JITK (JURNAL ILMU PENGETAHUAN DAN TEKNOLOGI KOMPUTER)

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

SYSTEMATIC LITERATURE REVIEW: CHALLENGES AND SOLUTIONS ON AGILE PROJECT MANAGEMENT IN PUBLIC SECTOR

Handini Mekkawati[1*]; Teguh Raharjo[2]; Rina Yuniarti[3]

Faculty of Computer Science[1,2,3]
University of Indonesia, Indonesia[1,2,3]
https://www.ui.ac.id[1,2,3]
handini.mekkawati21@ui.ac.id[1*], teguhr2000@gmail.com[2], rina.yuniarti@ui.ac.id[3]

(*) Corresponding Author
(Responsible for the Quality of Paper Content)

Abstract— *The public sector is transforming by adopting an agile approach to overcome bureaucratic rigidity and lagging the private sector. The aim is to overcome the limitations of traditional approaches by encouraging flexibility in planning, operations, and service delivery. In the face of diverse, agile characteristics, further research is required on the challenges and best practices other public sector organizations can adopt. This research identifies key challenges in agile implementation within the PMBOK 7th edition project performance domains with the most issues: Development Approach and Life Cycle and Project Work Domain. Using a systematic literature review (SLR), 35 of 680 reviewed papers were selected as references. The biggest challenges were in the Project Work Domain, dominated by the context of monitoring new work and changes, project processes, and procurement processes. Best practices were identified to address these challenges and guide other public sectors in supporting more flexible and responsive public service delivery.*

Keywords*: agile, agile project management, challenges, public sector, SLR*

Intisari—*Sektor publik bertransformasi dengan mengadopsi pendekatan yang lincah untuk mengatasi kekakuan birokrasi dan ketertinggalannya dengan sektor swasta. Tujuannya adalah untuk mengatasi keterbatasan pendekatan tradisional dengan mendorong fleksibilitas dalam perencanaan, operasi, dan pemberian layanan. Dalam menghadapi karakteristik agile yang beragam, penelitian lebih lanjut diperlukan mengenai tantangan dan praktik terbaik yang dapat diadopsi oleh organisasi sektor publik lainnya. Penelitian ini mengidentifikasi tantangan utama dalam implementasi agile dalam dua domain kinerja proyek yang memiliki masalah terbanyak di PMBOK edisi ke-7: Pendekatan Pengembangan dan Siklus Hidup, dan Domain Pekerjaan Proyek. Dengan menggunakan tinjauan literatur sistematis (SLR), 35 dari 680 makalah yang ditinjau dipilih sebagai referensi. Tantangan terbanyak ada pada Project Work Domain yang didominasi oleh konteks pemantauan pekerjaan baru dan perubahan, proses proyek, dan proses pengadaan. Praktik-praktik terbaik diidentifikasi untuk mengatasi setiap tantangan tersebut untuk memberikan panduan bagi sektor publik lainnya dalam mendukung pemberian layanan publik yang lebih fleksibel dan responsif.*

Kata Kunci*: agile, agile project management, tantangan, sektor publik, SLR*

INTRODUCTION

In today's era, modernization efforts in the digital transformation of the public sector are hampered by rigid organizational structures and governance, thus hindering the flexibility and adaptability of project management [1]. The World Management Survey (WMS), published in the Oxford Review of Economic Policy, found that public sector characteristics such as a lack of competitive pressure, resistance to change, and a highly traditional organizational culture are significant impediments to the adoption of modern management practices [2]. This causes the public sector to often lag in innovation adoption compared to the private sector, especially in the face of dynamics requiring rapid adaptation and responsiveness.

At the same time, the COVID-19 pandemic situation has demanded that the public sector act more responsively and agilely [3]. Many actions require quick decision-making by the government and the results affect the public. To overcome the dynamics that can complicate change, the principles and practices of Agile began to be adapted to government institutions [4]. Methodology Agile can change the way governments plan, operate, and deliver their products and services faster [3].

PMI Annual Global Survey 2024 on Project Management shows a trend of shifting from a predictive to a hybrid and agile approach in project management over the past 3 years, with predictions continuing. This was supported by an increase in the use of hybrid (57%) and agile (6%), as well as a decrease in predictive (24%) [5]. This iterative and collaborative Agile approach is considered more flexible in the face of uncertainty and allows organizations to adapt processes and strategies to changing needs.

Agile project management can help government organizations overcome the limitations of traditional project management approaches and improve project outcomes by encouraging flexibility. This flexibility allows the organization to allow for continuous feedback and adjustments throughout the project [6]. KPMG's survey report shows that 71% of agile methodologies respondents experience improved project completion. However, many organizations are still hampered in fully adopting agile due to a lack of skilled agile project leaders and low organizational maturity levels [1]. Getting into the concept of Agile In project management in the public sector not only impacts changes in the procurement process but also raises many other challenges in implementing the concept of Agile [4].

