaka. Cilj ovog rada jeste da ukaže na povezanost strategijskog planiranja u Ministarstvu odbrane i Vojski Srbije sa finansiranjem interdisciplinarnih projekata. Upravo stoga, jer je finansiranje projekata za Ministarstvo odbrane i Vojsku Srbije regulisano pravno i normativno, ali u savremenim uslovima kada interdisciplinarnost predstavlja i superiornost, finansiranje takvih projekata je definitivno strateški izazov za svaku državu koja želi da ima jaku i spremnu oružanu silu.

Ključne reči: model planiranja, strategijsko planiranje, projektno finansiranje, interdisciplinarni projekti.

Abstract: The planning model in the Ministry of Defense and the Serbian Armed Forces was developed at the beginning of this century to overcome the present discontinuity in planning and investment by the state, enabling the development and maintenance of existing capabilities and capacities of armies. The planning Model then introduced is compatible with models of the most modern armed forces in the world and with the program budgeting applied by the Republic of Serbia. Strategic planning of missions and objectives of the Serbian Armed Forces is carried out through all phases of planning according to the time of the program. Still, in particular, it is funded by the program. Program budgeting involves managing the work's performance and results; therefore, it is the project funding. Project funding is part of program budgeting, focused on results and in a very efficient way that allows measuring the effects. This paper aims to show the connection between the Ministry of Defence's strategic planning and the Serbian Armed Forces with financing interdisciplinary projects. As the Ministry of Defence's and Serbian Armed Forces projects funding is regulated legally and normatively, but in current conditions when interdisciplinarity is also superior, financing such projects is a strategic challenge for any state that wants to have a solid and ready armed force.

Keywords: Planning Model, Strategic Planning, Project Financing, Interdisciplinary Projects.

1. INTRODUCTION

Globalizacija, Globalization, technological development and geopolitical changes in this century require changes and Implementation of strategic orientation of the institutions and organizations (Mihić & Obradović, 2012). Changes in the geopolitics and economic environment, security risks and threats, and current business conditions require constant and continuous monitoring by the appropriate services and institutions to create conditions for unhindered functioning and development of the Society of each state. With the development of Society, the environment has changed to become increasingly more complex forms and phenomena required from participants at all levels an increasing level of knowledge and training. Today it is almost inconceivable that one does not learn and improve in any profession. Even with the emergence of artificial intelligence and many other modern societies, there is a tendency to expect the extinction of many centuries-old disciplines (Vuksa et al. 2020).

In addition, new and previously non-existing businesses are emerging. With the complexity and the conditionality of connecting many pre-existing professions and eventually functions into one, there is a need for interdisciplinarity in all spheres of Society.

The Armed Forces are one of the segments of Society with clearly defined missions and tasks. Most of them have not changed since the emergence of the need for the military to ensure the state's security. They are facing new challenges and threats as a Society in general, globally and in the immediate environment. Modern forms of warfare and the use of state-of-the-art weaponry and sophisticated techniques, up to now, with unimaginable consequences, demand from the decision-makers at the highest level that our Armed Forces have to be equipped, trained and prepared to respond to any potential challenges. For this purpose, a planning model was developed in the Ministry of Defense and the Serbian Armed Forces, which ensures that, even under restrictive financing conditions, the maintenance of existing capabilities and capacity of the Armed Forces, but also the development of new ones, remains in effect. This model is also compatible with programme budgeting in the Republic of Serbia, introduced monitoring by performance and results work, which further increases decision-makers responsibility in the Ministry of Defense and the Serbian Armed Forces for the funds. One of the main problems for Knowledge Management in the project environment is a poor analysis of the success of the project and a lack of appropriate documentation of the results of previous projects. Therefore, a form involving analysis approached the success of the project through the definition of critical success factors, key performance indicators and the process of measuring the performance brought about by the project (Todorović et al. 2015). It is actively worked on the concept of Knowledge Management in the Ministry of Defense and the Serbian Armed Forces, which is considered a priority in management (Mitrović et al. 2018).

Funding for non-prospective projects remains a distant past, and only funded projects are funded; if they give results in the present and future. The unpredictability of the future and the current environment inevitably demand interdisciplinarity in all areas of life, especially in each state's Defence and Security field.

1.1 MODEL OF PLANNING IN THE MINISTRY OF DEFENCE AND THE ARMY OF SERBIA

At the beginning of the 21st century, the Ministry of Defense and the Serbian Armed Forces decided to develop a model of planning that could respond to the then-current environmental challenges and threats and would be compatible with the program budgeting introduced by the state and the situation in military terms. A decade-long hiatus in Defense planning, the

absence of long-term and medium-term planning documents has failed to provide the minimum amount of funding available. Namely, decision-makers in the Ministry of Defense and the Serbian Armed Forces could not reach a consensus on how to spend the available financial resources for equipment and infrastructure (Knežević et al. 2009). A non-profit organization, where the number of employees is a staggering 75% of total defence expenditures, operational about 20%, and investments only 5% of total spending, could not ensure the development of new capabilities and capabilities of Defense (Image 1).



Figure 1. Structure of military budget expenditure (Knežević, M., 2021)

Lack of guidelines or criteria for priority funding in the form of long-term or mid-term planning documents ended with the return of funds to the budget. At the same time, the procurement of food items, energy and other operating costs were realized, and the remaining outstanding and transferred as liabilities to the next budget year. The Planning Model has been developed and introduced since 2008. As the years have passed, it has been set and re-designed so that today it can be said that it is compatible with the model of planning in the Republic of Serbia, but also with the most modern armed forces of the world, to be able to respond to contemporary challenges in Society and beyond (Image 2).

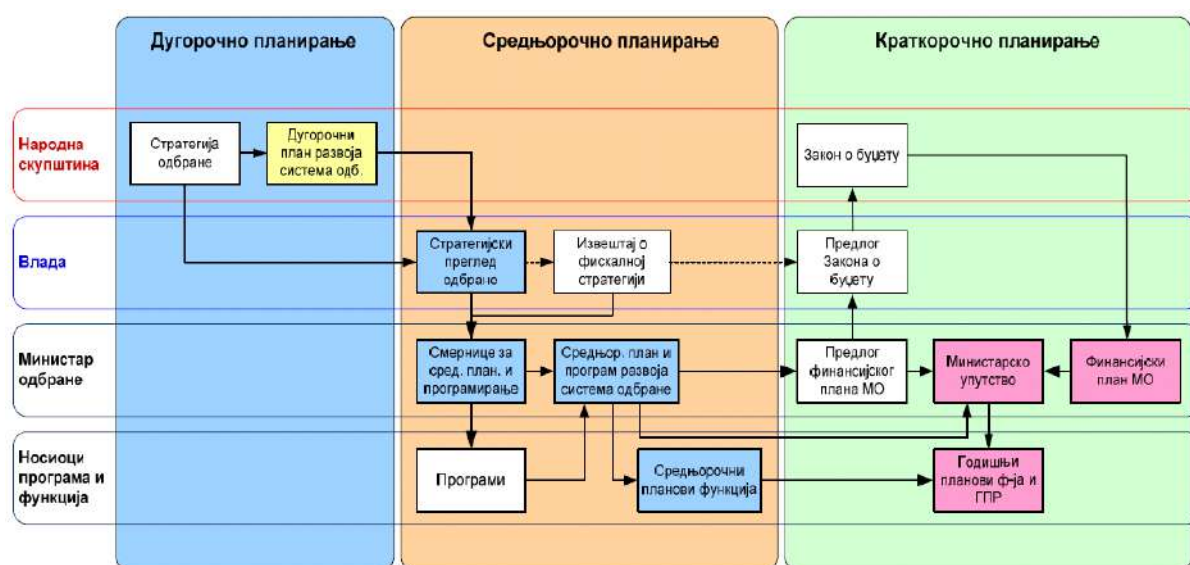


Figure 2. Planning Model (Regulations, 2010)

Strategic planning (Borocki et al. 2009) is defined by guidelines and directions development of the Ministry of Defense and the Serbian Armed Forces, and is implemented through several medium-term plans and programs. Project funding with the Project budgeting is only part of the medium-term planning of the Ministry of Defense and the Serbian Armed Forces. Defining and implementing all programs and projects is carried out through more short-term, i.e., the Ministry of Defense and the Serbian Armed Forces annual plans. Deficiency of financial resources generally requires that they be managed rationally (Avakumović et al. 2021) and economically to plan and fund priority projects and programs following strategic orientations.

1.2 FUNDING OF INTERDISCIPLINARY PROJECTS IN THE MINISTRY OF DEFENCE AND THE SERBIAN ARMED FORCES

The complex security situation at the global and regional levels requires continuous strengthening and development of the Armed Forces' new capabilities. The most recent wars are being fought on the interdisciplinary defence approach in safeguarding security in the modern world. In such circumstances, the project's financing must be able to provide funding for multidisciplinary projects that can respond to these challenges (Benković et al. 2010). The financing of such projects is carried out under applicable legal and regulatory regulations but is primarily intended. I.e., by the established activities of the project and according to the accounts of the economic classification.

Financing of projects of the Ministry of Defense of The Republic of Serbia, which develop weapons and military equipment, is regulated through the budget fund for armaments and military equipment. However, scientific research projects at the University of Defense since 2016. the years are funded by Budget funds to develop military education and military scientific research activities. As of 2023. there is no budget for the year, but there is a program for developing military education and scientific research activities (Mihajlović et al. 2020). Sources of funding for scientific research In addition to the University's budget, there are revenues from the University that operates based on education and scientific research activities as well as income from previous years. The complex security situation at the global and regional levels requires continuous strengthening and development of the Armed Forces' new capabilities. In such circumstances, the project's financing must be able to provide funding for interdisciplinary projects (Milojević et al. 2019) that can respond to these challenges. The most recent wars are being fought on the multidisciplinary defence approach in safeguarding security in the modern world. The financing of such projects is carried out under applicable legal and regulatory regulations but is primarily intended. I.e., following the established activities of the project and according to the accounts of the economic classification. Financing of projects of the Ministry of Defense Of The Republic of Serbia, which develop weapons and military equipment, is regulated through the budget fund for armaments and military equipment. However, scientific research projects at the University of Defense since 2016. Budget funds fund the years to develop military education and scientific research activities. As of 2023. there is no budget forthe year, but there is a program for developing military education and scientific research activities. Sources of funding for scientific research in addition to the University's budget. There are also revenues from the University activities based on education and scientific research activities and income from previous years.

