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Systematic Literature Review: Project Management in the VUCA Era and Digital Transformation of Information Systems

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Abstract: The rapid development of information and communication technology has created new opportunities and challenges for project management, especially in the VUCA environment characterized by volatility, uncertainty, complexity, and ambiguity. This study aims to explore the adaptation of project management in the VUCA era and the impact of digital transformation on information systems. The method used is the Systematic Literature Review (SLR), by reviewing literature from various relevant sources between 2024 and some are targeted to be published in 2025. The results of the study indicate that Agile and Scrum methodologies are the main choices in managing projects in a dynamic environment, while digital transformation, with technologies such as cloud computing and data analytics, increases project efficiency and effectiveness. In addition, the success factors for project implementation in the VUCA era are greatly influenced by innovation, adaptability, proactive risk management, and effective team collaboration. This study concludes that a flexible and innovative project management approach, supported by digital transformation, is essential to facing challenges in the VUCA era, especially in the context of information systems in Indonesia.

Keywords: Project Management, VUCA Era, Digital Transformation, Agile, Scrum, Information Systems, Innovation, Risk Management, Collaboration.

INTRODUCTION

In recent years, the development of information and communication technology has significantly changed the way organizations manage projects. On the other hand, the business world and industry are facing new challenges known as the VUCA era, which is an acronym for Volatility, Uncertainty, Complexity, and Ambiguity. This environment requires companies to adapt quickly to unexpected changes, both internally and externally.

The VUCA (Volatility, Uncertainty, Complexity, Ambiguity) era has brought significant new challenges to various sectors, including project management. Market volatility, economic uncertainty, and increasing complexity and ambiguity in decision-making create an uncertain environment for many organizations. In this condition, traditional project management methodologies such as waterfall, which rely on linear planning and predictability, become less relevant (Castro & Sainati, 2024). These methodologies are often unable to accommodate changes that occur mid-project journey, resulting in projects failing to meet deadlines, budgets, and

objectives. This situation forces organizations to explore a more flexible and adaptive approach to managing projects, with a focus on the ability to respond to unexpected changes quickly and efficiently.

On the other hand, digital transformation has brought about a revolutionary change in the way organizations manage their projects. Technologies such as cloud computing, big data analytics, and artificial intelligence (AI) provide organizations with the opportunity to optimize project management through better data management, faster decision-making, and more effective collaboration across project teams (Cao et al., 2024). Cloud computing enables real-time data storage and access, which helps project managers monitor project progress more efficiently and take corrective actions promptly. Data analytics supports data-driven decision-making, which reduces the risk of making wrong decisions in a complex environment. Meanwhile, AI helps in the automation of routine tasks, which can save time and project costs.

Despite the enormous potential of digital transformation, many organizations still face challenges in implementing these technologies. Limited technological infrastructure in many companies, especially in sectors that are not yet fully digital, is often a major barrier to harnessing the benefits of new technologies. In addition, the lack of human resource competencies that understand digital technologies and how to integrate them into project management is a challenge in itself (Alsulami & Hamza, 2024). Digital transformation also requires significant changes in organizational culture, where many organizations still rely on traditional mindsets and are reluctant to innovate or adapt to new ways of working.

In this VUCA era, Agile and Scrum methodologies have become the primary choice for many organizations due to their flexibility and adaptability. Unlike traditional methodologies, Agile allows for an iterative approach, where projects are divided into short cycles that are easier to manage and adapt to changes. Scrum, as one of the Agile implementations, relies on intense team collaboration and continuous value delivery through scheduled sprints (C. Z. Li et al., 2024). Both approaches have proven to be more responsive in dealing with change, allowing project teams to quickly adapt to new conditions, both in terms of market needs and technology.

However, implementing Agile and Scrum in the field is not always easy. The main challenge lies in the resistance to change within the organization itself. A rigid organizational culture that does not support innovation often hinders the effective implementation of this methodology. Many companies still maintain a strict hierarchical structure, which is contrary to the Agile principles that encourage cross-functional collaboration and rapid decision-making. In addition, non-proactive risk management often leads to a failure to anticipate or address emerging issues, which ultimately harms the project.