Agile principles, emphasizing flexibility, collaboration, and rapid response to change, offer significant benefits but conflict with the traditionally bureaucratic nature of public organizations. This contrast makes Agile adoption in the public sector a significant challenge, where rigid structures often hinder adaptability. [7]

The outlined challenges reveal a gap in the literature regarding Agile implementation in the public sector, particularly in adapting Agile approaches within traditional, highly bureaucratic project frameworks. Previous studies have identified specific challenges in Agile implementation within the public sector, such as the scope and changes in Agile project management [8], barriers and benefits of scaling agile project management for large projects [9], examines the challenges related to the human factor in agile software development projects [10], identifies the challenges and solutions in implementing agile transformation mapped using the TOEI framework [11]. Research [7] identified challenges and solutions in Agile implementation using eight PMBOK 7th edition project performance domains [12], with the biggest challenges in the Development Approach and Lifecycle and Project Work domains.

Due to the need for the public sector and further research related to this, the research questions are:

RQ 1: What are the challenges related to the Development Approach & Lifecycle and Project Work domains in implementing Agile project management in the public sector?

RQ 2: What practical solutions address the challenges related to the Development Approach & Lifecycle and Project Work domains in implementing agile project management in the public sector?

This research aims to address gaps and provide an in-depth view by identifying the challenges and best practice solutions for Agile implementation in the public sector, particularly within critical domains facing significant obstacles, Development Approach and Lifecycle Domain and Project Work Domain. Both domains play an essential role in Agile implementation in the public sector as they often face complex issues, especially in bureaucratic and rigid environments. By outlining the challenges and best practice solutions, this research will guide other public sector organizations looking to adopt Agile and support more flexible and responsive public service delivery.

MATERIALS AND METHODS

This research employed a Systematic Literature Review (SLR) approach following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. PRISMA provides a systematic framework that aids reviewers in transparently reporting the review rationale, methodology, and findings [13].

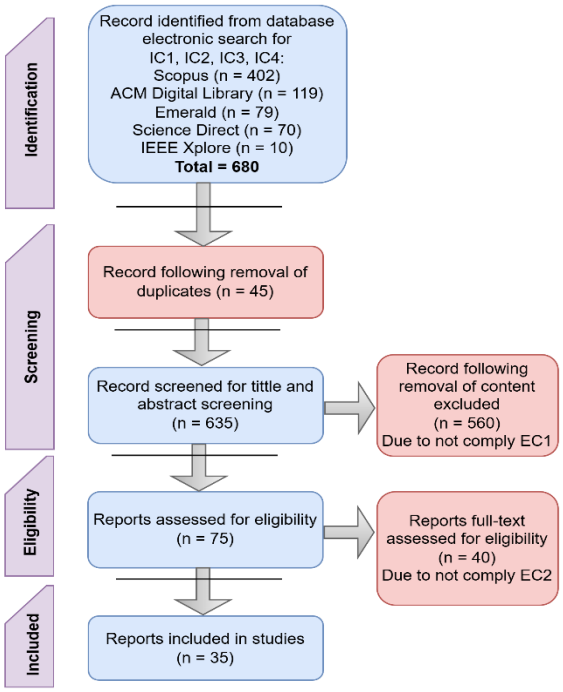
The data filtering process followed four stages: identification, screening, eligibility, and inclusion, as illustrated in Figure 1 (PRISMA SLR Diagram).

At the identification stage, searches were conducted on databases including Scopus, ACM Digital Library, Emerald, ScienceDirect, and IEEE Xplore using targeted keywords, such as "Development Approach & Lifecycle Performance Domain" and "Project Work Domain." Due to limited results, additional keywords like "common challenges of agile project management in the

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

public sector" were incorporated, using Boolean operators "AND" and "OR" to refine the search query: (("CHALLENGE" OR "FACTOR" OR "ISSUE" OR "PROBLEM" OR "LIMITATION" OR "OBSTACLE" OR "BENEFIT" OR "SUCCESS FACTOR") AND ("AGILE *PROJECT MANAGEMENT")* AND ("GOVERNMENT" OR "PUBLIC SECTOR" OR "PUBLIC ORGANIZATION" OR "BUREAUCRATIC ORGANIZATION")).



Source: (Research Results, 2024)
Figure 1. PRISMA SLR Diagram

The inclusion and exclusion criteria are listed in Table 1. Articles authored in English, published within the last five years (2020–2024), and available in full-text journal or proceedings format were included. Articles not specifically about Agile project management in the public sector or had little to do with the subjects of Project Work Domains and Development Approach & Lifecycle were not included. A quality test that thoroughly examined titles, abstracts, and keywords was used to determine relevancy.

In ensuring credibility in this study, the quality of each article was evaluated based on methodological rigor and relevance to Agile project management in a public sector context. A quality checklist was used based on inclusion criteria, such as describing the background, methodology, literature review, other related research, research results, and recommendations for future research. From this stage, the literature was selected, and the result was 35 papers that will be further analyzed for challenges and best practices.