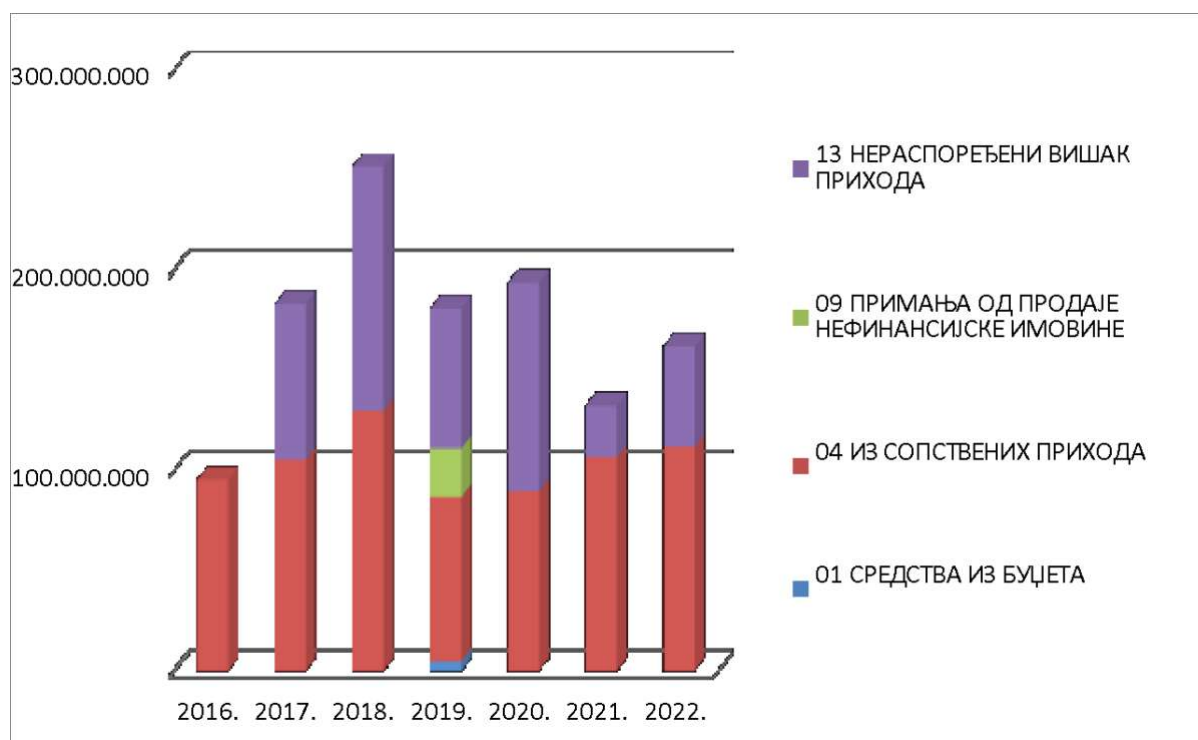


Figure 3. Sources of funding of the budget fund for the development of education and military NID

Based on the data in Image 3, it is possible to see an increase in financial resources for scientific research needs since 2016. until 2018. year, then a smaller decline until 2022. year. In 2016. in the past, the fund has only available funds from its income. As of 2017. years, in addition to its revenue, it comes with an unallocated income. While 2019. year because it is next to these two funding sources and received payment from the sale of non-financial assets and funds from the budget.

All the activities related to military development are financed from this budget fund for military education and military scientific research activities (Pantić et al. 2020). Projects approved by the Ministry of Defence, especially interdisciplinary, are financed mainly by funds from the Ministry's defence budget. Scientific research projects supported by the Ministry of Science, technological development and Innovation are funded by that Ministry. The funding sources are diverse, projects and their purpose varies, and interdisciplinarity is increasingly represented.

Examples of interdisciplinary defence projects are "The development of the ability to defend against terrorism" and "Management model defence system capabilities development". The most successful implementation of this project requires the participation and synergistic action of several Sciences and disciplines., of each state's ministries, departments, and services (Savić, 2022). Today, terrorism has many forms and different phenomena. It doesn't show up like it did ten years ago. Modern technology and technology have made it possible to terrorists to act in the most treacherous, covert and diverse ways much faster and more precisely. Developing the defence system's capabilities implies an interdisciplinary approach. Therefore, this project at the University of Defense includes researchers from various scientific fields with knowledge essential to the military.

2. CONCLUSION

The complex security situation at the global and regional levels requires continuous strengthening and development of the Armed Forces' new capabilities. In such circumstances, the project's financing must be able to provide funding for interdisciplinary projects that can respond to these challenges. The latest conflicts of war are evidenced by the multidisciplinary approach of Defense in the construction of the new ability of the military to defend and preserve security in the modern world. At the beginning of the 21st century, the Ministry of Defense and the Serbian Armed Forces developed a model of planning that could respond to the current environmental challenges and threats. The planning model that was introduced was compatible with the models of the most modern armies of the world but also with programs implemented by the Republic of Serbia. Strategic planning of the mission and the objectives of the Serbian Armed Forces are implemented through all stages of planning and are executed explicitly by the program budgeting. Program budgeting involves managing performance, work results, and project funding. Project funding is focused on the work's results and, in a very efficient way, allows measuring the effects. Based on the author, it is necessary to continue with strategic planning and financing focus on interdisciplinary projects. The authors also point to the need for funding interdisciplinary projects from multiple funds and opening up opportunities for connecting scientists and researchers in areas prioritized for the Armed Forces' missions and tasks.

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INTEGRISANOST PROJEKTNIH TIMOVA

INTEGRATION OF PROJECT TEAMS

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Abstract: The main goal of this research was to determine how much participation in projects affects the degree of integration of project teams and what changes there are in the social perception of participants regarding the evaluation of team (group) members. Group integration was examined using the sociometric method, whereby the following sociometric indicators were determined: group expansion and social status. "Project task" and "socializing in free time" were taken as sociometric selection criteria. The obtained sociometric indicators are correlated with personality dimensions measured by the Directive Attitudes Scale (DS). The results show that teamwork contributed to a better mutual acquaintance of the team members and the construction of more valid criteria for evaluating those crucial qualities for the execution of project tasks and socializing. No significant correlations with social expansion and social status were obtained regarding the directiveness of attitudes. Correlations between emotional dimensions of personality and sociometric indicators in the entire sample are very low. Still, they are highly significant within specific groups (teams), which can probably be attributed to leadership style (method).

Keywords: project, team, integration, military organizational system, management.

1. INTRODUCTION

In the military organizational system or for the needs of the defence system, the jobs and tasks performed have the characteristics of a project (Knežević, et al., 2021). Managing human, material, financial, energy and other resources to achieve goals with limitations: the possibility of realization, time, deadlines, budget, and satisfaction of interest groups, is project management (Andrejić, et al. 2011). Organizational management "projectization" (Obradović, et al., 2015) originated from the military organizational system to create social value, which is the security of society to sustain operational capabilities. As Knežević states, the foundations of project management were laid in the public sector (Knežević, et al. 2018). In many project-based industries, there has recently been an increased tendency towards collaboration and co-creation of value with stakeholders for business sustainability (Todorović & Obradović, 2018; Toljaga-Nikolić, et al. 2020). Project-based partnership, made up of multiple interest groups, is challenging due to its temporary nature that is formed to deliver new results jointly. The unstable environment and changes are constant in military organizational systems because they work in the internal and external domains. In modern conditions of high uncertainty and change, only adaptive organizations survive, that is, those that are able to immediately react to changes and proactively take advantage of the changes (Andrejić, et al. 2011).

In the military environment, good interpersonal relations, especially in combat situations, are a strong source of combat morale and safety in combat. The psychology of interpersonal relations, starting with Mayo's first research (Mayo, 1924; according to Šuković, 1979), emphasizes the importance of the social climate on satisfaction and motivation for work. One of the first studies of the social environment in military units is the work of J.G. Jenkins (J.G.

Jenkins, 1947; according to Smiljanić-Čolanović, 1973). He studied the morale of two naval air squadrons during World War II. The study results showed that confidence was higher in the squadron, where the social connection between the members and the attachment to the commander was higher.

Apart from similarity in personality traits, as a factor of attraction, the physical proximity between people engaged in some joint activity contributes to a better acquaintance and mutual interest (there is a greater possibility that people express the need for companionship - affiliation and cooperation). Of course, proximity and mutual contact do not necessarily contribute to attraction by themselves. They only create conditions in which the essential personality traits can be better manifested; that is, the characteristics of other people can be observed (Obradović et al., 2018). Many have also argued that the institutional level gives soldiers a greater group identity to unite members from lower organizational levels (Salo, 2011).

So far, social climate studies have been carried out in the project environment, which differs significantly from other working conditions in terms of the way and contents of the activities (Rogers, 2014; Duggan, & O'Neil, 2013). The social climate's quality is also a critical success factor (Šaranović et al. 2016). According to (Thamhain, 2004) a human manages projects, i.e. initiates team performance, as part of a project team. Rodgers stated that project managers rely on individuals in the project team to complete the project task, and the success of those individuals affects the success of the project; therefore, the individual as part of the team is significant (Rogers, 2019). Similarly, Todorović emphasizes the significant influence of the values of project team members on the knowledge management process in a project environment (Todorović et al., 2015). According to the above, the project team is "a set of individuals who support the project manager in performing project tasks to achieve his goals" (PMBOK, 2016, p. 717). Bearing in mind the fact that in military organizational systems (Sundberg, & Ruffa, 2021), conditions are created that are closest to the "final" (crisis) criterion of military success and that individuals as members of the project team during that time work in the same conditions and perform almost the same activities, there is a need to study the work on the project from the point of view of the psychosocial climate in research organizations. According to Rogers, the cause of a project's success or failure lies in the individuals who, in theory, make up the project team (Rogers, 2019; Anantatmula, & Rad, 2018). This study reveals a gap in the literature on project management and the impact of the integration of team members who make up the project team on project success.

2. RESEARCH PROBLEM

"Great things in business are never done alone; they're done by a team." (Steve Job)

Integration means any process that leads to the unification of parts into a functional whole, or a state of unification and wholeness, achieved to some degree (Krstić, 1991). The problem of this research is the degree of integration of project teams at the beginning and the end of the project task. Two sociometric indices were taken as indicators of integration: the index of group expansion, as an indicator of the attachment of an individual to the group, and the index of social status, as an indicator of the well-being (acceptance) of the individual in the group. These indicators were determined based on two sociometric choices, namely: 1) "project task" and 2) "socializing in free time".

The index of group expansion reflects the sociability of group members, that is, the output of their needs and desires for cooperation and trust in other people. In a numerical sense, it represents the number of choices according to one group (team) plan: the average number of options given to others. The social status index is an indicator of an individual's reputation and prestige within his group (team). In numerical terms, it means the number of votes received from other members within its group (team).

