ALFA BK UNIVERSITY
FACULTY OF INFORMATIONTECHNOLOGY
FACULTY O F MATHEMATICS AND COMPUTER SCIENCE
International Scientific Conference

Alfa BK Univerzitet

UDK: 711.45:004.78
DOI: 10.46793/ALFATECHproc25.043I
Original scientific paper

Project Management in Smart City Development: Challenges and Best Practices

Miloš ILIĆ[1], Vladimir MIKIĆ[2]

Abstract: Successful project management represents the basis of effective smart city development, demanding a systematic approach that integrates technology, infrastructure, and urban requirements. However, the proper management of smart city projects encounters different challenges, such as managing budgets, coordinating employees, defining deadlines, and ensuring stakeholder collaboration. Effective project management is essential for overcoming these difficulties and ensuring successful project completion. That is why this study will focus on project management as a means for effective smart city development, and it will also explore challenges and best practices in that context. The goal is to provide a thorough framework for project managers, offering insights into balancing innovation with practical execution in the context of smart city development.

Keywords: Best Practices, Challenges, Development, Project Management, Smart City.

1 INTRODUCTION

With the urban population growing every year and technology rapidly advancing, smart cities have become a strategic solution for communities all over the world to rise to the challenges of urbanization. A smart city optimizes urban infrastructure and operations, uses advanced technology along with unique ideas to enhance urban infrastructure management, manages the operation, offers efficient public services, provides high living standards, and ensures sustainability [1]. However, developing smart cities is a difficult endeavor since it involves a complex set of methods for effectively integrating a diverse range of technological, social, economic, and environmental aspects [2].

Project management plays a pivotal role in the development of smart cities, as these initiatives frequently involve large-scale, multidisciplinary projects that require coordination among a diverse range of stakeholders, including government agencies, private sector partners, technology providers, citizens, [3, 4] etc. Proper management of such projects is necessary to overcome inherent challenges that come with budgetary limitations, regulatory barriers, technological compatibility issues, and continuous innovation demands [5]. Smart city projects are very complex due to their interdisciplinary nature, as they combine urban planning, infrastructure development, data analytics, business intelligence, artificial intelligence, Internet of Things (IoT) systems, environmental considerations, governance, [6, 7] etc. Furthermore, these projects typically span several years and require long-term strategic planning and foresight. Therefore, project managers need to handle different uncertainties, dynamically changing technologies, and evolving citizen expectations and also balance short-term and long-term goals [8]. With the help of advanced project management tools and the utilization of best practices, complex smart city projects can be facilitated and simplified.

This paper seeks to explore and discuss the key challenges in project management in the development of smart cities, identify best practices, and proffer solutions for such challenges. By reviewing the literature, the goal is to uncover key insights that will help future smart city projects be more effectively planned, executed, and evaluated. In the end, the paper aims to give practical and relevant recommendations that could guide project managers, policymakers, and industry leaders in creating smart cities that would be more efficient, sustainable, and citizen-centered.

The paper is structured in a way that, following the introduction, the next section provides an overview of the key concepts related to smart cities and project management. Section 3 gives examples of successful and failed smart city projects, analyzing the key factors that influenced their outcomes. Section 4 presents challenges in project management for smart city development. To address those challenges, Section 5 offers best practices in project management for smart city development. Section 6 discusses key performance indicators for smart city success, focusing on the metrics that determine the effectiveness and sustainability of smart city initiatives. The final section summarizes the key points of the paper and offers conclusions, along with recommendations for future research.