Table 1. Inclusion and Exclusion Criteria

Criterion Name	Code	Criterion
Inclusion Criteria	IC1	Publications in the last five years, namely 2020-2024
	IC2	English-language publications
	IC3	Publication in the form of a journal or proceedings
	IC4	Complete publication and can be drawn in full *text.*
Exclusion Criteria	EC1	It is not related to agile project management in the public sector. The elimination process is done by screening titles, abstracts, and keywords do the elimination process.
	EC2	Less appropriate or less relevant to the topic of Development Approach and Lifecycle and Project Work Domains. The elimination process is done with a quality test to find the most suitable paper by reading the entire content of the paper.

Source: (Research Results, 2024)

Data extraction uses a coding framework that categorizes key information. The aim was to facilitate the systematic retrieval of relevant insights across papers. Thematic analysis was used to synthesize the gathered data, finding themes and patterns about the problems and solutions of Agile project management in public sector settings for both domains. These results were adapted to the respective contexts in both domains and mentioned in the PMBOK7th edition. Forty journals are used as literature review material for previous research that will be used in this study—the results of prior research as the main reference can be seen in Table 2.

Table 2. Previous Research as a Primary Reference

No.	Year	Database	Title	Citation
1	2023	Emerald	Prospects, drivers of, and barriers to artificial intelligence adoption in project management	[14]
2	2024	Emerald	Agile development for urban digitalisation: insights from the creation of Dresden's smart city strategy	[15]
3	2024	Emerald	Project governance: the impact of environmental changes on governance adaptations in large-scale projects	[16]
4	2023	Science Direct	Institutional Challenges in agile adoption: Evidence from a public sector IT project	[17]
5	2021	Science Direct	Organizational practices that enable and disable knowledge transfer: The case of a public sector project-based organization	[18]

No.	Year	Database	Title	Citation
6	2021	Science Direct	Specifics of the Agile Approach and Methods in Project management and its Use in Transport	[19]
7	2020	Science Direct	Exploratory analysis of cultural influences on requirements engineering activities based on stakeholders' profile	[20]
8	2024	Science Direct	The Pragmatic Comportment Compass: Rethinking projectification in public sector projects	[21]
9	2022	Scopus	Large-Scale Agile Transformations for Software Quality Assurance: An Empirical Case Study from Pakistan	[22]
10	2022	Scopus	A Novel Approach to Improving E-Government Performance from Budget Challenges in Complex Financial Systems	[23]
11	2023	Scopus	Identifying the relevant project management tools in implementation of e-governance projects - Journey from traditional to agile	[24]
12	2023	Scopus	Tailoring: A case study on applying the seventh principle of PMBOK 7 in a public institution.	[25]
13	2022	Scopus	Project management Office In The Public Sector: A Conceptual Roadmap	[26]
14	2023	Scopus	Differences between Public-Sector and Private-Sector Project management Practices in Hungary from a Competency Point of View	[27]
15	2022	Scopus	Study on the state of the art of critical success factors and project management performance	[28]
16	2021	Scopus	How to Outsource Agile Projects Effectively	[29]
17	2023	Scopus	Evaluation of the Infrastructure Project management System of Government Organizations and Suggestions for Their Improvement	[30]
18	2023	Scopus	Success factors for agile adoption in one of the ministries in Indonesia	[31]
19	2023	Scopus	Digital transformation success in the public sector: A systematic literature review of cases, processes, and success factors	[32]
20	2021	Scopus	Incorporating agile practices in public sector IT management: A nudge toward adaptive governance	[33]
21	2020	Scopus	Development of a hybrid agile management model in local self-government units	[34]
22	2023	Scopus	Challenges and Best Practices Solution of Agile Project Management in Public Sector: A Systematic Literature Review	[7]
23	2024	Scopus	Project management logics for agile public strategic management: Propositions from the literature and a research agenda	[35]
24	2024	Scopus	Analysis of project management principles with the Scrum framework in systems development: a case study in a public organization	[36]
25	2022	ACM Library	Agile Transformation Challenge and Solutions in Bureaucratic Government: A Systematic Literature Review	[11]
26	2020	ACM Library	Scaling agile software development approach in government organization in New Zealand	[37]
27	2022	ACM Library	Empirical Framework to Determine Maturity of Digital Transformation of a Service to Citizens through Enhancements on Existing Assessment Methods – Case Study India	[38]
28	2021	ACM Library	Navigating Public Values: How the Social Construction of Technology among Public Managers Defines the Nature of Public Values: Findings from a Japanese e-Government Project	[39]
29	2020	ACM Library	The Link Between Transformational and Servant Leadership in DevOps-Oriented Organizations	[40]
30	2020	ACM	Agility in public sector IT projects	[41]
31	2020	IEEE Xplore	Human-Related Challenges in Agile Software Development of Government Outsourcing Project	[10]
32	2020	IEEE Xplore	Agile-Based Requirement Challenges of Government Outsourcing Project: A Case Study	[42]
33	2024	IEEE Xplore	Assessing Requirements Engineering Practices' Impact on Electronic Government Solution Sustainability	[43]
34	2024	IEEE Xplore	Digital Transformation in Public Administrations: A Guided Tour for Computer Scientists	[44]
35	2024	IEEE Xplore	Digitalization of Document Management and Monitoring in the Department of the Interior and Local Government Negros Occidental	[45]