The main goals of this part of the investigation were to determine how much participation in the project affects the degree of integration of project teams and what the connection is between some personality traits of individuals and sociometric indicators. The dependent variable in this research is the integration of project teams, expressed through two sociometric hands: social expansion (number of elections given) and social status (number of elections obtained). The following sociometric selection criteria were taken: "project task" and "socializing in free time". The independent variables in this part of the research are one conative dimension of personality, measured by the Test of Directive Attitudes (DS). The conative personality trait in this part of the study was the bipolar dimension of directiveness - non-directiveness. Directivity means the effort of a person to direct and control the actions and ways of experiencing other people following his convictions. In contrast, the opposite sex ("non-directiveness") implies avoiding such efforts.

The following measuring instruments were used in this research

- 1) Sociometric test with the following criteria: a) selection of individuals from the project team for joint participation in the execution of project tasks and b) selection of colleagues from the project team for socializing in free time;
- 2) Test of directive attitudes, which contains a scale of directive attitudes (scale DS) and a scale of extraversion (scale E) (U Miševa, 1992, Hadžiselimović, et al. 1979).

3. METHOD

The test was carried out on the premises of three institutes and in the manner prescribed by the Instruction for sociometric tests. The survey was conducted in groups, and the group size was a maximum of 35 respondents. The sample included 109 members of the Military Technical Institute (VTI), the Military Geographical Institute (VGI), and the Institute for Strategic Research (ISI).

Sociometric tests were carried out at the beginning of the research project and at the end of the final project report on the project results. Each test was preceded by a short motivational instruction explaining the purpose of the test. After that, instructions were given for the Sociometric test. Examination of personality traits was also carried out in the institutes mentioned above.

Statistical data processing was performed on a computer using multivariate analysis techniques. The relationship between social status and the group of expansiveness and independent variables - factors (personality traits measured by the Test of Directive Attitudes) was examined by correlation analysis and the significance of differences in sociometric indicators between the first and second examination - by t-test.

4. RESULTS AND DISCUSSION

4.1. DEGREE OF INTEGRATION ON THE PROJECT TASK

The degree of integration in the projects, as an indicator of the quality of the social climate, was examined at the beginning and the end of the project assignment. The results of the group expansion test are shown in Table 1.

Table 1. Group expansion

SELECTION CRITERIA	"TASK"			Level importance.	"SOCIALIZING"			Level importance.
	AS	SD	t-test		AS	SD	t-test	
At the beginning project	8.37	5.56			7.40	4.27		
			7.35	0.01			6.96	0.01
At the end of the project	5.46	5.37			5.17	4.61		

AC = arithmetic mean SD = standard deviation

4.1.1. GROUP EXPANSION AT THE BEGINNING AND END OF THE PROJECT ASSIGNMENT

The results show that with both criteria, the number of selections at the end of the project task decreases compared to the beginning. That difference is statistically significant at the 0.01 level. At the beginning of the project, the index of group expansiveness is higher for "project task" than for "hanging out", while in the second examination, these differences are more diminutive. Individual differences in the number of choices are very pronounced, as shown by the standard deviation coefficients. So, some choose a large number of those with only a few options each, which is one of the indicators of their insufficient integration in the group. It is essential to point out that the number of choices was unlimited. The individual could choose as much as he wanted and as much as he needed. These results do not confirm our expectations under theories of interpersonal attraction that physical and psychological proximity encourages social orientation and strengthening of interpersonal ties. The obtained results point to the conclusion that the project task and the environment of membership in the project team (group) are a specific situation in which more valid assessment and evaluation criteria are acquired. While they are in the so-called regular departmental environment, they are evaluated more from the point of view of "business roles", and on the project task more from the point of view of "leadership role" as a professional orientation. From the point of view of that role, the selection criteria also become stricter and different, which leads to differences in the preference of traits for selection. This is confirmed by examining the connection between the individual standards of sociometric choice at the project task's beginning and end (table 2).

Table 2. Sociometric choice

SOCIAL EXPANSION				SOCIAL STATUS			
TASK	FRENDSHIP	TASK	FRENDSHIP	TASK	FRENDSHIP	TASK	FRENDSHIP
I exam.	II exam.	I exam.	II exam.	I exam.	II exam.	I exam.	II exam.
1	2	3	4	5	6	7	8
1.	1.00						
2.	.62*	1.00					
3.	.36	-.37	1.00				

4.	-.24	.56*	.67*	1.00			
5.	.13	-.17	.03	-.04	1.00		
6.	-.27	.23	.10	-.04	.56*	1.00	
7.	.09	-.04	.10	-.09	.56*	-.25	1.00
8.	-.01	.10	-.15	.22	-.28	.67*	.46

Based on these results, it can be concluded that the project task contributes to a better mutual acquaintance of the members (individuals) and their selection, given that individuals are valued more from the point of view of professional, "military" criteria. That high criticality and a greater focus on the military profession reduced the number of real choices in the second examination (social expansion).

4.1.2. THE RELATIONSHIP BETWEEN THE INDIVIDUAL CRITERIA OF SOCIOMETRIC SELECTION ON THE PROJECT TASK

The correlation between "socializing" and "task" at the beginning of the project is $p=0.36$, and at the end, $p=0.56$. This means that at the end of the project, the choice for both "socializing" and "task" is made according to more standard features than at the beginning of the project. The social status correlation coefficient (the number of choices obtained for each individual) in the two tests for the "project task" criterion is $p=0.56$, and for the "socializing" criterion, $p=0.46$. This means that higher reliability of responses is obtained in evaluating traits for "project task" than for "socializing". This finding can be interpreted according to the fact that for the institute's members, the qualities that are important for the execution of the project task are more specific and recognizable than those for socializing. The magnitude of the correlation coefficient for the social status index between these two criteria at the beginning of the project is $p=0.56$, and at the end, $p=0.67$. This means that for both criteria of sociometric selection, the number of common elements increases according to which the selection is made. At the end of the project, to a greater extent than at the beginning, the one who was a "good colleague" is also evaluated as a "good soldier" and vice versa.

4.2. RELATIONSHIP OF PERSONALITY CHARACTERISTICS WITH SOCIOMETRIC INDICATORS

4.2.1. CONATIVE PERSONALITY TRAITS AND SOCIOMETRIC INDICATORS

In this part of the research, a bipolar dimension was taken as a conative characteristic of project team members: directiveness - non-directiveness. Regarding this trait, no significant correlation with sociometric criteria (social expansion and social status) was obtained, which is confirmed by the results shown in Table 3.

Table 3. Sociometric indicators

Sociometric indicator	I EXAMINATION II EXAMINATION			
	Task	Socializing	Task	Socializing
group expansion	0.10	0.08	0.08	0.09
social status	0.03	0.12	0.04	0.10

4.2.2. THE RELATIONSHIP BETWEEN DIRECTIVENESS OF ATTITUDES AND SOCIOMETRIC INDICATORS

Also, no connection was established between the "directiveness of attitudes" and sociometric indicators within the institute, table 4. However, although the correlations are low and insignificant, it is interesting to point out that expansiveness positively correlates with directiveness in VGI and ISI and negatively in VTI. This would mean that VGI and ISI are more elected by those who want "control" over their group or team members, while the opposite applies to members of VTI.

Table 4. The relationship at the level of the institute

Sociometric indexes	Criterion "task"				Criterion "socializing"			
	VTI				VGI			
	The entire sample				The entire sample			
IGE	-.15	.19	.01	.10	-.17	.06	.01	.08
ISS	-.11	.12	.03	.03	-.04	.15	.10	.12

IGE = expansion group index ISS = social status index

However, when examining the connection between these two variables at the level of the department of the institute, several significant correlations were found, which is confirmed by the results in Table 5.

Table 5. The relationship at the level of the department

Criterion	Indexes	VTI			VGI			ISI		
		depart.			depart.			depart.		
		1	2	3	1	2	3	1	2	3
"Task"	IGE	-.09	.22	-.27	<u>-.56</u>	-.06	.14	<u>.45</u>	.24	.16
	ISS	-.05	-.22	-.05	-.06	-.25	-.21	-.08	-.02	.16
"Socializing"	IGE	-.13	<u>-.52</u>	-.31	<u>-.67</u>	.38	.07	.32	.13	.09
	ISS	.13	.07	-.03	-.15	-.16	-.23	-.01	-.02	<u>.33</u>

IGE = expansion group index ISS = social status index

Directivity is most often (negatively) associated with expansiveness in the third department - VTI and the first department of VGI, where there is an atmosphere of obedience, nonopposition, etc. Those who want to influence and control others choose fewer people for both "task" and "socializing". In addition, it is essential to note that negative correlation coefficients were obtained for the VGI and VTI departments and positive for members of the ISI department. Directivity in most departments correlates negatively with social status, meaning those who want to control and influence others are less prevalent in the group.

5. CONCLUSION

The obtained results show that the integrated-ness of the project teams did not increase at the end of the research project, as expected according to theories of interpersonal attraction. However, the correlation analysis showed that participation in the research project contributed to better mutual knowledge and the construction of valid criteria for assessing traits related to the sociometric selection criteria. During the research project, the individual is placed in new situations that allow him to get to know himself and others more realistically. In this respect, these sociometric indicators can be considered more objective than those obtained at the beginning of the project. This indicates that the research project, i.e. the project assignment, is a specific scientific and life situation that significantly requires different models of behaviour and evaluation of the members of the project team with the requirements of the military profession than in the so-called regular tasks of members of the institute.

Based on the examination of the connection between some conative and emotional personality traits of project team members with their social integration in the group, the following conclusions can be drawn: 1. regarding "directiveness of attitudes", as conative personality traits of project team members, no significant correlations were obtained with social expansion and social status concerning both criteria, neither in the entire sample nor within individual institutes; 2. directiveness is most often (negatively) associated with expansiveness in VTI and VGI, and positively within ISI. This personality trait in most groups negatively correlates with social status, which leads to the conclusion that those who want to influence others in the group are popular; 3. for both sociometric selection criteria, there is no general agreement on which personality traits determine the social status of an individual because a specific profile of desirable traits is formed in each group (team).

It is vital to recognize that project teams are not an impersonal groups and that team members should possess the skills required for the project and the quality of social integration that will contribute to the project's success.

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BIM FOR EFFECTIVE PROJECT MANAGEMENT DURING THE EXECUTION PHASE

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Abstract: Construction projects always involve a large number of participants, and managing a vast amount of information is necessary. Additionally, each project is unique, further complicating management challenges. Construction projects are exposed to a wide range of risks. These problems have been recognized, leading to the emergence of the need for new project management systems using information technology. The fundamental idea of Building Information Modeling (BIM) is to create a digital model of a building, which also serves as a centralized database to be used in all project lifecycle stages. This paper aims to present the achievements so far in the context of 4D and 5D BIM, demonstrating its capabilities through an example in the construction phase of a building.

Keywords: 4D BIM, 5D BIM, Construction Management, Planning, Cost

1. INTRODUCTION

Project management in large real-estate investments requires an extensive organizational resource base. Project management is continuously a very demanding job, since it is managing a large number of project stages and many teams from different disciplines that are involved in project implementation (designers, subcontractors, equipment suppliers, material suppliers, consultants, etc.).