2 UNDERSTANDING SMART CITY AND PROJECT MANAGEMENT CONCEPTS

1.1 Smart cities

Smart cities can be defined as urban areas that rely on the use of modern technologies in addition to data to enhance the quality of life of their residents, optimize the efficiency of metropolis services, reduce resource usage, and ensure sustainability [9]. Smart cities leverage information and communication technologies to optimize the management of resources, including energy, traffic, and solid waste [10, 11]. Different types of sensors and the IoT are used in smart cities to enable real-time data collection. By analyzing this data, important insights can be gained and then used to help improve services and infrastructure. The goal is to enhance urban life by

making cities more efficient, sustainable, and responsive to citizens' needs. A smart city also seeks to make the world a more sustainable, less polluted place with more advanced systems of public transportation. Additionally, these cities aim to improve safety by using technology like surveillance cameras with facial recognition and data analysis. Smart cities in most cases use renewable energy sources, which aids in conserving the environment [12]. With digital platforms, citizens can access information and services that are easily accessible, which makes the city relatively more inclusive. Smart cities provide numerous services to their citizens, but they suffer from many challenges in privacy protection, data protection, and maintaining equal and fair access to technology for all their citizens. Such smart cities, however, thrive on the proper design and execution that takes into consideration these aforementioned humanitarian challenges in fairness and functionality. There is strong potential for smart cities to increase growth in standards of living while also decreasing our environmental impact [13].

Overall, smart cities represent a vision of the future, where innovation and technology collaborate to develop more sustainable and efficient urban environments.

1.2 Project management

Project management represents the process of applying information, knowledge, abilities, tools, methods, and procedures to project tasks in order to achieve project goals and requirements [14]. Using appropriate software for project management greatly simplifies the process. It centralizes project-related data and communications and increases visibility throughout the project. Some of the most well-known project management tools are Asana, ClickUp, Microsoft Project, Miro, Wrike, [15] etc.

There are five phases of the project management process [16]:

1. Project initiation,
2. Project planning,
3. Project execution,
4. Project monitoring and control,
5. Project closure.

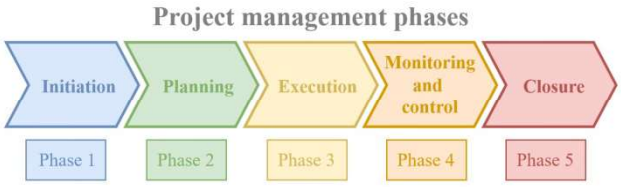

Figure 1 Project management phases

The initiation phase of project management involves transforming ideas into goals and developing a business strategy. This phase entails defining the project (aims, scope, requirements, resources, etc.) and creating a project charter. The planning phase implies developing an outline for completing a project, which involves creating a thorough project schedule. Proper planning can help to avoid many of the leading causes of project failure, such as a lack of vision, inadequate objectives, incorrect schedule projections, poor resource allocation, etc. The execution phase begins with the implementation of the project plan. In this phase, the project manager coordinates numerous tasks and collaborates with the team to generate and finalize outputs. The project monitoring and controlling phase operates concurrently with the project execution phase. During this phase, the project's progress is monitored and reviewed, quality assurance procedures are established, effort and expenses are tracked, etc. Tracking project performance is essential for ensuring its completion remains within the plan, in the budget, and on schedule. The project closing phase represents the final stage of a project management cycle. This phase entails submitting a final deliverable, creating a project closing report, assessing achievements and failures, etc.

Following the key phases in project management is essential for completing a project successfully, as it helps guide the process and ensures that goals are met effectively.

3 EXAMPLES OF SUCCESSFUL AND FAILED SMART CITY PROJECTS

While smart city projects have immense promise, their realization depends on effective project management and strategic planning. Observing real cases can provide insights into challenges and best practices in managing smart city projects. Comparing successful and unsuccessful projects can identify key factors influencing their success. All this information can help make better decisions and provide higher opportunities for long-term sustainability of smart cities.

One successful example is Barcelona, which has implemented various smart city solutions, such as smart traffic lights, IoT-based waste management, smart parking, an extensive public Wi-Fi network [17], etc. This city has managed to achieve all of this thanks to the integration of advanced technologies into public transportation and infrastructure, resource management, sustainable planning, risk management, and active citizen engagement. Project managers played a crucial role in ensuring seamless implementation, effective data management, and regulatory compliance.