Source: (Research Results, 2024)

RESULTS AND DISCUSSION

This section discusses 35 previous studies reviewed from the last phase of SLR. This research analyzes the challenges in implementing Agile project management in the public sector related to the domains of Development Approach & Lifecycle and Project Work. The results of this analysis answer RQ 1 of the study and are contained in the discussion of subchapter A. After finding challenges for both domains, mapping the best practice solutions was carried out based on the analysis of

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

prior studies. This result answers RQ 2 of the research and is contained in the discussion of subchapter B.

A. List of Challenges by Category

Prior studies have analyzed the challenges of implementing Agile project management in the public sector for the domains of Development Approach & Lifecycle and Project Work. The results of the challenge analysis of the selected papers can be seen in Table 3. There is a citation column that displays the source of the challenge. The context column comes from the sub-discussion of the related domain, which is then mapped according to the challenges found. In prior research, both domains were not divided into several contexts, only in general. This research contributes novelty by identifying additional challenges within specific contexts. There are 32 challenges for both domains, of which 12 are in the Development Approach and Lifecycle domain, and 20 are in the Project Work Domains.

1. Development Approach & Lifecycle

In the development approach & lifecycle performance domain, the sub-discussions relevant to the challenges found are 1) Considerations for choosing a development approach and 2) Project life cycle and phases. In sub-discussion 1, the relevant contexts are organizational capability, organizational structure, schedule constraints, requirements certainty, risk, leader competencies, and culture. The challenges are found in the aspects of organizational capability and organizational structure. In the public sector, organizations experience difficulties in adopting agile methods, have minimal understanding, resistance to change, lack of flexibility, and complicated bureaucratic processes.

Traditional approaches in public organizations are rigid and systematic, so they do not support the dynamics of change that occur today, such as volatility, uncertainty, complexity, and ambiguity (VUCA) [31]. Not supporting the dynamics of change is related to the culture of the public sector, which is different from the private sector, such as a risk-averse culture. This indicates difficulties in adopting agile project management techniques to accommodate emerging changes. From the context of stakeholders (leader competencies), public officials have less awareness, support, and understanding of agile project management principles [11], [30], [40]. The team faced challenges in implementing the agile approach thoroughly without full support from top-level management. Addressing the gaps in previous research, this research identifies many recent challenges in the project lifecycle and phases. Challenges in this context were long release cycles, and focusing more on maintenance activities than new feature development [40]. The changes during the transition to Agile practices can demand significant adjustments in existing processes and workflows. Long release cycles and a focus on maintenance rather than new feature development can hinder an organization's ability to respond quickly to changes or community needs.

2. Project Work

The contexts examined within the Project Work domain in this study include learning throughout the project, communication and engagement, team focus, resource management, monitoring of new work and changes, and project processes. The Project Work domain is dominated by monitoring new work and changes, project processes, and procurement processes. The context of monitoring new work and change is dominated by the challenge of potential confusion and misunderstanding between stakeholders due to the lack of clear communication regarding project objectives, requirements, and changes [10]. The latest challenge identification that has not been identified in prior research is in the context of project process and procurement processes. The project process is dominated by the challenge of lack of accessibility to experts (practitioners) and agile training [10]. In the context of the procurement process, it is often not aligned with the principles of agile in terms of incremental delivery and changes in requirements [7]. In addition, the challenge of finding an outsourcing partner who has special expertise in agile project management in the public sector hinders the organization's ability to utilize external resources [29].

B. Problem Mapping Solutions

After finding challenges for both domains, the next thing is to map out the best practice solutions for each challenge. The solution is obtained from the analysis of previous studies and PMBOK 7th edition guidance. This is useful for opening insights from organizations and practitioners looking at implementing agile project management at earlier research. This does not rule out the possibility that other relevant solutions can be applied to each challenge. Each challenge can have more than one best-practice solution option. For example, in Development Approach & Lifecycle Performance Domain, for the challenge: of principles, bureaucratic processes, and organizational silos, the best practice solution that

can be applied is to simplify the bureaucratic process through the implementation of cross-functional teams from various departments and institutions [26], and build team collaboration to foster cooperation and coordination among diverse stakeholders in the government sector [27].

Another example is organizational capability, and there is a challenge in adopting agile project management techniques to accommodate emerging changes [31]. The PMO's Role in Agile Adoption as a centralized unit that promotes and facilitates agile practices within government organizations can address the best practice solution. They provide the structure and support necessary to implement agile methodologies effectively. PMOs can assist in managing the cultural and procedural changes required for agile adoption. They can guide and support teams transitioning to agile, helping them accommodate emerging changes more effectively by fostering an environment of continuous improvement and learning [26].