Project management requires interdisciplinary knowledge. Designing projects and creating technical documentation are the most complex activities because these processes are pathways from an idea to the beginning of building construction. The modern approach to project management is based on information technologies that provide an integrated work concept, an integration of all phases of building development, from an idea to the design, construction and maintenance of the facility.

Not so long ago, project management in building construction was a significantly more difficult process. Designs and management schemes were created manually, hand drawn on paper, which required a lot of time. Also storing this technical documentation required large infrastructure (spaces). Since different involved disciplines required different kinds of drawings, adjustment of one to another and coordination in-between required a lot of back and forward communication processes. It often resulted in a lack of accuracy and many disharmonized details. During the implementation (construction) of the building design, these problems stood out, not only because of the problems mentioned above, but also because of the lack of its understanding.

The progress of information technologies has significantly changed many industries, among them the construction industry. Computer-aided drawing, such as well-known AutoCad software, appeared during the 1990s, but many problems remained the same. Certain progress was obvious, drawing speed improved, speed of revisions and changes in design, easier checks to see if the drawings are consistent,... Although today it doesn't seem like it,

this was a significant improvement. With upgrades of these solutions, 3D modeling was introduced. It offered new possibilities in design and in projects. Technical documentation (floor plans and cross-sections) is extracted from the 3D model, thereby shortening the design time and facilitating the process of harmonizing different projects.

New challenges appeared in information technology in construction after the introduction of the 3D model. It was challenging to upgrade 3D models in n-dimensional space including 4D, 5D, 6D,... Modeling started from 3D where it is possible to assign additional information to the geometry, from defining the category of the element (column, window, door) to its characteristics, functions and properties. After that, the model is expanded by assigning the duration of certain activities and linking them to the schedule, which results in 4D. Upgrading the model with a financial plan leads us to 5D, the energy efficiency of the building in exploitation leads us to 6D, maintenance of the building in the exploitation period to 7D,... This is the basic idea behind the creation of the Building Information Model (BIM), which is continuously developing.

The goal is that BIM contains all the necessary information about the building, that is, to be a centralized database of a building, and to perform all the necessary analyses and extract all the necessary information within its framework, and as such provides excellent conditions for project management from conception to demolition.

Given that the benefits of using 3D BIM have already been recognized and a large number of construction companies use it for the creation of project documentation (floor plans, sections, and quantity take-off), the focus of this paper is to point out the benefits brought by the fourth and fifth dimensions of BIM, in order to get the most out of it.

2. BIM USE IN THE CONSTRUCTION PHASE

Time and costs are important for all participants during the implementation of the project, which is why in order for the construction project to be successful, it is necessary to make adequate schedules and financial plans. Well-known schedule planning methods are: network plan, Gantt chart and line of balance, while for cost control, cash flow and Earned Value Method (EVM) are used. Because of the importance of these analyses and plans, BIM has a time dimension (4D) (Martins et al., 2022) and a cost dimension (5D) (Abdel-Hamid & Abdelhaleem, 2017; Mukkavaara et al., 2016; Smith, 2016).

2.1. DIMENSION OF TIME (4D BIM)

Software such as Microsoft Project, Primavera, etc. are often used for the creation of schedule plans. The difficulties that occur when using only this software are strongly related to the individual operation of the building design software and the schedule design software, without the possibility to update new project data, which may arise during the execution phase, simultaneously in both software, after changes have been made. Also, in the before mentioned schedule design software, in order to clearly define the tasks, in addition to naming and describing them, it is usually necessary to create additional sketches, after which there may be omissions. 4D BIM integrates these existing approaches by creating schedule plans and adds the ability to link them to the 3D model (spatial dimension of the building) and thus overcomes these problems.

It is also necessary to mention the possibility of generating an animation or simulation of building construction, which, in addition to its commercial capabilities, provides the planner

with an additional tool for checking the quality of the schedule plan. In this way, the planner can immediately see if the tasks, their connections and dependencies are well set, and if the construction order of the schedule plan is correct.

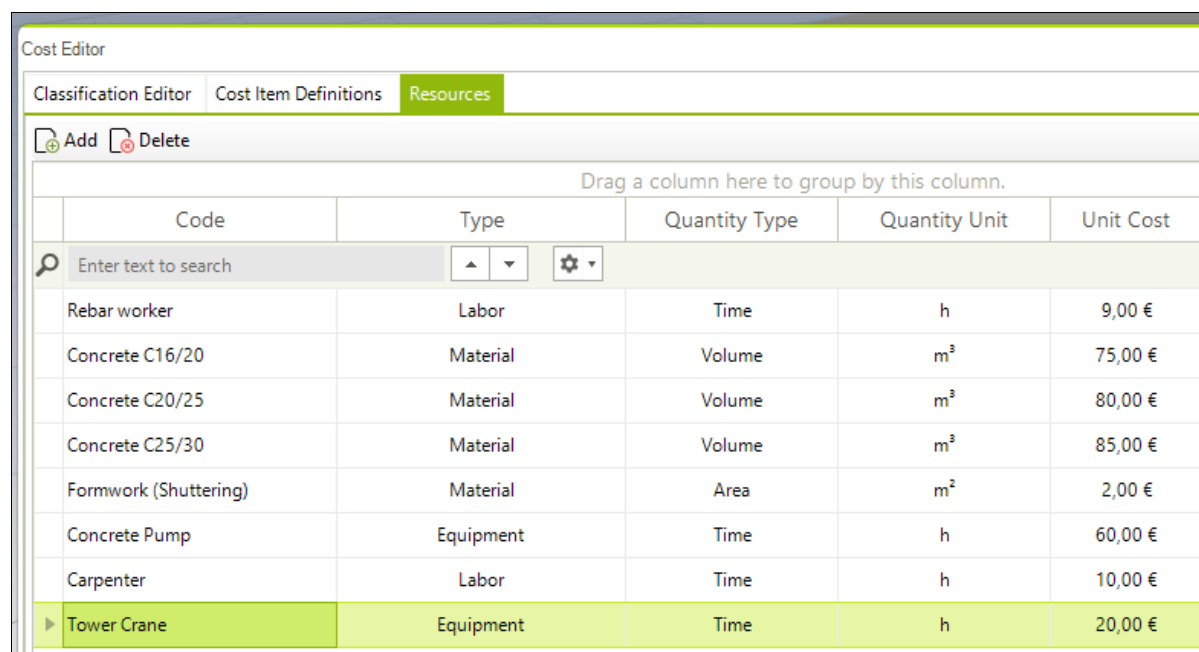
2.2. COST DIMENSION (5D BIM)

Reviewing project costs is one of the most important analyses of construction projects. In order for the contractor to be able to form his prices, the contractor needs to look at the direct and indirect costs of the project, as well as the scope of work. Construction projects are complex and have a large number of work positions, and therefore it is necessary to carry out this analysis in a systematic way in order to achieve the highest possible accuracy. The fifth dimension of BIM provides the tools for the contractor to create his own project control, that is, to create his Quantity take-off based on the existing 3D model and then, similar to the fourth dimension, to define the costs and assign them to the appropriate elements.

2.3. ANALYSIS OF 4D AND 5D BIM WITH EXAMPLES

Now certain possibilities which are offered by 4D and 5D BIM will be analyzed and presented through Bexel Manager software (Bexel Consulting, 2023).

At the beginning, we can define all the necessary resources within the project, which will later be needed for the execution of our tasks within the schedule, with their unit cost per unit of measurement (Figure 1).



Code	Type	Quantity Type	Quantity Unit	Unit Cost
Rebar worker	Labor	Time	h	9,00 €
Concrete C16/20	Material	Volume	m ³	75,00 €
Concrete C20/25	Material	Volume	m ³	80,00 €
Concrete C25/30	Material	Volume	m ³	85,00 €
Formwork (Shuttering)	Material	Area	m ²	2,00 €
Concrete Pump	Equipment	Time	h	60,00 €
Carpenter	Labor	Time	h	10,00 €
▶ Tower Crane	Equipment	Time	h	20,00 €

Figure 1. Defining resources

Then, for each type of work, the resources required for its execution are selected from the previous database (Figure 1), and the average quantity of resources required to complete a single unit of measurement for the work is defined (Figure 2).

Cost Item Editor

Code: Slabs [20cm]

Name: Slabs [20cm]

Description:

General Resources Mappings

+ Add X Remove

Drag a column here to group by this column.

	Code	Resource Type	Quantity	Quantity Type	Quantity Unit	Waste Factor	Unit Cost
	Formwork (Shutteri...	Material	5	Area	m ²	0.00%	2,00 €
	Concrete C25/30	Material	1	Volume	m ³	3.00%	85,00 €
	Rebar worker	Labor	0.8	Time	h	0.00%	9,00 €
	Carpenter	Labor	0.8	Time	h	0.00%	10,00 €
	Concrete Pump	Equipment	0.01	Time	h	0.00%	60,00 €
	Tower Crane	Equipment	0.10	Time	h	0.00%	20,00 €

Figure 2. Adding resources to types of works

This way, we have defined the cost of this item per unit of measure - "Unit Cost" (Figure 3). It is also possible to add other costs that are not expressed through a specific resource: "Subcontractor Cost", "Other Cost",... (Figure 3). Costs should always be defined through resources if possible, so they can be used later for further analysis (Figure 6 and Figure 7).

Cost Item Editor

Code: Slabs [20cm]

Name: Slabs [20cm]

Description:

General Resources Mappings

Daily Output: 1.000

Quantity Type: Volume

Quantity Unit: m³

Unit Cost: 115,43 €

Material Supplement Cost: 0.00

Labor Supplement Cost: 0.00

Equipment Supplement Cost: 0.00

Other Cost: 0.00

Subcontractor Cost: 0.00

Figure 3. Defining unit costs for types of works

This can now be linked to the elements of the 3D model and its geometry, through which the cost estimate is calculated (Figure 4).