Conversely, the smart city project of Sidewalk Labs in Toronto represents a notable failure [18]. The project, aiming to create a high-tech urban center, was faced with gigantic challenges related to privacy concerns, financial sustainability, stakeholder conflicts, and regulatory issues. The deficit of transparency and loss of public trust finally led to the project cancellation in 2020. The necessity for effective governance mechanisms, public involvement, and adherence to privacy legislation can be best understood through this example of a smart city project.

These comparisons demonstrate how integrating technology innovation with transparency, regulation, and community involvement is essential to the success of smart city initiatives. A well-defined strategy and strong governance are essential to guide the project toward its goals. Without clear planning and active community engagement, a project can face significant obstacles that may prevent it from reaching its full potential.

4 CHALLENGES IN PROJECT MANAGEMENT FOR SMART CITY DEVELOPMENT

Smart city development projects are inherently complex since they combine innovative technology, urban planning, and a wide range of stakeholders. Effective project management is essential for overcoming the many challenges that emerge during the preparation, execution, and upkeep stages.

The most important challenges in project management for smart city development are [19, 20]:

- Coordination of various stakeholders,
- Funding and budgetary control,
- Advance technology integration,
- Data privacy and security,
- Risk management.

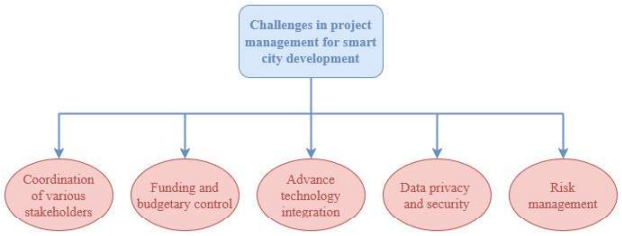

Figure 2 Challenges in project management for smart city development

Projects related to smart cities involve many different stakeholders, ranging from government agencies and private sector businesses to technology corporations and residents. Ensuring effective coordination among all of these stakeholders with varying objectives and priorities can be very difficult and demanding. These projects frequently demand substantial funding, and obtaining reliable financing can be challenging. Furthermore, variable pricing and technology advancements might result in unexpected charges, thereby endangering budgets and deadlines. The smart city relies mainly on different sophisticated technologies, integrating IoT, artificial intelligence, big data, automated processes [21], etc. Ensuring all these technologies work together and flawlessly is a difficult job that requires serious planning and organization. Considering the amount of data generated in smart cities, providing privacy and data security represents important challenges that are not easy to address. Regulations such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in the United States set strict guidelines for data collection, storage, and user consent [22]. Collection and processing of data in the context of smart city initiatives often raise ethical concerns, requiring thorough examination of various issues related to mass surveillance and misuse of personal information, as well as potential biases in AI-driven decision-making. Project managers must therefore not only apply privacy-by-design guidelines and carry out ethical effect analyses but also involve stakeholders in data governance discussions. Public confidence is also provided through transparency in data collection and utilization policies. Because smart city projects pose significant technological and operational hazards, appropriate risk management solutions are required [23]. This involves predicting difficulties such as system breakdowns, bugs, cyberattacks, or unanticipated consequences for municipal people.

To solve these problems, effective project management is crucial as it assures smooth coordination, efficient resource allocation, and the capacity to adapt to emerging technologies and stakeholder demands throughout the development process [24].

5 BEST PRACTICES IN PROJECT MANAGEMENT FOR SMART CITY DEVELOPMENT

To efficiently manage smart city projects, a proactive strategy that prioritizes cooperation, sustainability, and flexibility is necessary. Throughout the development process, best practices in project management assist in minimizing risks, optimizing resources, and guaranteeing that social, technological, and environmental objectives are achieved.

Best practices in project management for smart city development include [25, 26]:

- Involvement and collaboration of stakeholders,
- Adoption of the agile project management approach,
- Implementation of data-driven decision-making,
- Integration of sustainability planning,
- Promotion of transparent communication,
- Application of risk management and contingency planning,
- Leveraging technology for project monitoring and tracking.