The results of the challenge analysis and detailed mapping of best practice solutions for the Development Approach & Lifecycle Performance domain can also be seen in Table 3, and the Project Work domain can be seen in Table 4.

Table 3. Challenges and Solutions for Development Approach & Lifecycle Performance Domain

No.	Context	Challenge	Citations	Best Practice Solutions
1	Organizational capability	Difficulties in adopting agile project management techniques in accommodating emerging changes	[22], [25], [26], [31], [32], [33]	Forming a dedicated work unit such as the Center of Excellence Agile or Project management Offices (PMOs) responsible for promoting and facilitating the adoption of practices Agile in government organizations [26]
2	Organizational capability	The lack of understanding of using agile methods in the public sector makes it difficult to determine the best solution for software development in government organizations.	[22], [37]	Seek consulting services or collaborate with practitioners or organizations that are experienced in applying Agile methodologies in the public sector [15]
3	Organizational capability	Resistance to changes to agile software development methods	[10], [20], [22], [25], [26], [30], [38], [31], [33], [40], [41]	Implementing a structured change management strategy and encouraging a mindset to accept change and innovation. [36]
4	Organizational structure	Principles, bureaucratic processes, and organizational silos are contrary to agile practices and make it difficult to coordinate and collaborate between departments and institutions	[7], [22], [41], [25], [26], [28], [30], [31], [38], [40], [41]	- Simplifying bureaucratic processes through the implementation of cross-functional teams from various departments and institutions [26] - Building team collaboration to foster cooperation and coordination among diverse stakeholders in the government sector [27]
5	Organizational structure	Lack of flexibility in rigid government processes and regulations	[7], [24], [25], [26], [28], [30], [31], [32], [34], [38], [41]	Revise government policies and regulations to accommodate practices Agile [30]
6	Schedule Constraints - Project time management	Spending too much time on project discussion or troubleshooting between vendors and government clients	[38]	- Leverage project management tools and technologies to facilitate communication, track progress, and identify and resolve issues promptly. - Establish clear project goals, requirements, and schedules upfront to minimize the need for extensive discussion and problem-solving. - Implement an efficient decision-making process [38]
7	Requirements certainty	There is a mismatch between Agile practices and conventional funding, governance, and rigid project management methods.	[17], [40]	Develop a more flexible policy framework that accommodates the nature of Agile iterative and adaptive [17]
8	Risk	An appropriate approach is needed to manage risk-related projects	[19], [32]	Implement a proactive risk management approach through a thorough risk assessment at the beginning of the project, monitoring and evaluating risks throughout the project cycle [17]
9	Culture	The public sector has a culture that is different from the private sector, such as a risk-averse culture.	[7], [20], [26], [27], [34], [37]	Fostering culture Agile through a mindset shift to accept change, where they see challenges as opportunities to learn and grow [26]

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

No.	Context	Challenge	Citations	Best Practice Solutions
10	Stakeholder (Leader competencies)	Lack of awareness, support, and understanding of agile project management principles and methodologies among government officials	[11], [30], [40]	Conduct training programs and workshops to educate government officials on the principles and benefits of project management Agile [30]
11	Project life cycle and phases	Customize processes and workflows to support changing needs during the project lifecycle	[43]	- Implement the Scrum framework to manage change during system development through planned iterations (sprints) that provide flexibility to adjust processes and workflows as needs change throughout the project cycle. [45] - Manage the project lifecycle by implementing the concept of incremental delivery, i.e., small components sequentially to accommodate changing needs. [15]
12	Project life cycle and phases	Long release cycles and focus on maintenance activities rather than developing new features	[40]	Making the transition to practice Agile by combining it with IT management guidelines such as Information Technology Infrastructure Library (ITIL) [40]

Source: (Research Results, 2024)