Name	Quantity	Unit	Unit Cost	Material Cost	Labor Cost	Equipment Cost	Base Construction Cost
Enter text to search							
Classification				89.199,91 €	13.943,58 €	2.591,95 €	105.735,44 €
Types of works				89.199,91 €	13.943,58 €	2.591,95 €	105.735,44 €
Reinforced concrete works - Reinforced concrete works				89.199,91 €	13.943,58 €	2.591,95 €	105.735,44 €
Beams - Beams				9.757,40 €	1.519,15 €	259,85 €	11.536,40 €
Beams 25x40 - Beams 25x40	99.944	m³	115,43 €	9.757,40 €	1.519,15 €	259,85 €	11.536,40 €
Columns - Columns				989,51 €	204,25 €	215,00 €	1.408,76 €
Columns [25x25cm] - Columns [25x25cm]	10.750	m³	131,05 €	989,51 €	204,25 €	215,00 €	1.408,76 €
Foundations - Foundations				158,59 €	30,40 €	32,00 €	220,99 €
Footings [50x50cm] - Footings [50x50cm]	1.600	m³	138,12 €	158,59 €	30,40 €	32,00 €	220,99 €
Slabs - Slabs				78.294,40 €	12.189,79 €	2.085,09 €	92.569,28 €
Slabs [20cm] - Slabs [20cm]	801.960	m³	115,43 €	78.294,40 €	12.189,79 €	2.085,09 €	92.569,28 €

Figure 4. Cost Estimate

Now we can read this information from the model itself (Figure 5). It is also important to note that if we decide to make a change about a resource (for example add or remove a resource), our cost estimate will be updated.

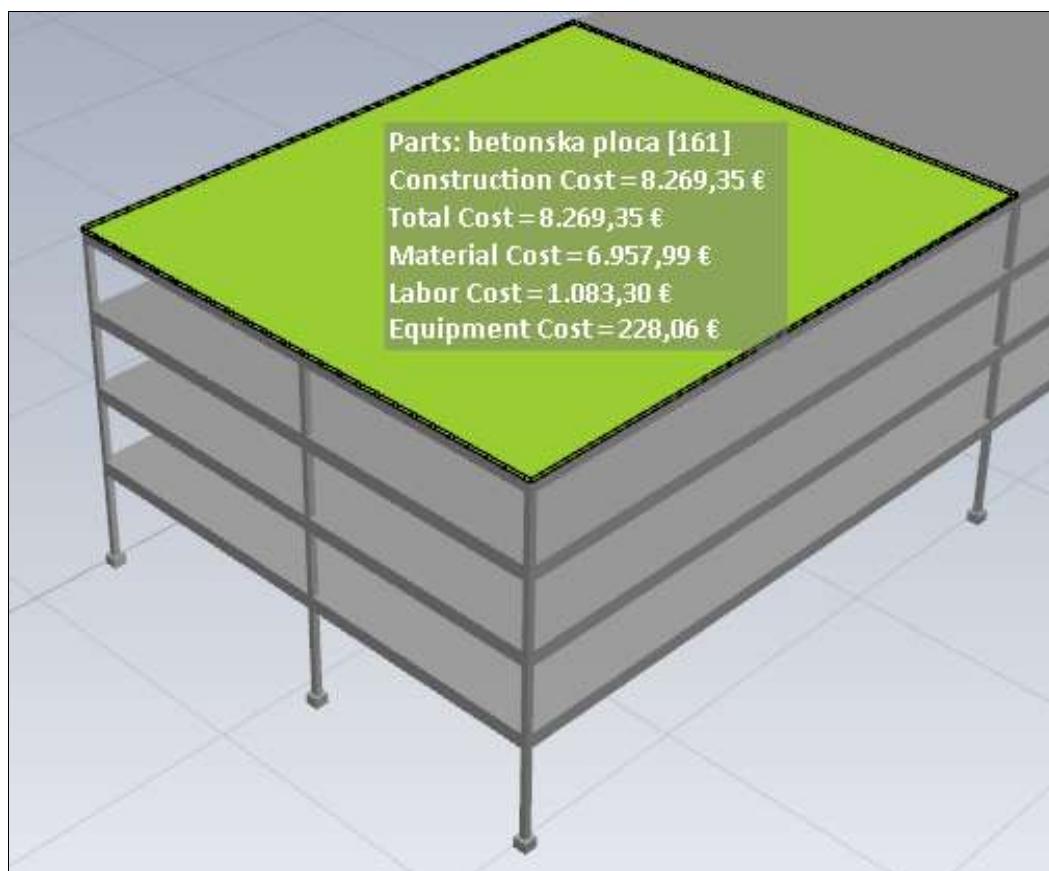


Figure 5. Preview of cost estimate on the 3D model

Here we can already highlight certain advantages of this approach, and they appear in the process of creating the schedule. The schedule consists of tasks, and by assigning elements from the 3D model to those tasks, we have a cost estimate for that task and the quantity of required resources.

Depending on the duration of the task, the resource requirements change. In order to be able to create a precise schedule, it is necessary to make an adequate resource allocation. Figures 6 and 7 show the required quantity of resources for the same task. In Figure 6 the task lasts 5 days, while in Figure 7 the task lasts 4 days. Analyzing only the carpenters, we can see in Figure 6 that we need an average of 1.14 carpenters to complete this task by the planned deadline. If one worker were to be adopted, there would be two outcomes: either the worker would have to achieve 14% higher performance within the work shift or he would have to work longer. In Figure 7, we have an average of 1.45 and we can ask the question, of whether to adopt one or two workers. In a similar way, we can look at other resources and make certain decisions.

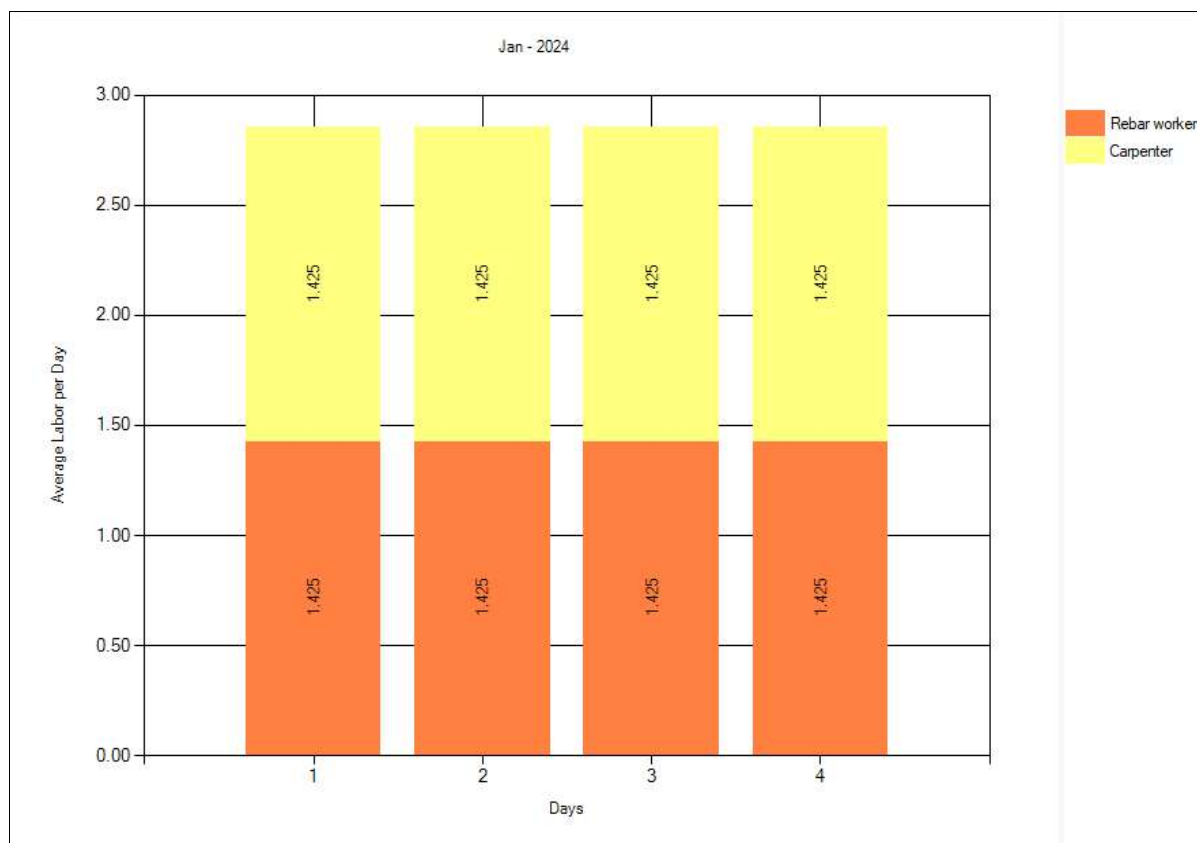


Figure 6. Required labor for the task that lasts 5 days

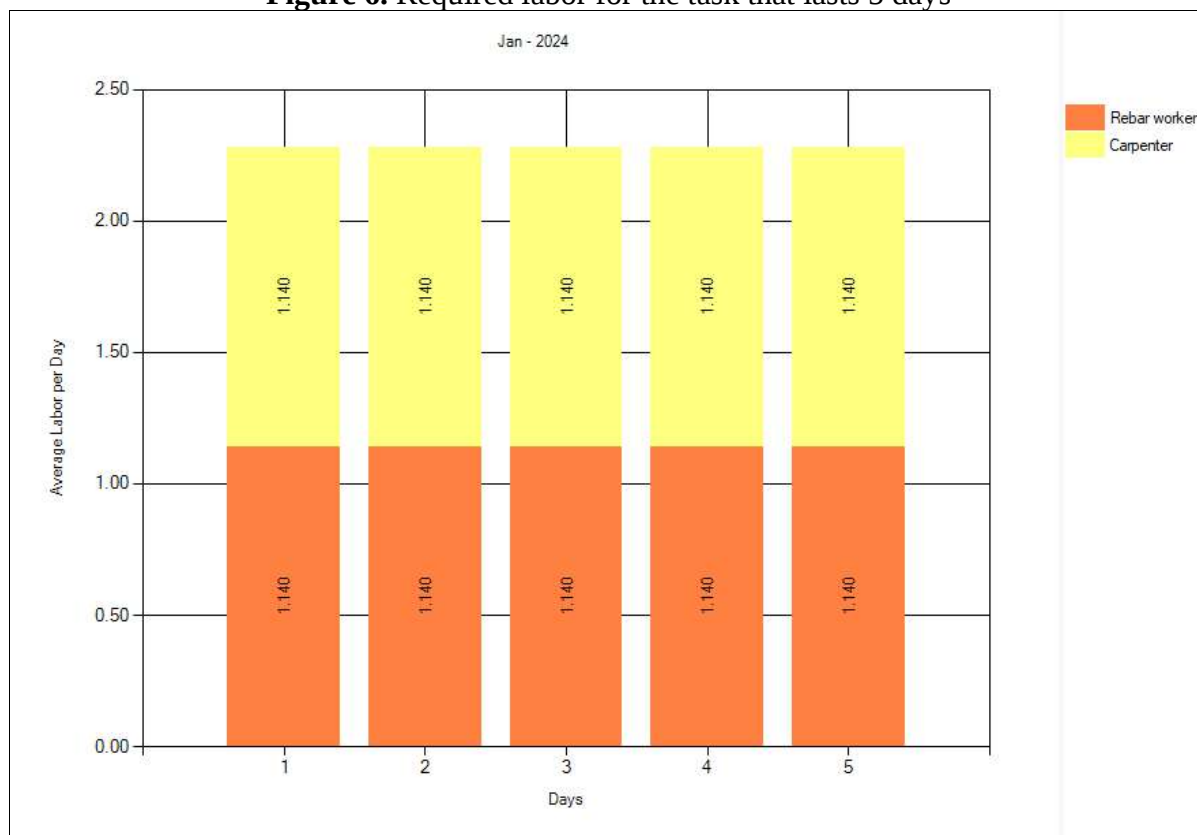


Figure 7. Required labor for the task that lasts 4 days

Finally, once the construction on site begins, the progress can be tracked by selecting and marking elements from the model which were executed, with adding additional information

about the actual quantities and costs. Based on this data, work trends can be established and monitored through the Earned Value Method (EVM).