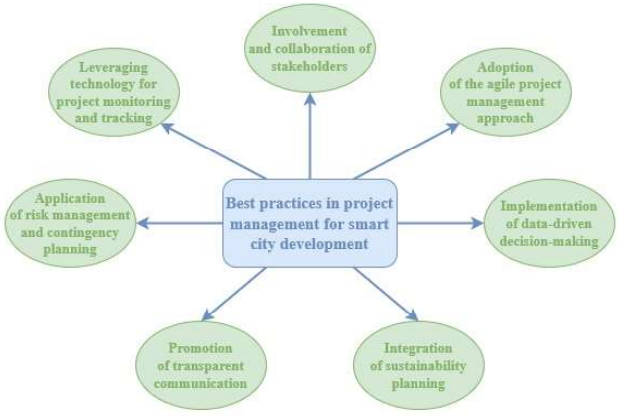

Figure 3 Best practices in project management for smart city development

To guarantee a shared vision and goals that are in line throughout the project, it is crucial that all pertinent stakeholders be included from the outset [27]. Potential conflicts are reduced, and varied viewpoints are taken into account with the support of regular communication and active engagement from residents, IT businesses, community organizations, private sector partners, and government institutions. This collaborative approach fosters a sense of ownership and support, which is critical to the long-term sustainability of the project. Additionally, using an agile project management approach can offer greater flexibility to adapt to the changing demands and difficulties that arise during smart city development [28]. Project managers may guarantee that new problems are promptly resolved and that the project stays on track by segmenting the project into smaller, more manageable phases with regular conduct of reviews and modifications. Given the rapid pace of technological advancement, this iterative method guarantees ongoing adaptation and development [29]. Smart city projects produce massive volumes of data and store them in databases via a database management system [30]; therefore, effectively utilizing this data is critical to making informed decisions. Using analytics, project managers may analyze progress, detect obstacles and delays, and predict risks in real-time. Data-driven techniques can allow for better resource optimization, process improvement, and the efficient and effective achievement of project objectives [31, 32]. Furthermore, long-term sustainability must be a top priority in the design and implementation of smart city projects. This includes not just integrating green technologies and infrastructure but also ensuring that the municipality's systems are adaptable to future problems like

climate change and population increase. Sustainability and resilience are inextricably linked since developing systems that are both ecologically responsible and flexible to future needs will help future-proof the project and lower long-term operational expenses [33]. Also, establishing confidence among stakeholders and the general public requires open, honest, and transparent communication. Keeping everyone updated on the objectives, status, difficulties, and results of the project ensures alignment among all parties and minimizes opposition or misconceptions. Gaining public support and guaranteeing the project's success requires frequent updates, public discussions, and an open decision-making process that fosters an impression of accountability and inclusiveness [34]. It is important to mention that there are hazards associated with any project, particularly those involving large-scale smart city initiatives. Early risk identification and thorough contingency planning can minimize adverse effects on the project's scope, funds, and timeline [35]. Proactive risk management, with the help of sophisticated project management tools, comprises regularly assessing risks, having backup plans, and adjusting techniques to avoid disruptions from unexpected occurrences. Sophisticated technology and project management software are essential in an attempt to coordinate and track the progress of smart city projects [36, 37]. The use of various technologies and their associated features enables project managers to examine schedules, expenditures, and milestones in real time and make informed decisions earlier. Teams may increase productivity, lower human error, and guarantee that the project doesn't experience major setbacks by employing project management software and other technology [38]. Also, the integration of digital twins and AI-based planning enhances project monitoring and decision-making by creating virtual models that simulate real-world urban environments [39]. These technologies allow project managers to predict potential challenges, optimize infrastructure planning, and improve resource allocation, ensuring more efficient and data-driven smart city development.

Project managers can apply these best practices to facilitate the successful, sustainable, and efficient development of smart cities. Through this, they will be in a position to create sustainable city solutions that yield long-term returns. Their efforts remain at the forefront of shaping future cities, designing smart, connected, and adaptive urban environments.