Table 4. Challenges and Best Practice Solutions for Project Work Domain

No.	Context	Challenge	Citations	Best Practice Solutions
1	Learning Throughout the Project	Lack of focus on knowledge transfer practices in Project-Based Organizations (PBOs) in the public sector.	[11], [18]	- Fostering a collaborative environment that encourages team members to leverage formal and informal knowledge transfer practices based on the specific needs of each project [18] - Encourage collaboration and knowledge sharing among government agencies to learn from successful project management implementations and share best practices [26]
2	Project-wide learning	Management decisions in the public sector often assume that orders to learn and create new knowledge are given from above.	[11]	Conducting collaboration workshops with cross-functional teams to ensure effective workflow adjustments during the transition phase. [45]
3	Communication and involvement in the project, Team focus.	Lack of commitment and active involvement of Product Owner and team members	[10], [11], [37]	Establish clear roles and responsibilities for Product Owners and team members, emphasizing their active involvement throughout the project [37]
4	Communication and Engagement in Projects	Tensions and conflicts related to project approval, policies, governance, and culture in project settings	[17]	Implementing change mechanisms such as "mission collaborators" and "one-team culture" can help overcome tensions [17]
5	Communication and involvement in the project	Limited stakeholder engagement and communication gaps	[25], [32], [41], [42]	Fostering collaboration and communication between advisors from the client side and outsourcing partners throughout the project cycle [29]
6	Resource Management	Dependency occurs because team members have specific skills and cannot substitute for each other.	[16]	- Implement periodic job rotation practices to allow team members to learn the skills of their peers. - Conduct cross-functional training to ensure team members can handle the primary responsibilities of other peers. [16]
7	Resource Management	Lack of resources, including staff, technology, infrastructure, and less capable equipment	[11], [23], [30], [39]	- Implement a resource management strategy that focuses on optimizing the utilization of available resources and identifying gaps or shortcomings that need to be addressed. [26]
8	Procurement processes	Procurement processes are not aligned with *agile principles* regarding incremental delivery and changing requirements.	[7], [41], [21]	Develop procurement models that support Agile principles, such as outcome-based contracts. [35]
9	Procurement process	It is challenging to set a contract period due to differences of interest and misalignment due to	[36]	Implement a collaborative and iterative approach to contract negotiation and management, allowing flexibility

No.	Context	Challenge	Citations	Best Practice Solutions
		the misalignment between the need for improvement in software development and rigid traditional procurement procedures		and adaptability to changing project needs and priorities. [29]
10	Procurement processes	Longer approval process and procurement process	[24]	- Simplify the approval process by implementing *agile* governance practices that enable faster decision-making - Utilizing technology solutions such as e-procurement or digital collaboration tools [29]
11	Procurement processes	It is difficult to find a suitable outsourcing partner who has *agile project management* expertise in the public sector	[29]	- Establish a comprehensive vendor evaluation process that includes an assessment of the outsourcing partner's experience and expertise in project management *Agile* [29]
12	Project Process – Decision Making	The complicated decision-making process of bureaucratic procedures can slow down the progress of the project.	[11], [14], [26]	Encourage transparent communication channels through Scrum or Kanban for project teams and stakeholders that facilitate timely decision-making and reduce the need for excessive bureaucracy. [26]
13	Project Process – Competencies and Training	Lack of accessibility to experts (practitioners) and *agile training*	[10], [7], [22], [23], [25], [26], [28], [32], [38]	Establish a network of Agile mentors in public institutions to support the implementation of Agile frameworks in digitalization projects. [44]
14	Project Process – Transparency	Government projects often involve many stakeholders with different priorities and interests	[38]	Establish a clear and shared vision for the project to align the priorities and interests of all stakeholders. [38]
15	Project Process – Integration	Difficulty in integrating Agile tools with formal standards, project control tools, and lack of frameworks that ensure alignment between initial requirements and final deliverables	[43], [16], [36]	Integrate scrum tools such as backlog tracking and burn-down charts with formal standards for requirements tracking and project monitoring. [36]
16	Project Process – Project Documentation	Government projects require extensive documentation and reporting, which can be time-consuming	[24]	A continuous learning and improvement mindset is important for receiving feedback and incorporating lessons learned in future projects. [27]
17	Monitoring of new jobs and changes	Potential confusion and misunderstanding among stakeholders due to a lack of clear communication regarding project objectives, requirements, and changes	[10], [7], [26], [29], [32]	Engage stakeholders early and frequently to ensure their buy-in and alignment with agile project management principles and practices. [26]
18	Monitoring of new jobs and changes	There is a need for additional time to address changes in scope and expectations, which can impact project schedules and budgets	[7]	The concept of pragmatic comportment provides an alternative framework that supports flexibility, adaptability and communication. This includes changes in project scope and stakeholder expectations. [21]
19	Monitoring of new jobs and changes	Difficulties in managing project scope and requirements in a dynamic and ever-evolving government project environment, such as over-scoping, unrealistic expectations	[28], [29], [32], [42]	- Clearly define and document the project scope and requirements at the beginning of the project - Implementing a change management process that allows for controlled and documented changes to the project scope, ensuring that any changes are correctly evaluated, approved, and communicated to all stakeholders [42]
20	Monitoring of new jobs and changes	The emergence of various subprojects within a single government project	[39]	- Establish a centralized coordination mechanism to ensure effective communication and collaboration between different subprojects - Assign a project manager or dedicated team responsible for overseeing coordination and integration efforts, ensuring that all subprojects are aligned with the overall project goals and objectives [39]

Source: (Research Results, 2024)

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

C. Research implications

This research has academic implications by providing the latest literature on the challenges of agile project management and best practice solutions in the public sector. The state-of-the-art of this research lies in the results of exploring challenges and best practice solutions of PMBOK 7th edition, especially the deepening of the aspects of the Development Approach and Lifecycle and Project Work Domains. Exploring these two domains helps fill the knowledge gaps with a specific focus on these areas. It provides an up-to-date and relevant overview of agile project management science development.