3. CONCLUSION

In the end, it can be concluded that BIM brings numerous advantages to construction management due to the well-organized structure of data, and because of that it is easier to make cost and time optimizations among others. Also, errors can be found more easily and eliminated faster. The use of BIM in all phases of the project's life cycle brings a comprehensive approach, where 4D and 5D give greater control over the project during the execution phase.

The obvious advantages are:

- The comprehensiveness of the virtual model, which describes the project in detail, including geometry, materials, costs, planned time for its completion...
- more effective collaboration and communication of the participants on the project due to easy access to information which allows us to minimize errors,
- the possibility of thorough analysis and simulations of the project, both before and during the execution phase,
- cost optimization possibilities and easy monitoring of costs during construction.

Finally, BIM has significant advantages over traditional design and planning methods and has proven to be a necessary tool for modern and efficient construction management.

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PLANIRANJE, KONTROLA I UPRAVLJANJE PROMENAMA U JEDNOJ SOFTVERSKOJ APLIKACIJI

PLANNING, CONTROL AND CHANGE MANAGEMENT IN A SINGLE SOFTWARE APP

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Apstrakt: Građevinski projekti ne ispunjavaju ciljeve i opterećeni su problemima u realizaciji. Upravljanje projektima može se unaprediti razvojem objedinjujućih aplikacija. Najbolje putem sinergije nauke i prakse, koristeći fondove za finansiranje inovacija koji multidisciplinarnim pristupom osiguravaju usklađenost naučnih ideja sa potrebama tržišta. U radu je prikazan razvoj jedinstvene aplikacije za planiranje, kontrolu i upravljanje promenama za projekte izgradnje poslovno-stambenih objekata iz ugla investitora, uz pomoć dva programa Inovacionog fonda RS. Problem u praksi je komplikovano upravljanje promenama izazvano informatičkom nepovezanošću planiranja, normiranja i finansijskih proračuna. Predloženo rešenje je objedinjujuća aplikacija za upravljanje mesečnim promenama realizacije, dinamike i priliva/odliva, bazirana na „finansijski kvantifikovanom gantogramu“ sa kumulativnim cashflow-om kao kontrolnom merom. Program Dokaz koncepta omogućio je razvoj demo verzije aplikacije. Kao obavezan deo programa, istraživanje tržišta je ukazalo na neophodnost kreiranja posebnog modula za planiranje sa mogućnošću automatskog kreiranja inicijalnog dinamičkog plana u formi „finansijski kvantifikovanog gantograma“. Nastavak razvoja je sproveden kroz program Transfer tehnologije. Modul za planiranje omogućava sagledavanje gabarita objekta, dinamike, troškova i rizika, koristeći samo podatke iz Informacije o lokaciji. Za automatsko kreiranje inicijalnog dinamičkog plana osmišljen je „univerzalni ritmični ciklogram“ na nivou glavnih tokova koji je određen trajanjem prvog toka i vremenskim zazorima.

Ključne reči: upravljanje projektima, finansijski kvantifikovan gantogram, univerzalni ritmični ciklogram

Abstract: Construction projects do not meet goals and have implementation problems. Unifying apps can improve project management. Preferably through science&practice synergy, using innovation financing funds that, with a multidisciplinary approach, ensure the alignment of scientific ideas with market needs. This paper presents the development of a unifying app for planning, control and change management for residential projects from the owner's perspective, using two RS Innovation Fund programs. The problem in practice is complicated change management caused by the information disunity of planning, norming and financial calculations. The proposed solution is a unifying app for managing monthly changes in performance, schedule and inflows/outflows based on a "Financially Quantified Gantt Chart" with cumulative cash flow as a control measure. The Proof of Concept program enabled the development of a demo app. Mandatory market research indicated a need for a separate planning module with a feature for creating an automatic initial schedule for the "Financially Quantified Gantt Chart". The development continued through the Technology Transfer program. The planning module estimates building dimensions, schedule, costs and risks using only data from the Location Information. For automated scheduling, a "Universal Rhythmical Line of Balance" was designed at the main flow level, determined by the durations of the first flow and buffers.

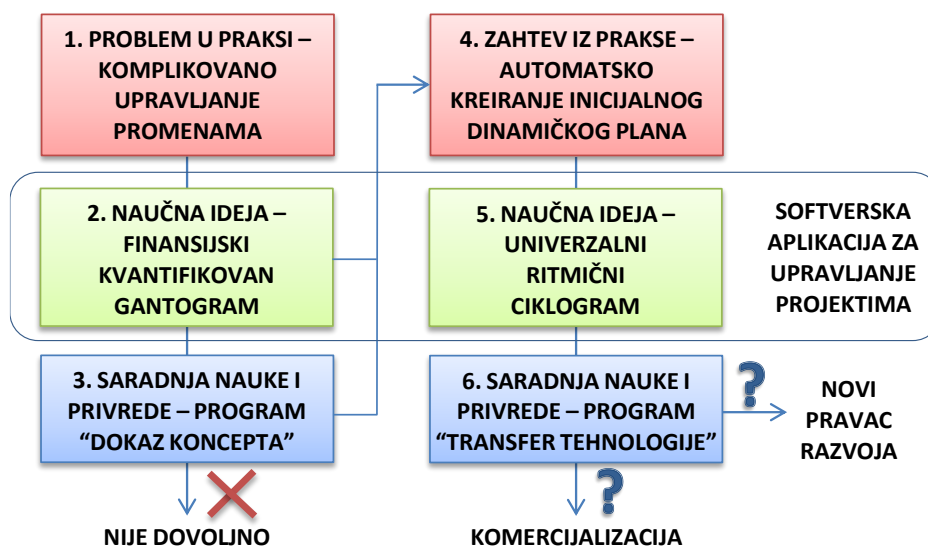
Keywords: Project Management, Financially Quantified Gant Chart, Universal Rhythmical Line of Balance

1. UVOD

Građevinski projekti ne ispunjavaju ciljeve i opterećeni su problemima u realizaciji. Upravljanje projektima treba da se podigne na viši nivo, najbolje kroz sinergiju nauke i prakse. Praksa ne poznaje dovoljno dostignuća u nauci, ali je možda razvila specifične alate koji poseduju naučni potencijal. Nauka je često odvojena od prakse jer, nažalost, objavljivanje radova ne podrazumeva njihovu primenljivost. Istraživači često zanemaruju praktična pitanja u vezi komercijalizacije i tržišta pa istraživanja ne napuste akademsko okruženje. Praksa i nauka se teško prepoznaju čak i kad praksa želi naučni razvoj. Najbolja šansa za saradnju nauke i prakse su naučni fondovi koji, osim finansiranja, daju strukturu idejama i nameću istraživačima multidisciplinarnost (intelektualna svojina, istraživanje tržišta, promocija, marketing, komercijalizacija) koja obezbeđuje usklađivanje naučnih ideja i zahteva tržišta. U ovom radu prikazaće se primer saradnje nauke i privrede na razvoju aplikacije za upravljanje projektima, uz pomoć programa „Dokaz koncepta“ i „Transfer tehnologije“ Inovacionog fonda republike Srbije.

2. RAZVOJ APLIKACIJE ZA PLANIRANJE, KONTROLU I UPRAVLJANJE PROMENAMA

Na Slici 1 prikazani su koraci u razvoju aplikacije za upravljanje projektima koja obuhvata planiranje, kontrolu i upravljanje promenama.



Slika 1. Koraci u razvoju aplikacije za upravljanje projektima

Problem koji su autori susreli u praksi je komplikovano upravljanje promenama na nivou mesečne realizacije projekata iz ugla investitora. Naučna ideja za rešenje problema je uvođenje „finansijски kvantifikovanih gantograma“ (FKG), pomoću kojih se na jednom mestu mogu pratiti promene u nivou realizacije, dinamike i plaćanja sa kumulativnim cashlow-om kao kontrolnom merom. Program Dokaz koncepta Inovacionog fonda RS je omogućio razvoj demo verzije aplikacije. Kao obavezan deo programa, istraživanje tržišta je ukazalo na neophodnost novog pravca razvoja – korisnici su zahtevali automatsko kreiranje

inicijalnog dinamičkog plana da bi koristili FKG. Uspešno apliciranje na program Transfer tehnologije omogućilo je softverski razvoj modula za planiranje na bazi druge naučne ideje - „univerzalnog ritmičnog ciklograma“ (URC). Program predviđa kontakte sa potencijalnim partnerima za komercijalizaciju – korak koji će pokazati da li je aplikacija spremna za tržište ili je potrebno još rada na njoj. U narednim poglavljima navedeni koraci sa Slike 1 biće objašnjeni detaljnije.

2.1 PROBLEM U PRAKSI – KOMPLIKOVANO UPRAVLJANJE PROMENAMA

Realizacija građevinskih projekata se često ne odvija po planu i prema ugovoru. Važnost upravljanja promenama je prepoznata u literaturi zajedno sa preprekama za širu primenu (Hwang & Low, 2012). Uticaj promena u dinamici i troškovima na cashflow je od presudne važnosti za uspeh na projektima, pa je i modeliranje S krive u fokusu istraživanja (Zayed & Liu, 2014), (Ostojić-Škomrlj & Radujković, 2012) i (Konior & Szóstak, 2020). Nerazrešene promene često završe skupim i dugotrajnim odštetnim zahtevima (Stojadinović, 2018).