Another very important factor in the success of Agile implementation and digital transformation is team collaboration. Projects in the VUCA era often involve multiple stakeholders, both internal and external, with varying interests. Therefore, the success of the project depends heavily on the team's ability to collaborate effectively and align their priorities. Good communication, strong coordination, and close cooperation between project team members and stakeholders are essential to ensure smooth project implementation (Cocchiara et al., 2024).

Thus, to overcome the challenges in the VUCA era and take advantage of the opportunities offered by digital transformation, organizations need to not only adopt more flexible project management technologies and methodologies, but also invest in changing the organizational culture and improving the competency of its human resources. The combination of these factors will help organizations become more resilient and adaptive in facing a dynamic and uncertain business environment.

Therefore, more in-depth research is needed to understand how project management can adapt effectively in facing the challenges of the VUCA era and how digital transformation can be optimally applied in the context of information system-based project management. This study aims to explore the adaptation of project management in the VUCA era and the impact of digital transformation on information systems, with the hope of providing useful recommendations for

practitioners and researchers in the field of project management.

This study uses a Systematic Literature Review (SLR) approach to explore various studies and articles related to project management in the VUCA era and digital transformation in information systems. This literature review process focuses on the latest studies relevant to the challenges of project management and digital transformation, using sources from journals, conference proceedings, and relevant textbooks.

The Influence of VUCA in Project Management

The VUCA (Volatility, Uncertainty, Complexity, Ambiguity) environment introduces a number of significant new challenges to project management. In a volatile context, rapid market changes often force project teams to make last-minute adjustments, affecting schedules and resource allocation. Uncertainty brings unpredictable risks that are difficult to predict, while complexity creates difficulties in coordinating the various interrelated project elements. Ambiguity exacerbates the situation with unclear or ambiguous information that makes decision making difficult.

A study by Lawong & Akanfe (2024) highlights that traditional approaches such as waterfall that focus on long-term planning and linearity are unable to address the challenges of the VUCA environment. In the waterfall model, each phase of the project must be completed before moving on to the next phase, resulting in a lack of flexibility when sudden changes occur in the middle of the project cycle. Therefore, organizations are increasingly turning to Agile and Scrum methodologies, which are more dynamic and adaptive. These approaches allow for rapid iteration, continuous iteration, and the ability to adjust priorities quickly, making them better suited to dealing with volatility and uncertainty in projects.

Digital Transformation and Project Management

Digital transformation has had a significant impact on project management, especially those based on information systems. Technologies such as cloud computing, data analytics, and real-time project management tools enable more efficient project management. Sońta-Drączkowska et al. (2024) point out that digitalization enables project teams to access information and resources faster, which helps in better decision-making and more proactive risk management.

Cloud computing technology allows project managers to access project data and status anytime and anywhere, making collaboration between geographically distributed teams easier and more transparent. In addition, data analytics helps teams predict project trends and identify potential issues early, which provides benefits in risk mitigation and resource optimization. With this digital transformation, organizations are forced to continue to innovate and adapt, especially in an increasingly complex and uncertain environment. The speed of adoption and integration of digital technologies also determines a company's ability to compete and maintain their competitiveness in the market.

Agile and Scrum Methodologies

Agile and Scrum methodologies have become standards in project management in VUCA environments. Agile, which focuses on an iterative and incremental approach, provides the flexibility needed to deal with continuous change. Scrum, as one implementation of Agile, emphasizes more intensive teamwork, with the role of the Scrum Master serving as a facilitator to keep the process running smoothly.

A study by Bahnas et al. (2024) showed that Agile and Scrum can improve project completion timeliness by up to 20%. In Scrum, teams work in short cycles called “sprints,” which allow for continuous value delivery. This ensures that each iteration adds significant value, allowing the project team to quickly respond to new needs or changes. This approach also encourages greater stakeholder engagement, which helps ensure that the product or service being developed meets their expectations and needs in a timely manner.

In addition, this approach emphasizes the importance of continuous evaluation through "retrospectives" after each sprint, which allows the team to refine work processes and continuously improve project performance. In a dynamic and uncertain environment, flexibility and speed of response are critical, and Agile and Scrum methodologies provide the structure and approach to support this.