The results of this research can help organizations gain insights into agile applications so that they can increase the effectiveness of implementing agile project management practices in the public sector.

CONCLUSION

This study explores the challenges and solutions of agile project management best practices in specific project performance domain categories PMBOK 7th edition, namely Development Approach and Lifecycle domain and Project Work Domain. The goal is to provide a more focused and in-depth view that allows organizations and practitioners to gain more specific and applicable insights related to Agile project management in the public sector. The method used in searching for previous research is SLR PRISMA. Identify through online searches on Scopus databases, ACM Digital Library, Emerald, ScienceDirect, and IEEE Xplore. Of the total 680 papers found, 35 papers are used as material for reviewing previous research literature used in exploring challenges and best practice solutions.

There are 32 challenges for both domains, of which the Project Work Domain has the most difficulties with 20 challenges, and the Development Approach and Lifecycle domain has 12 challenges. In the Development Approach & Lifecycle Performance Domain, the most challenges are in the context of organizational capability and organizational structure. In the public sector, organizations experience difficulties in adopting agile methods, have minimal understanding, resistance to change, lack of flexibility, and complicated bureaucratic processes. The Project Work domain is dominated by monitoring new work and changes, project processes, and procurement processes. The context of monitoring new work and change is dominated by the challenge of potential confusion and misunderstanding among stakeholders due to the lack of clear communication regarding project objectives, requirements, and changes. The context of the project process is dominated by the challenge of lack of accessibility to experts (practitioners) and agile training. In the context of the procurement process, it is often not aligned with agile principles in terms of incremental delivery and changing requirements.

After finding challenges for both domains, the best practice solutions for each challenge are mapped based on the analysis of previous studies and PMBOK 7th edition. In response to Development Approach & Lifecycle Performance Domain challenges, organizations need to establish dedicated work units such as Agile Centers of Excellence or Project management Offices (PMOs) that are responsible for facilitating the adoption of Agile practices in government organizations, change management and encouraging a mindset to embrace change and innovation. Seeking consulting services from experienced practitioners or organizations, revising government policies to accommodate Agile practices, and streamlining bureaucratic processes are also best practices that can be implemented. In responding to solutions to Project Work Domain challenges, organizations should engage stakeholders early and continuously, maintaining open communication to stay informed of changes. To strengthen coordination, a centralized mechanism and appointing a dedicated project manager are recommended to keep sub-projects aligned with the primary goal. Procurement processes also need to be streamlined to support the iterative nature of Agile, including collaborative approaches to contract negotiation that are flexible and adaptive to changing needs. The implementation of agile governance, supported by technology such as e-procurement and digital collaboration tools, is also needed to speed up decision-making and efficiency of resource procurement.

These solutions help open the organization's insight and lessons learned into implementing agile project management in previous research. This research is expected to guide other government agencies that want to adopt Agile, supporting more flexible and responsive public service delivery. This does not rule out the possibility that other relevant solutions can be applied to existing challenges. The limitation of this study is that it is limited to English-language research published between 2020 and 2024. Therefore, relevant literature in other languages may not be identified. There may be organizations in the public sector that are not suitable for implementing best practices based on

the results of previous research. Further research can be carried out in other categories of PMBOK 7th edition of the project performance domain to deepen knowledge in different specific areas. In addition, future research in the form of case studies on public organizations is also needed to deepen the understanding and real-life findings. This can be enriched by focusing on the challenges that dominate the Project Work domain, such as monitoring new work and changes, project processes, and procurement processes. This research can also be conducted for the private sector to provide insights for private companies to optimize the implementation of Agile project management and utilize best practices to achieve their business and operational goals.

REFERENCE

[1] Project Management Institute and KPMG, "2022 Project Management Survey," pp. 1–18, 2023.

[2] D. Scur, R. Sadun, J. Van Reenen, R. Lemos, and N. Bloom, "The World Management Survey at 18: lessons and the way forward," *Oxford Rev. Econ. Policy*, vol. 37, no. 2, pp. 231–258, Jun. 2021, doi: 10.1093/oxrep/grab009.

[3] H. Dib, A. Di Lodovico, J. Sengupta, A. Lamaa, and D. Mahadevan, "Better and faster: Organizational agility for the public sector." [Online]. Available: https://www.mckinsey.com/industries/public-sector/our-insights/better-and-faster-organizational-agility-for-the-public-sector

[4] W. D. Eggers and J. O'Leary, "When Agile meets government." [Online]. Available: https://www2.deloitte.com/us/en/insights/industry/public-sector/agile-in-government-culture-shift.html

[5] Project Management Institute, "Pulse of the Profession 2024 - The Future of Project Work: Moving Past Office-Centric Models," 2024, [Online]. Available: https://www.pmi.org/learning/thought-leadership/pulse/future-of-project-work

[6] M. Bogdanova, E. Parashkevova, and M. Stoyanova, "Agile Project Management In Public Sector - Methodological Aspects," *J. Eur. Econ.*, vol. 19, no. Vol 19, No 2 (2020), pp. 283–298, Jun. 2020, doi: 10.35774/jee2020.02.283.