Jedan od osnovnih problema u ovoj oblasti je razdvojenost planiranja, normiranja, ugovaranja i cashflow-a, jer se sprovode u odvojenim aplikacijama i programima. Tradicionalan pristup planiranju i kontroli ne omogućava kvalitetnu vezu između dinamike realizacije i dinamike plaćanja, kao ni efikasno upravljanje poremećajima u realizaciji. Ispitivanje promena u dinamici je izvodljivo u programima za planiranje (Project, Primavera), ali upravljanje novčanim tokovima ne funkcioniše dobro. U Project-u, cashflow je izveštaj koji ne može da se edituje i ne uključuje prilive. Project nudi tri načina povezivanja novca sa aktivnostima: na početku, završetku i uniformno raspodeljeno tokom trajanja. Ali cashflow se u praksi dešava sasvim drugačije – prilivi i odlivi se dešavaju pre, za vreme i nakon završetka aktivnosti. Jedan od načina da se prevaziđe problem je uvođenje posebnih aktivnosti samo za isplate, ali se na taj način broj aktivnosti povećava sa stotina na hiljade, a takvim planovima se teško upravlja. Postoji mogućnost izvoza podataka u Excel i nazad ali je to komplikovano i zahtevno. Izmenama je teško upravljati, jer se mora u svim aplikacijama intervenisati “u krug”, za šta se mora angažovati stručan tim.

Ovakva situacija na građevinskim projektima motivisala je autore da kreiraju novu metodologiju i jedinstvenu aplikaciju za upravljanje promenama koja sadrži sve neophodne podatke u prikladnom obliku. Cilj je pojednostaviti proceduru, omogućiti ispitivanje scenarija u vezi preostale realizacije i smanjiti obim posla i utrošak vremena na koordinaciji realizacije na mesečnim presecima. Pojednostavljenje procedura je u duhu savremenog pristupa upravljanju projektima - Lean koncepta, koji podrazumeva “minimiziranje utroška resursa u cilju generisanja maksimalne vrednosti” (Koskela in (Forbes & Ahmed, 2020))

2.2 NAUČNA IDEJA – FINANSIJSKI KVANTIFIKOVAN GANTOGRAM

Predložena metodologija je namenjena projektima izgradnje stambeno-poslovnih objekata iz ugla investitora ali je moguće primeniti i na drugim projektima. Metodologija podrazumeva redukovani broj aktivnosti, mesečnu vremensku skalu i definisanje realizacije i plaćanja za svaku aktivnost preko mesečnih procenata. Broj aktivnosti se redukuje na vrste radova, odnosno na glavni WBS nivo detaljnih planova, koji najčešće odgovara i strukturi ugovornih paketa. Predložena vremenska skala je mesečna jer su vremenski preseki (progres, situacije) mesečni na skoro svim građevinskim projektima. Na taj način broj aktivnosti se smanjuje desetak puta u odnosu na detaljne planove, pa se predložena struktura sastoji od tridesetak aktivnosti. Svaka aktivnost se predstavlja tabelarno u dva reda preko mesečnih procenata po

kolonama. U prvom redu se definiše dinamika realizacije a u drugom dinamika plaćanja. Za definisani iznos aktivnosti formira se cashflow odliva i priliva. Kumulativni cashflow predstavlja meru finansijske održivosti projekta (pozitivne vrednosti za svaki mesec) potrebnu investitoru da bi planirao i kontrolisao realizaciju projekata uključujući neminovne promene.

Ovaj način prezentacije, prikazan na Slici 2, može se nazvati “finansijski kvantifikovan gantogram” jer polja sa procentima realizacije i plaćanja vizuelno čine gantogram sa mesečnom vremenskom skalom. Hipoteza je da je ovakav način definisanja aktivnosti dovoljno detaljan za planiranje i kontrolu realizacije iz ugla investitora. Ostvareni mesečni procenti realizacije omogućavaju lako poređenje sa planom, povezujući tako realizaciju, promene i cashflow. Upravljanje promenama se svodi na preraspodelu mesečnih procenata realizacije na preostale mesece direktno u aplikaciji.

	Cena	Kontrola	Februar	Mart	April	Maj	Jun	Jul
Dinamika realizacije	150.000€	100%		15%	35%	30%	20%	
Dinamika plaćanja	150.000€	100%	20%			60%		20%

Slika 2. Finansijski kvantifikovan gantogram

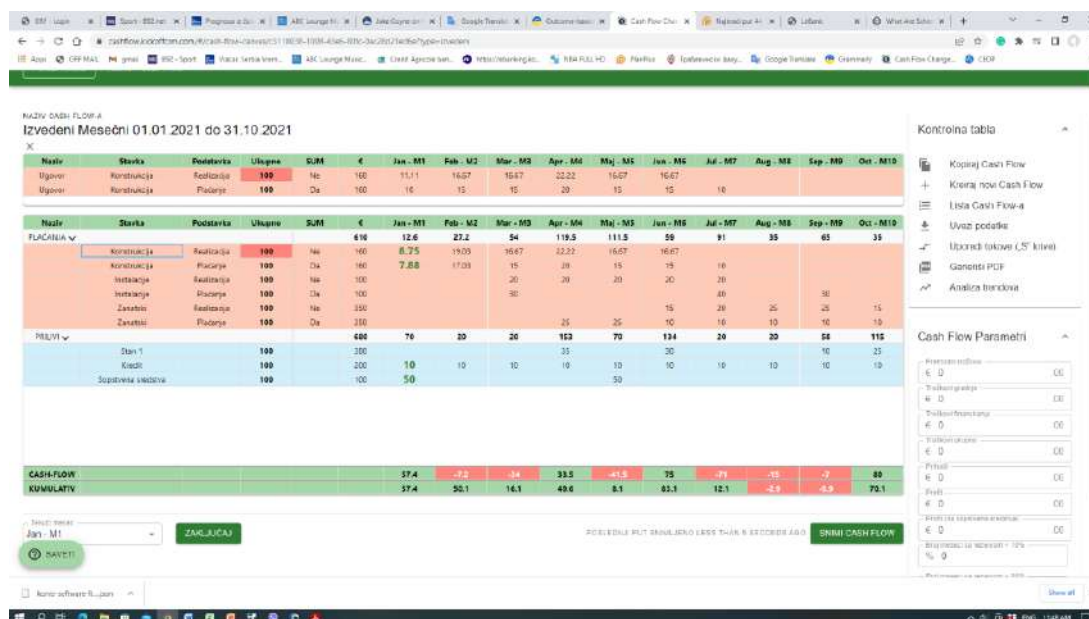
Metodologija finansijski kvantifikovanih gantograma omogućava upravljanje izmenama na jednostavan način, ali zahteva kreiranje softverske aplikacije.

2.3 SARADNJA NAUKE I PRIVREDE – PROGRAM “DOKAZ KONCEPTA”

U prethodna dva poglavlja objašnjen je problem koji postoji u praksi, kao i ideja za prevazilaženje tog problema. Međutim, s obzirom da rešavanje problema zahteva značajna finansijska sredstva za kreiranje softverske aplikacije, kao i malu verovatnoću da se budući korisnici aplikacije i autori ideje sami prepoznaju i organizuju na zajedničkom poslu, vrlo je verovatno da se ništa neće desiti bez pomoći “treće strane”.

Najrealnija opcija za prevazilaženje ove situacije je korišćenje naučnih investicionih fondova. Različite institucije kao što su Ministarstvo nauke, Investicioni fond RS ili Naled, redovno raspisuju konkurse za dodelu sredstava za razvoj i inovaciju prakse finansiranjem naučnih ideja u najširem smislu. Dobijanje sredstava na otvorenim konkursima nije lako i zahteva od autora ozbiljan rad na pripremi predloga uz neizvesnost uspešnog ishoda. Potreban je i kvalitetan naučni odbor koji je sposoban da prepozna pravu ideju, što je teško obezbediti zbog raznolikosti ideja i nemogućnosti da evaluatori poznaju detalje različitih struka. Zato fondovi često koriste strane eksperte koji su iskusni da prepoznaju komercijalni potencijal naučnih predloga. Za finalni rezultat je posebno važno što programi finansiranja podrazumevaju multidisciplinarni pristup i određene aktivnosti mimo same ideje. Autorima, koji često nemaju sluha za operativnu primenu iz ugla korisnika, se nameće da se bave istraživanjem tržišta, promocijom, marketingom, komercijalizacijom i zaštitom intelektualne svojine, povećavajući tako šanse za implementaciju projekata u praksi.

U ovom slučaju autori su uspešno aplicirali za program Dokaz koncepta Inovacionog fonda RS. Dobijena su sredstva za softverski razvoj i proveru isplativosti i primenljivosti predložene ideje u praksi. Kreirana je demo verzije aplikacije, prikazana na Slici 3, na kojoj se mogu uočiti dinamika plaćanja realizacije i dinamika priliva u formi FKG. U donjem delu ekranu je kumulativni mesečni cashflow.



Slika 3. Demo verzija aplikacije

Kao obavezan deo programa, usledilo je istraživanje tržišta anketiranjem učesnika nakon prezentacije. Ankete su pokazale da postoji interes za aplikacijom i da je ona dobro dizajnirana, ali da postoji potreba za nadogradnjom softvera. Projekat je uspešno zatvoren sa idejom da se u sledećoj fazi demo verzija unapredi uvođenjem nove funkcionalnosti u skladu sa zahtevima tržišta.

2.4 ZAHTEV IZ PRAKSE – AUTOMATSKI INICIJALNI DINAMIČKI PLAN

Demo verzija predviđa da se dinamika slobodno formira definisanjem aktivnosti – naziv, iznos i mesečni procenti za realizaciju i plaćanje. Ali pokazalo se da korisnici nisu imali ideju kako da to urade na prihvatljivo dobar način, osim da dinamiku urade u MS Projectu pa da je „ručno“ pretvore u mesečne procenete.

Ovo svakako nije racionalan pristup i predstavlja ozbiljan nedostatak aplikacije, nastao previdom autora kome zbog iskustva nije bio problem da preraspodeli procenete u slobodnoj formi. Zato se nametnuo zahtev da se napravi poseban modul za planiranje sa specijalnom metodologijom za automatsko formiranje inicijalnog rasporeda mesečnih procenata. Međutim, ovaj zahtev je pred autore postavio ozbiljan naučni izazov izvan okvira samog programa – da li je moguće automatizovati izradu dinamičkog plana na zadovoljavajući način?