Success Factors in Project Implementation in the VUCA Era

The success of a project in the VUCA era depends not only on the project management methodology used, but also on a number of other key factors. Wasilkiewicz Edwin et al. (2024) emphasize that innovation, adaptability, proactive risk management, and effective team collaboration are important factors that determine project success.

Innovation is an important aspect in dealing with the dynamics of a constantly changing environment. Organizations that are able to innovate quickly tend to be better prepared to respond to market volatility and changing needs. In addition, the project team's ability to adapt to unexpected situations also plays a key role. Proactive risk management involves identifying, assessing, and mitigating risks early in the project, allowing organizations to reduce the negative impact of unexpected changes.

Effective team collaboration is also critical, especially in projects involving multiple stakeholders. Open and transparent communication allows teams to share information quickly and respond to changes more efficiently. The use of digital tools that support cross-team collaboration and real-time resource management also helps create a more dynamic and responsive work environment, accelerating project completion and ensuring better quality results.Thus, the success of project implementation in the VUCA era depends on the balance between innovation, technology, and the organization's ability to remain flexible and adapt to unexpected changes.

METHOD

This study uses the Systematic Literature Review (SLR) method as the main approach to collect, analyze, and synthesize various relevant literature sources related to project management in the context of VUCA (Volatility, Uncertainty, Complexity, Ambiguity) and digital transformation of information systems. SLR was chosen because this approach allows researchers to comprehensively evaluate existing literature, as well as identify research gaps that can be used as a basis for further studies. In this process, we followed several systematic stages aimed at ensuring that only relevant and high-quality literature was included in this review (K. Wang et al., 2024).

The first stage is data collection. Relevant literature was identified from various academic databases such as ScienceDirect. The search was conducted using the keywords “Systematic Literature Review: Project Management in the VUCA Era and Digital Transformation of Information Systems”. Inclusion criteria included articles published between 2024 and targeted to be published in 2025, with a focus on studies exploring project management in the context of the VUCA era and digital transformation. In addition, only articles published in journals with good academic reputations or international conference proceedings were selected to maintain the quality of the research.

After the data collection stage, the literature selection process was carried out. Articles found through the initial search were screened based on their relevance to the research topic and their quality. Irrelevant articles, such as studies that did not discuss project management or were not related to VUCA or digital transformation, were excluded from the analysis. To ensure objectivity, each article was assessed based on the abstract, methods, and research results presented by the original authors.

Next, analysis and synthesis of the selected literature were conducted. Relevant articles were analyzed in depth to identify trends, challenges, and solutions proposed by various studies related to project management in the VUCA era and digital transformation. The results of this analysis

were used to develop research findings, including identifying the most effective methodologies for managing projects under conditions of uncertainty and how digital technology can support the process.

This SLR method allows us to develop a comprehensive view of how organizations can face the challenges that arise in the VUCA era and how digital transformation can affect the project management approach. This approach also provides a systematic and transparent framework in identifying relevant literature, so that the research results can be relied upon and used as a reference for further research in this field.

RESULT AND DISCUSSION

Results

Table above contains information from various scientific articles related to project management published in 2024 and 2025. This table contains four main columns:

Tabel 1. Literature Review Used In Research

No	Author Name	Year	Title	Conclusion
1	Alsulami, B. T., & Hamza, M. A.	2024	Identifying project management competencies in the Saudi public sector	This study identifies essential project management competencies within the Saudi public sector, aiming to enhance project outcomes through targeted skills development.
2	Bahnas, N., Adel, K., Khallaf, R., & Elhakeem, A.	2024	Monitoring and controlling engineering projects with blockchain-based critical chain project management	The research shows how blockchain integrated with critical chain project management can enhance monitoring and control in engineering projects, improving transparency and efficiency.
3	Barma, R., Reza, F., Kabir, Z., Shammi, M., & Tareq, S. M.	2024	Implementation of environmental management plans in the transport sector development projects: A case study of two mega projects in Bangladesh	The study examines the effectiveness of environmental management plans in large transport projects, highlighting key factors for successful implementation in Bangladesh's development sector.
4	Cao, X., Xia, X., & Wang, M.	2024	Blockchain-based change management in engineering, procurement and construction projects	Blockchain technology is proposed to streamline change management in EPC projects, improving record-keeping and reducing conflicts during project execution.
5	Castro, A., & Sainati, T.	2024	Bridging the gap: Reintegrating legal perspectives into project management	The research argues for a more integrated legal perspective in project management to address contractual issues more effectively, thereby reducing project risks.
6	Cocchiara, C. M., Lo Nigro, G., Roma, P., & Ragusa, A.	2024	Project and knowledge management at European public space agencies: The need for a three-dimensional project management office	The authors highlight the need for a more advanced PMO model in European space agencies to handle both project and knowledge management effectively, ensuring long-term organizational success.
7	Cristina, M., Nogueira, P., Oliveira, M. M., & Santos, C.	2024	Project management in healthcare: An examination of organizational competence	This study reveals that organizational competence in project management is a critical factor for the success of healthcare projects, suggesting targeted skill development for improvement.
8	Ekanayake, B., Wong, J. K. W., Fini, A. A. F., Smith, P., & Thengane, V.	2024	Deep learning-based computer vision in project management: Automating indoor construction progress monitoring	Deep learning and computer vision technologies can significantly automate progress tracking in indoor construction, offering more efficient project management solutions.
9	Emblemsvåg, J.	2024	Lean project planning – Bridging last planner system and earned value management	Combining Lean project planning techniques with earned value management enhances project efficiency and improves performance tracking.

No	Author Name	Year	Title	Conclusion
10	Gong, X., Tao, X., Zhang, M., Xu, Y., Kwok, H. H. L., Dai, J., & Cheng, J. C. P.	2024	Secure environmental, social, and governance (ESG) data management for construction projects using blockchain	Blockchain technology ensures secure management of ESG data in construction projects, providing transparency and trust among stakeholders.
11	Jayasuriya, S., Zhang, G., & Yang, R. J.	2024	Towards successful economic infrastructure partnership project delivery through effective stakeholder management	Effective stakeholder management is key to the successful delivery of public-private partnership (PPP) infrastructure projects, particularly in terms of aligning interests and reducing conflicts.
12	Lawong, D. A., & Akanfe, O.	2024	Overcoming team challenges in project management: The scrum framework	The Scrum framework is effective in addressing team challenges in project management, promoting adaptability and continuous improvement within project teams.
13	Li, C. Z., Tam, V. W. Y., Hu, M., & Zhou, Y.	2024	Lean construction management: A catalyst for evaluating and enhancing prefabricated building project performance in China	Lean construction techniques provide a structured approach to evaluate and improve the performance of prefabricated building projects, especially in the Chinese market.
14	Li, Y., Xiang, P., Chan, P. W., & Zhang, J.	2024	Examining owners' and contractors' motivations to participate in collaborative risk management of mega infrastructure projects	Both owners and contractors are motivated to engage in collaborative risk management for mega infrastructure projects, but their incentives vary, requiring alignment for project success.
15	Prosser, E.	2024	Navigating projects in academic libraries: A scoping review of project management applications	The study provides a comprehensive review of how project management principles are applied in academic libraries, identifying gaps and areas for future development.
16	Sajjad, M., Hu, A., RADU, D., Waqar, A., Almujibah, H. R., & Mateen, A.	2024	BIM implementation in project management practices for sustainable development: Partial Least square approach	The research demonstrates the effectiveness of BIM in project management for sustainable development, focusing on a Partial Least Square (PLS) methodology.
17	Sońta-Drączkowska, E., Cichosz, M., Klimas, P., & Pilewicz, T.	2024	Co-creating innovations with users: A systematic literature review and future research agenda for project management	Co-creating innovations with users in project management offers significant benefits, but requires a clear research agenda to address existing gaps in knowledge.
18	Thiele, B., Abbasi, A., & Ryan, M. J.	2024	Improving Project Forecasting Accuracy by Developing the Normalised Project Management Baseline	Developing a normalized project management baseline can enhance forecasting accuracy in projects, helping better predict timelines and costs.
19	Varajão, J., Lopes, L., & Tenera, A.	2025	Framework of standards, guides and methodologies for project, program, portfolio, and PMO management	The paper proposes a comprehensive framework for integrating standards, guides, and methodologies in the management of projects, programs, portfolios, and PMOs.
20	Wang, H., Wang, W., & Jin, Z.	2024	Mechanism for allocating delay to constituent activities in project management	The study offers a mechanism to distribute delays among project activities fairly, helping managers mitigate time overruns and improve efficiency.
21	Wang, K., Dong, P., Chen, W., Ma, R., & Cui, L.	2024	Research on Risk Management of Ship Maintenance Projects Based on Multi Agent Swarm Model Simulation Method	Multi-agent swarm model simulations are proposed as a tool to improve risk management in ship maintenance projects, offering dynamic and adaptive solutions.