6 KEY PERFORMANCE INDICATORS FOR SMART CITY SUCCESS

For the effective measurement of the impact of smart city projects, project managers must set clear-cut Key Performance Indicators (KPIs) that incorporate economic, social, and environmental outcomes. Long-term sustainability and success of smart city projects are attributed to ongoing monitoring and updating of strategy from collected data.

Some essential KPIs include [40]:

- Energy efficiency,
- Public engagement,
- Cost savings,
- Traffic management,
- Environmental impact.

Energy efficiency refers to the reduction in electricity consumption and the integration of renewable energy sources. Public engagement measures the level of citizen participation in digital platforms and urban decision-making. Cost savings reflect the reduction in operational costs due to smart infrastructure. Traffic management monitors public transport efficiency gains and congestion decreases. Environmental impact deals with the lowering of carbon emissions and improvement of air quality.

By tracking these metrics, project managers can assess whether smart city initiatives are achieving their intended goals and make necessary adjustments to optimize performance [41].

7 CONCLUSION

The development of smart cities is a complex and demanding process that comes with many challenges, such as integrating innovative technologies, guaranteeing data security and privacy, coordinating effectively across different groups of stakeholders, etc. However, these challenges are not insurmountable, as shown in the research conducted in this paper. Project managers can, therefore, navigate such complexity by embracing best practices of continuous stakeholder involvement, engaging and adapting to agile methodology while keeping flexibility in the scheme, and utilizing data analytics to make the right strategic decisions. Sustainability and resilience must be maintained during the project planning and completion stages to ensure long-term success. This makes the role of project management even more crucial for the completion of a smart city to successfully bring benefits both to the environment and to the community over a long period. To ensure sustainable and inclusive growth as cities evolve, the adoption of a strategic and adaptive approach to project management is essential in determining the future of urban development.

Future studies could investigate the use of novel methods combined with modern tools and technologies in project management for smart city development, with an emphasis on their influence on efficiency and sustainability. Additionally, future research could explore the impact of stakeholder collaboration and governance frameworks in overcoming challenges encountered during smart city initiatives.

REFERENCES

[1] Zhuhadar, L., Thrasher, E., Marklin, S., & de Pablos, P. O. (2017). The next wave of innovation—Review of smart cities intelligent operation systems. *Computers in Human Behavior*, *66*, 273-281.

[2] Bibri, S. E., & Krogstie, J. (2017). Smart sustainable cities of the future: An extensive interdisciplinary literature review. *Sustainable cities and society*, *31*, 183-212.

[3] Bjørner, T. (2021). The advantages of and barriers to being smart in a smart city: The perceptions of project managers within a smart city cluster project in Greater Copenhagen. *Cities*, *114*, 103187.

[4] Schipper, R. R., & Silvius, A. G. (2018). Characteristics of smart sustainable city development: Implications for project management. *Smart Cities*, *1*(1), 75-97.

[5] Valentina, M., Tryputen, M., Vitaliy, K., Vitaliy, P., Artemchuk, V., & Andriichuk, V. (2020, May). Implementation of Sustainable Urban Development through Project Management. In *2020 IEEE 7th International Conference on Energy Smart Systems (ESS)* (pp. 221-225). IEEE.

[6] Ilić, M., Mikić, V. (2024). THE USE OF BUSINESS INTELLIGENCE IN THE DEVELOPMENT AND MANAGEMENT OF SMART CITIES. In *Proceedings of International Scientific and Professional Conference "ALFATECH" Smart Cities and modern technologies* (pp. 225-232).

[7] Ilić, M., Mikić, V., Kopanja, L., & Vesin, B. (2023). Intelligent techniques in e-learning: a literature review. *Artificial Intelligence Review*, *56*(12), 14907-14953.