2.5 NAUČNA IDEJA – UNIVERZALNI RITMIČNI CIKLOGRAM

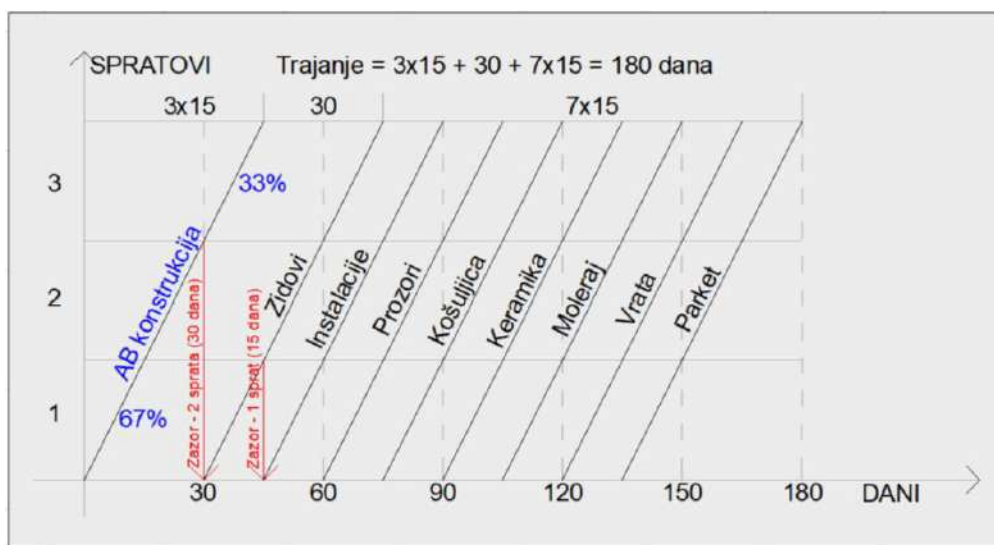
Pre izrade automatskog dinamičkog plana neophodno je sagledati postojeće nivoe planiranja i potrebe investitora po tom pitanju. Na građevinskim projektima postoje tri nivoa planiranja:

- Master planiranje služi da se inicijalno sagleda projekat, sadrži desetak aktivnosti, bez posebne metodologije izrade, najčešće tabelarno.
- Nivo detaljnog planiranja podrazumeva sagledavanje svih vrsta radova po svim lokacijama (WBS i LBS), normiranje i dodelu resursa aktivnostima. Ovaj nivo planiranja rade izvođači prilikom pripreme ponude na tenderu u specijalizovanim softverima kao što su MS Project ili Primavera..

- U fazi realizacije izvođači detaljne planove razrađuju na nedeljni i dnevni nivo, koristeći posebne metodologije kao što su Last Planner (Forbes & Ahmed, 2020) ili Work Cycle Scheduling (Marinkovic, et al., 2013).

Investitorovim potrebama ne odgovara nijedan od ovih nivoa. Master plan nije dovoljan a detaljni i operativni su previše detaljni. Investitorima zapravo najviše odgovara predložena struktura za FKG. Osim toga, nijedan od ovih nivoa planiranja nije moguće automatizovati u opštem smislu – nije moguće formirati spisak aktivnosti i nije moguće normirati zbog nepoznatih količina. Ali, za određeni tip projekta, moguće je sagledati aktivnosti na glavnom WBS nivou. Za stambeno poslovne-objekte to su glavni tokovi koji se ponavljaju na svakoj zgradi (od AB radova do parketa). Hipoteza je da se, na nivou vrsta radova, može direktno kreirati “univerzalni ritmični ciklogram” zato što se glavne vrste radova ponavljaju istim redosledom na svim zgradama.

Na Slici 4 prikazan je deo predloženog URC-a, koji podrazumeva ista trajanja za sve vrste radova. Da bi se kreirao ritmični ciklogram potrebno je odrediti trajanje samo prvog toka na tipskom spratu i vremenske zatore za početak narednih tokova. U slučaju zgrada prvi tok su AB radovi. Uobičajeno je da nakon izrade dve etaže počnu zidarski radovi, dok je zazor između zanatsko-završnih radova jedna etaža. Trajanje AB radova na tipskom spratu može se odrediti empirijski prema površini etaže. Podelom sprata na taktove postiže se paralelizacija radova i slično trajanje na spratovima manje i veće površine. Ukupno trajanje izgradnje određeno je brojem spratova, trajanjem AB radova na jednoj etaži i brojem tokova.



Slika 4. Univerzalni ritmični ciklogram

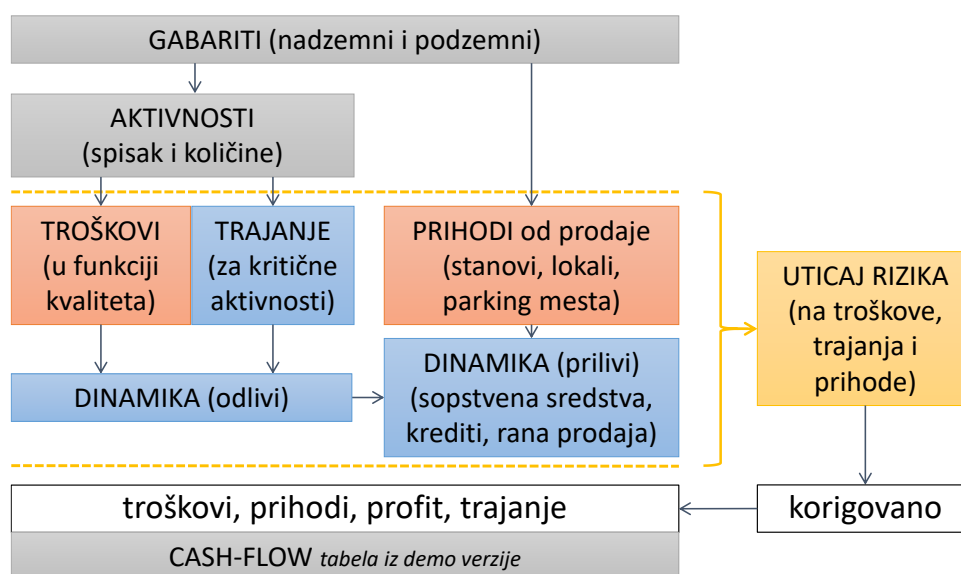
Na primer, ako na petospratnoj zgradi trajanje AB radova na jednoj etaži iznosi 12 dana, onda je za 9 tokova ukupno trajanje $5 \cdot 12 + 9 \cdot 12 = 168$ dana. Ovo je dovoljno tačno za inicijalni plan koji se kreira na samom početku projekta, pre izrade bilo kakve projektne dokumentacije. Iz Informacije o lokaciji su dostupni gabariti objekta što je dovoljno za kreiranje URC-a. Detaljna dinamika ionako nije poznata pre tendera i ponuda izvođača.

Da bi se URC pretvorio u FKG, nakon kreiranja ciklograma, preostaje preračunavanje mesečnih procenata realizacije (uz datum početka gradnje), definisanje dinamike plaćanja i priliva i formiranje cashflow-a. Ova procedura ne može i ne treba da zameni detaljno dinamičko planiranje koje izvođači rade prilikom izrade ponude, ali je dovoljno dobra iz ugla

investitora, kako za planiranje tako i za kontrolu realizacije. Metodologija FKG se može primeniti na svim građevinskim projektima dok je URC osmišljen za projekte izgradnje stambeno-poslovnih objekata.

2.6. SARADNJA NAUKE I PRIVREDE – PROGRAM “TRANSFER TEHNOLOGIJE”

Nakon uspešno završenog programa Dokaz koncepta, autori su uspešno aplicirali za program Transfer tehnologije Investicionog fonda RS. Ovaj program je namenjen komercijalizaciji pa, osim razvoja softvera, podrazumeva kreiranje promotivnih materijala i uspostavljanje kontakta sa potencijalnim partnerima za komercijalizaciju. Program je trenutno u svom drugom kvartalu u fazi nadogradnje demo verzije softvera razvojem modula za planiranje, koji je šematski prikazan na Slici 5.



Slika 5. Šematski prikaz modula za planiranje

Osim automatskog kreiranja inicijalnog dinamičkog na plana (na slici „dinamika odlivi“), novi modul aplikacije za planiranje sagledava i druge parametre objekta i projekta, i to samo na osnovu nekoliko podataka koji se sadrže u Informaciji o lokaciji – lako dostupnom dokumentu za svaku parcelu:

- Nadzemni gabariti objekta (broj i neto/bruto površine spratova),
- Podzemni gabariti objekta (sa mogućnošću ispitivanja različitih varijanti vertikalne komunikacije i broja podzemnih etaža do usvajanja optimalne varijante)
- Aktivnosti projekta (u ovoj verziji aplikacije fiksni spisak aktivnosti sa procenom količina za radove koji najviše definišu kvalitet i cenu objekta),
- Troškovi izgradnje (jedinične cene u funkciji kvaliteta),
- Trajanje aktivnosti i dinamika izgradnje (URC),
- Prihodi od prodaje objekta, profit,
- Dinamika priliva (sa mogućnošću kombinovanja različitih izvora finansiranja),
- Uticaj rizika (na troškove, prihode i trajanje primenom Monte Carlo simulacija)

Nakon kreiranja modula za planiranje sledi izrada promotivnog materijala, a zatim kontakti, prezentacija i pregovori sa potencijalnim partnerima za komercijalizaciju. Vreme će pokazati da li će se aplikacija finalizirati sa modulima za FKG i URC, ili će tržište usloviti novi zaokret u razvoju aplikacije.

3. ZAKLJUČAK

Građevinski projekti ne ispunjavaju ciljeve i opterećeni su problemima u realizaciji. Upravljanje projektom mora da se podigne na viši nivo. To može da se postigne saradnjom nauke i prakse koja može biti dvosmerna. Potrebno je kreirati objedinjujuće aplikacije, baš kao što BIM objedinjuje procese u okviru projektovanja. Razvoj aplikacija je skup i dugotrajan. Najbolji put je korišćenje fondova koji investiraju u inovaciju prakse. Osim finansiranja, fondovi obezbeđuju metodologiju razvoja i multidisciplinarni pristup (istraživanje tržišta, promocija, marketing, komercijalizacija) kako bi se osiguralo usklađivanje naučnih ideja sa potrebama korisnika i tržišta.

U ovom radu opisano je pozitivno iskustvo na razvoju aplikacije za upravljanje projektima uz pomoć dva programa Inovacionog fonda RS. Aplikacija ima razrađen modul za upravljanje promenama na bazi FKG dok je trenutno u toku razvoj modula za planiranje na bazi URC. Prednosti koje aplikacija u konačnol formi nudi su sledeće:

- Optimalno donošenje odluka na samom početku projekta ispitivanjem scenarija u modulu za planiranje.
- Efikasnija kontrola realizacije projekta usmeravanjem investitora i izvođača da se fokusiraju samo na mesečnu realizaciju nekoliko tekućih aktivnosti. Predloženi pristup je u skladu sa Lean konceptom jer povezuje sve što je potrebno za donošenje upravljačkih odluka, eliminišući višak informacija.
- Efikasno upravljanje promenama. Komplikovani sastanci o progresu trebalo bi da se pretvore u brze sastanke za preraspodelu procenata preostale realizacije.
- Smanjenje troškova upravljanja projektom zbog jednostavnijeg pristupa planiranju, kontroli i upravljanju promenama.

Treba istaći da sve navedeno ne garantuje tržišni uspeh naučnih ideja. Po informacijama iz Inovacionog fonda, u periodu 2016-2021 od 28 projekata "Transfer tehnologije", sedam su uspešno završili u komercijalnom smislu. Ni malo ni mnogo. Ali bolja šansa ne postoji.

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