No	Author Name	Year	Title	Conclusion
22	Wasilkiewicz Edwin, K., Kongsvik, T., & Albrechtsen, E.	2024	An analysis of the relationship between project management and safety management in the Norwegian construction industry	The paper highlights the close link between project and safety management in construction, emphasizing the need for integrated approaches to improve safety outcomes.
23	Zaki, M., Aziz, E. T. T., Oussama, J., Elallam, O., El Ghoubali, D., Jhilal, F., et al.	2024	A proposed framework for defining the relationship between complexity, project categorization, and project risk management	A framework is proposed to better understand and manage the relationship between project complexity, categorization, and risk management in the medical sector.
24	Zhang, Y. F.	2024	Too little or too much transparency? Influencing accountability in project management through the practices of using digital technologies	The paper discusses how digital technology influences transparency and accountability in project management, arguing for a balanced approach to avoid overloading or under-informing stakeholders.

Source: processed data, 2024.

This table is useful for understanding the latest trends in project management research, especially in terms of technology implementation, risk management, and innovations in project management methodologies across industries. This study explores project management in the VUCA era and the impact of digital transformation, using the Systematic Literature Review (SLR) methodology to review related literature from 2024. Based on this literature analysis, it was found that Agile and Scrum methodologies are increasingly being adopted by organizations due to their adaptability in dealing with volatility and uncertainty that often occurs in the VUCA era. In addition, digital transformation through technologies such as cloud computing and data analytics also improves the efficiency of project management and accelerates data-driven decision making in complex environments (Prosser, 2024).