[8] Bundgaard, L., & Borrás, S. (2021). City-wide scale-up of smart city pilot projects: Governance conditions. *Technological Forecasting and Social Change*, *172*, 121014.
[9] Albino, V., Berardi, U., & Dangelico, R. M. (2015). Smart cities: Definitions, dimensions, performance, and initiatives. *Journal of urban technology*, *22*(1), 3-21.
[10] Adenekan, O. A., Ezeigweneme, C., & Chukwurah, E. G. (2024). The evolution of smart cities: Integrating technology, governance, and sustainable development. *International Journal of Applied Research in Social Sciences*, *6*(5), 891-902.
[11] Ilić, M., Gligorić, N., & Mikić, V. (2022). Smernice i tehnička rešenja za recikliranje električnog i elektronskog otpada u svrhu očuvanja životne sredine u Republici Srbiji. *ECOLOGICA*, *29*(105), 57-64.
[12] Rani, S., Mishra, R. K., Usman, M., Kataria, A., Kumar, P., Bhambri, P., & Mishra, A. K. (2021). Amalgamation of advanced technologies for sustainable development of smart city environment: A review. *IEEE Access*, *9*, 150060-150087.
[13] Hui, C. X., Dan, G., Alamri, S., & Toghraie, D. (2023). Greening smart cities: An investigation of the integration of urban natural resources and smart city technologies for promoting environmental sustainability. *Sustainable Cities and Society*, *99*, 104985.
[14] San Cristóbal, J. R., Carral, L., Diaz, E., Fraguela, J. A., & Iglesias, G. (2018). Complexity and project management: A general overview. *Complexity*, *2018*(1), 4891286.
[15] Koivula, A. (2022). Workflow improvements on project management and version control at Xamk Game Studios.
[16] Kostalova, J., Tetrevova, L., & Svedik, J. (2015). Support of project management methods by project management information system. *Procedia-Social and Behavioral Sciences*, *210*, 96-104.
[17] Bakici, T., Almirall, E., & Wareham, J. (2013). A smart city initiative: the case of Barcelona. *Journal of the knowledge economy*, *4*, 135-148.
[18] Filion, P., Moos, M., & Sands, G. (2023). Urban neoliberalism, smart city, and Big Tech: the aborted Sidewalk Labs Toronto experiment. *Journal of Urban Affairs*, *45*(9), 1625-1643.
[19] Khan, H. H., Malik, M. N., Zafar, R., Goni, F. A., Chofreh, A. G., Klemeš, J. J., & Alotaibi, Y. (2020). Challenges for sustainable smart city development: A conceptual framework. *Sustainable Development*, *28*(5), 1507-1518.
[20] Holzmann, V. (2021). Sustainable Smart Cities Challenges in Project Management Curriculum. *Journal of Higher Education Theory and Practice*, *21*(7), 34-43.
[21] Syed, A. S., Sierra-Sosa, D., Kumar, A., & Elmaghraby, A. (2021). IoT in smart cities: A survey of technologies, practices and challenges. *Smart Cities*, *4*(2), 429-475.
[22] Carlson, G., McKinney, J., Slezak, E., & Wilmot, E. S. (2020). General data protection regulation and California consumer privacy act: Background. *Currents: J. Int'l Econ. L.*, *24*, 62.
[23] Ullah, F., Qayyum, S., Thaheem, M. J., Al-Turjman, F., & Sepasgozar, S. M. (2021). Risk management in sustainable smart cities governance: A TOE framework. *Technological Forecasting and Social Change*, *167*, 120743.
[24] Lian, M., & Liu, X. (2022). Significance of building information modeling in modern project management for sustainable smart city applications. *Journal of Interconnection Networks*, *22*(Supp01), 2141007.
[25] Mora, L., Deakin, M., & Reid, A. (2019). Strategic principles for smart city development: A multiple case study analysis of European best practices. *Technological Forecasting and Social Change*, *142*, 70-97.
[26] Barletta, V. S., Caivano, D., Dimauro, G., Nannavecchia, A., & Scalera, M. (2020). Managing a smart city integrated model through smart program management. *Applied Sciences*, *10*(2), 714.