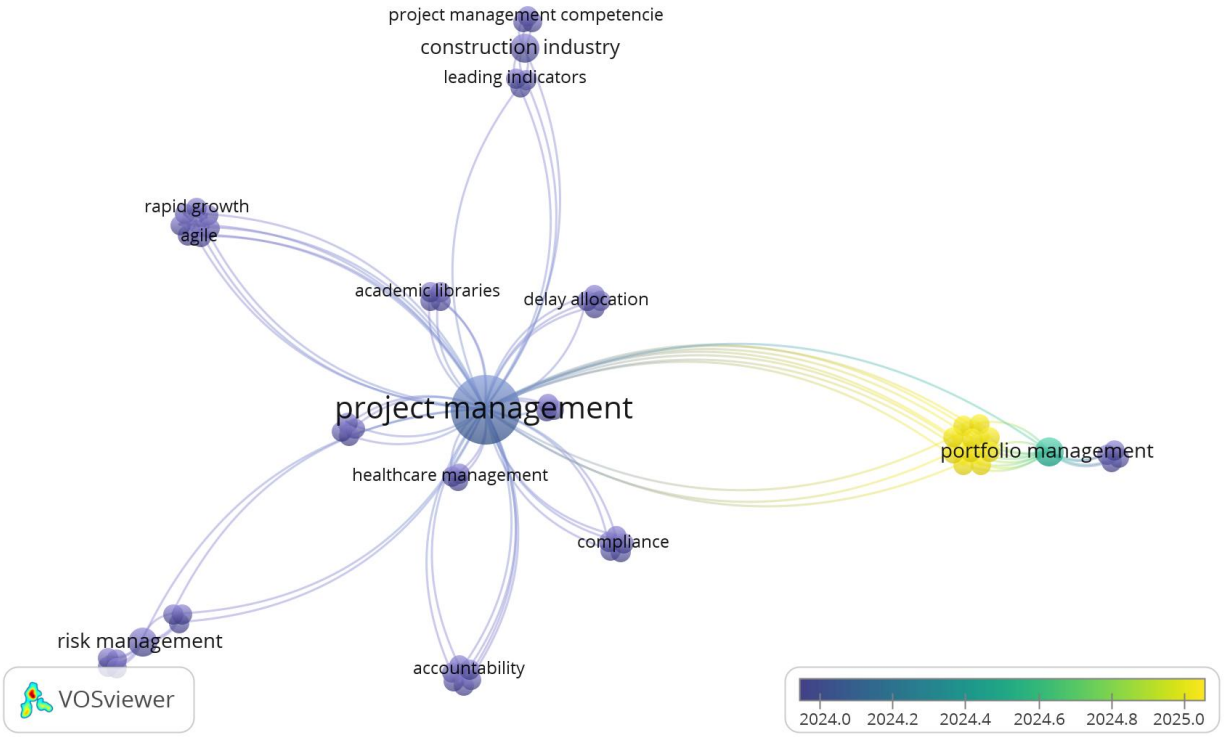

Figure 1. Time map visualization of terms related to "project management" using VOSviewer.

This image is a time map visualization of terms related to "project management" using VOSviewer. Here is the analysis based on visible elements:

1. Network Center: The term “project management” remains at the center, indicating that all other terms are directly or indirectly related to project management.
2. Color and Time Scale: This figure uses a color scale from blue to yellow to indicate the time period, as seen in the legend at the bottom of the figure. Blue represents terms that appeared more frequently in early 2024, while yellow represents terms that appeared more frequently or recently appeared in 2025.
   a) Cluster Portfolio Management (Yellow-Green)
   The term “portfolio management” and related terms, such as those in bright yellow and light green, indicate that this subtopic is likely to be a newer research focus or topic, with higher intensity approaching 2025.
   b) Other Clusters (Blue-Purple)
   Terms such as “risk management,” “agile,” “construction industry,” and “compliance” were discussed more frequently in early to mid-2024, corresponding to the blue to purple colors in the figure. This indicates that these aspects had become an important part of the project management literature before 2025.
3. Connections Between Terms: The lines connecting the terms show the relationships or connections between the various subtopics in project management. The term “portfolio management” has many connections growing towards the end of 2024 and 2025, indicating that portfolio management is likely to be a major concern in project management in the future.

The figure above shows the temporal development in the literature related to project management, where topics such as “portfolio management” become more dominant in late 2024 and 2025, while other topics such as “risk management” and “agile” remain important but are discussed more earlier in 2024.

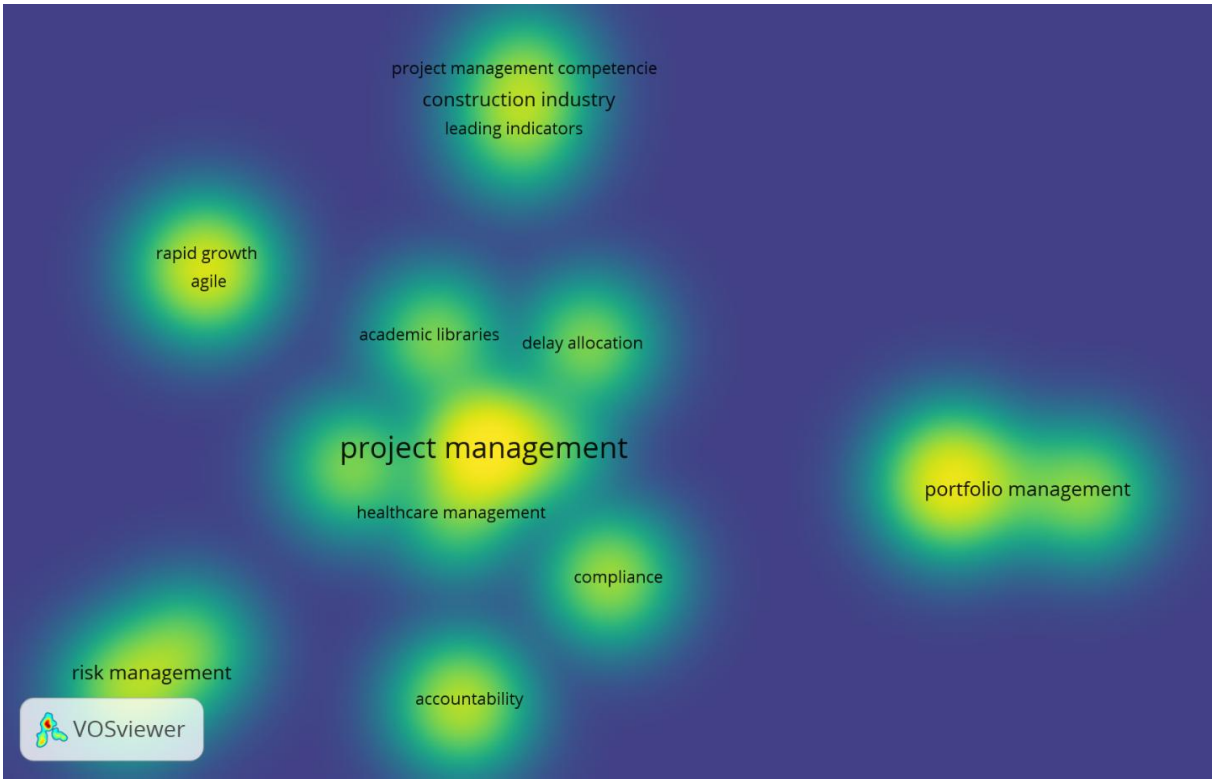

Figure 2. Heatmap visualization

The image above is a heatmap visualization of terms related to "project management" using VOSviewer. Here is a description of the important elements of this image:

1. Network Center: “Project management” is located in the center of the heat map, indicating

that this term is the main focus of the analyzed term network. The area around this term is colored bright yellow, indicating that this is the term that is most frequently discussed or connected to other terms.

2. Clusters with Different Densities:
   a. Bright Yellow Cluster (High Density Level): The term "project management" has a very high density, meaning that it is frequently discussed in the analyzed literature. The same goes for the term "portfolio management" on the right, indicating that portfolio management is also a frequently discussed topic in the context of project management.
   b. Yellow-Green Cluster (Medium Density Level): Terms such as "construction industry", "project management competence", "rapid growth", and "agile" show that these topics are also important, but have a lower density than "project management".
   c. Green Cluster (Low Density Level): Terms such as "academic libraries", "delay allocation", "healthcare management", and "compliance" have lower densities, indicating that these terms are discussed less frequently than other terms in the map.
   d. Blue Area (Low Density): The dark blue areas around some clusters indicate that terms in those areas appear less frequently or have lower relevance in discussions related to project management.

This heat map highlights the density of key terms related to project management, such as "portfolio management" and "project management," as well as topics related to the construction industry, risk management, and the rapid growth in project management adoption.

Discussion

This study produces several important findings related to project management in the VUCA era and digital transformation of information systems. Based on the analysis of the collected literature, there are four main findings related to the challenges and solutions in project management in uncertain and complex environments, as well as the impact of digitalization on the effectiveness of project management (Wang et al., 2024).

The Influence of VUCA in Project Management

The VUCA (Volatility, Uncertainty, Complexity, Ambiguity) environment creates major challenges for project managers. Findings from the analyzed literature indicate that organizations face challenges in terms of rapid change, market uncertainty, and increasing complexity in project management (Varajão et al., 2025). A study by Jayasuriya et al. (2024) highlights that global market volatility and economic uncertainty are forcing organizations to become more adaptive, with a focus on the ability to shift strategies quickly. This condition makes it clear that traditional, rigid project management approaches, such as the waterfall method, are no longer adequate to manage projects in the VUCA era (Emblemsvåg, 2024).