[27] Davis, K. (2014). Different stakeholder groups and their perceptions of project success. *International journal of project management*, *32*(2), 189-201.
[28] Faber, A., Hernandez-Mendez, A., Rehm, S. V., & Matthes, F. (2018, March). An Agile Framework for Modeling Smart City Business Ecosystems. In *Proceedings of the 20th International Conference on Enterprise Information Systems (ICEIS 2018)* (pp. 39-50).
[29] Ayed, H., Vanderose, B., & Habra, N. (2014, June). Supported approach for agile methods adaptation: An adoption study. In *Proceedings of the 1st International Workshop on Rapid Continuous Software Engineering* (pp. 36-41).
[30] Ilić, M., Kopanja, L., Zlatković, D., Trajković, M., & Ćurguz, D. (2021, June). Microsoft sql server and oracle: Comparative performance analysis. In *The 7th International conference Knowledge management and informatics* (pp. 33-40).
[31] Khan, U. A., Bajwa, W. U., Nedic, A., Rabbat, M. G., & Sayed, A. H. (2020). Optimization for data-driven learning and control. *Proceedings of the IEEE*, *108*(11).
[32] Czvetkó, T., Kummer, A., Ruppert, T., & Abonyi, J. (2022). Data-driven business process management-based development of Industry 4.0 solutions. *CIRP journal of manufacturing science and technology*, *36*, 117-132.
[33] Kutty, A. A., Kucukvar, M., Onat, N. C., Ayvaz, B., & Abdella, G. M. (2023). Measuring sustainability, resilience and livability performance of European smart cities: A novel fuzzy expert-based multi-criteria decision support model. *Cities*, *137*, 104293.
[34] Yigitcanlar, T., Kankanamge, N., & Vella, K. (2022). How are smart city concepts and technologies perceived and utilized? A systematic geo-Twitter analysis of smart cities in Australia. In *Sustainable smart city transitions* (pp. 133-152). Routledge.
[35] Al Sharif, R., & Pokharel, S. (2022). Smart city dimensions and associated risks: Review of literature. *Sustainable cities and society*, *77*, 103542.
[36] Stratigea, A., Papadopoulou, C. A., & Panagiotopoulou, M. (2015). Tools and technologies for planning the development of smart cities. *Journal of Urban Technology*, *22*(2), 43-62.
[37] Drozhzhinov, V., Kupriyanovsky, V., Namiot, D., Sinyagov, S., & Kharitonov, A. (2017). Smart Cities: models, tools, rankings, and standards. *International journal of open information technologies*, *5*(3), 19-48.
[38] Burga, R., Spraakman, C., Balestreri, C., & Rezania, D. (2022). Examining the transition to agile practices with information technology projects: Agile teams and their experience of accountability. *International Journal of Project Management*, *40*(1), 76-87.
[39] Bibri, S. E., Huang, J., Jagatheesaperumal, S. K., & Krogstie, J. (2024). The synergistic interplay of artificial intelligence and digital twin in environmentally planning sustainable smart cities: A comprehensive systematic review. *Environmental science and ecotechnology*, 100433.
[40] Angelakoglou, K., Kourtzanidis, K., Giourka, P., Apostolopoulos, V., Nikolopoulos, N., & Kantorovitch, J. (2020). From a comprehensive pool to a project-specific list of key performance indicators for monitoring the positive energy transition of smart cities—An experience-based approach. *Smart Cities*, *3*(3), 705-735.
[41] Bosch, P., Jongeneel, S., Rovers, V., Neumann, H. M., Airaksinen, M., & Huovila, A. (2017). CITYkeys indicators for smart city projects and smart cities. *CITYkeys report*, *10*, 2027.

Contact information:

Miloš ILIĆ 1, teaching assistant
(Corresponding author)
1991
Faculty of Information Technologies, Alfa BK University, Palmira Toljatija 3, 11000 Belgrade, Serbia
milos.ilic@alfa.edu.rs
https://orcid.org/0000-0003-1190-1181

Vladimir MIKIĆ 2, teaching assistant
1996
Faculty of Information Technologies, Alfa BK University, Palmira Toljatija 3, 11000 Belgrade, Serbia
vladimir.mikic@alfa.edu.rs
https://orcid.org/0000-0003-3971-8725