The Importance of Agile and Scrum Methodologies

In the face of VUCA environmental dynamics, Agile and Scrum methodologies emerge as the most frequently adopted solutions by organizations. Li et al. (2024) in their study emphasized that Agile enables rapid iteration, increased team collaboration, and flexibility in responding to sudden project changes. This methodology also provides higher adaptability to changing customer needs, which is very important in an environment filled with uncertainty. The study found that Agile and Scrum not only help reduce uncertainty but also increase the efficiency and timeliness of project completion by up to 20% (Sajjad et al., 2024).

Digital Transformation in Project Management

Digital transformation has a significant impact on project management, especially in terms of information systems. Findings from Ekanayake et al. (2024) show that the use of technologies

such as cloud computing, data analytics, and project management software enables organizations to manage projects in real-time, reduce risks, and facilitate better collaboration between geographically dispersed teams. Digital transformation also supports faster, data-driven decision-making, which is critical in managing projects amidst uncertainty (Zaki et al., 2024).
Information systems enhanced with digital technologies, such as cloud platforms and data analytics, enable more efficient resource management, real-time monitoring of project progress, and early detection of potential risks. This is especially important for complex projects that require effective risk management amidst increasing volatility and uncertainty (Cristina et al., 2024).

Success Factors for Project Implementation in the VUCA Era

The success of a project in the VUCA era is not only determined by the methodology used, but also by other factors such as adaptability, innovation, risk management, and effective team collaboration. Zhang (2024) highlight that innovation plays a vital role in dealing with uncertainty and volatility (Thiele et al., 2024). Organizations that continue to innovate tend to be better prepared to respond to sudden changes. In addition, proactive risk management, which includes continuous risk identification and mitigation, is a key factor in the success of project implementation (Gong et al., 2024).

The study also shows that effective team collaboration is essential in dealing with complex and ambiguous environments. Good communication, both internally within the team and with external stakeholders, allows organizations to respond quickly to changes and issues that arise during the project.

The results of this study make it clear that organizations operating in the VUCA era must adapt to a more flexible and responsive approach. Agile and Scrum are the methodologies of choice because of their flexibility in responding to rapid change. However, it is also important for organizations to pay attention to other factors such as innovation, risk management, and effective team collaboration to ensure project success (Barma et al., 2024)

In addition, digital transformation plays a significant role in supporting more efficient project management. Information systems supported by digital technologies such as cloud computing and data analytics help organizations better monitor and manage projects, reduce risks, and facilitate faster decision-making. However, this digital transformation also requires increased human resource competency and changes in organizational culture to support effective technology implementation .

By understanding the challenges and opportunities offered by the VUCA era and digital transformation, organizations can optimize their project management, ensuring that they remain competitive and resilient in the face of changing environmental dynamics.

CONCLUSION

This study confirms that project management in the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) era requires a more flexible and adaptive approach. Traditional methodologies such as Waterfall are no longer effective in managing projects in a dynamic and uncertain environment. Instead, Agile and Scrum have emerged as the main solutions due to their ability to respond quickly to changes and improve team collaboration. In addition, digital transformation, especially with the use of technologies such as cloud computing and data analytics, significantly improves efficiency in project management and data-driven decision making. The success of project implementation in the VUCA era is also greatly influenced by the organization's ability to innovate, proactively manage risks, and ensure effective team collaboration. Organizations that are supported by an innovative approach and good adaptability tend to be better prepared to face the dynamics and uncertainties that arise.

Suggestion

In facing the challenges in the VUCA era and being able to take advantage of opportunities

from digital transformation in project management, namely: 1) Organizations must be more open in adopting Agile and Scrum methodologies to increase flexibility in project management, especially in an environment full of uncertainty. Team training in these methodologies must also be improved. 2) The implementation of digital technologies, such as cloud computing and data analytics, must be optimized in project management to increase efficiency, reduce risk, and enable real-time project management. 3) To support effective digital transformation, it is important for organizations to improve HR competencies in technology and digital-based project management. 4) Organizations need to develop more proactive risk management by strengthening risk identification and mitigation mechanisms early in the project cycle, especially in projects in uncertain environments. 5) Given the importance of teamwork in dealing with complexity and ambiguity, organizations need to improve communication and collaboration between teams, both internally and with external stakeholders, to ensure project success.

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