[7] P. P. Abdullah, T. Raharjo, B. Hardian, and T. Simanungkalit, "Challenges and Best Practices Solution of Agile Project Management in Public Sector: A Systematic Literature Review," *Int. J. Informatics Vis.*, vol. 7, no. 2, pp. 606–614, 2023, doi: 10.30630/joiv.7.2.1098.

[8] P. Marnada, T. Raharjo, B. Hardian, and A. Prasetyo, "Agile project management challenge in handling scope and change: A systematic literature review," *Procedia Comput. Sci.*, vol. 197, pp. 290–300, 2022, doi: https://doi.org/10.1016/j.procs.2021.12.143.

[9] P. O. Santos and M. M. de Carvalho, "Exploring the challenges and benefits for scaling agile project management to large projects: a review," *Requir. Eng.*, vol. 27, no. 1, pp. 117–134, 2022, doi: 10.1007/s00766-021-00363-3.

[10] A. K. Nisyak, K. Rizkiyah, and T. Raharjo, "Human Related Challenges in Agile Software Development of Government Outsourcing Project," in *2020 7th International Conference on Electrical Engineering, Computer Sciences and Informatics (EECSI)*, 2020, pp. 222–229. doi: 10.23919/EECSI50503.2020.9251899.

[11] H. Dwi Harfianto *et al.*, "Agile Transformation Challenges and Solutions in Bureaucratic Government: A Systematic Literature Review," in *Proceedings of the 2022 5th International Conference on Computers in Management and Business*, in ICCMB '22. New York, NY, USA: Association for Computing Machinery, 2022, pp. 12–19. doi: 10.1145/3512676.3512679.

[12] PMI, "Project Performace Domain." [Online]. Available: https://www.pmi.org/-/media/pmi/documents/public/pdf/pmbok-standards/pmbok-project-performance-domains.pdf?v=ffd77553-1316-424f-83d1-83c95469ce2c#:~:text=The Development Approach %26 Life Cycle,cycle phases of the project.

[13] M. J. Page *et al.*, "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews," *J. Clin. Epidemiol.*, vol. 134, pp. 178–189, 2021, doi: 10.1016/j.jclinepi.2021.03.001.

[14] G. Shang, S. P. Low, and X. Y. V Lim, "Prospects, drivers of and barriers to artificial intelligence adoption in project management," *Built Environ. Proj. Asset Manag.*, vol. 13, no. 5, pp. 629–645, 2023, doi: 10.1108/BEPAM-12-2022-0195.

[15] J. R. Noennig, F. Mello Rose, P. Stadelhofer, A. Jannack, and S. Kulashri, "Agile development for urban digitalisation: insights from the

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5654

creation of Dresden's smart city strategy," *Meas. Bus. Excell.*, vol. 28, no. 2, pp. 193–208, May 2024, doi: 10.1108/MBE-09-2023-0142.

[16] L. Ika, J. Meredith, and O. Zwikael, "Project governance: the impact of environmental changes on governance adaptations in large-scale projects," *Int. J. Manag. Proj. Bus.*, vol. 17, no. 4/5, pp. 829–854, Sep. 2024, doi: 10.1108/IJMPB-03-2024-0056.

[17] D. Baxter, N. Dacre, H. Dong, and S. Ceylan, "Institutional challenges in agile adoption: Evidence from a public sector IT project," *Gov. Inf. Q.*, vol. 40, no. 4, p. 101858, 2023, doi: https://doi.org/10.1016/j.giq.2023.101858.

[18] A. Mahura and G. Birollo, "Organizational practices that enable and disable knowledge transfer: The case of a public sector project-based organization," *Int. J. Proj. Manag.*, vol. 39, no. 3, pp. 270–281, 2021, doi: https://doi.org/10.1016/j.ijproman.2020.12.002.

[19] J. Šimíčková, K. Buganová, and E. Mošková, "Specifics of the Agile Approach and Methods in Project Management and its Use in Transport," *Transp. Res. Procedia*, vol. 55, pp. 1436–1443, 2021, doi: https://doi.org/10.1016/j.trpro.2021.07.130.

[20] T. Alsanoosy, M. Spichkova, and J. Harland, "Exploratory analysis of cultural influences on requirements engineering activities based on stakeholders' profile," in *Procedia Computer Science*, 2020, pp. 3379–3388. doi: 10.1016/j.procs.2020.09.059.

[21] K. M. Rowe, S. J. Whitty, and A. L. Wheeldon, "The Pragmatic Comportment Compass: Rethinking projectification in public sector projects," *Proj. Leadersh. Soc.*, vol. 5, p. 100152, Dec. 2024, doi: 10.1016/j.plas.2024.100152.

[22] K. Wadood, N. Nigar, M. K. Shahzad, S. Islam, A. Jaleel, and D. Abalo, "Large-Scale Agile Transformations for Software Quality Assurance: An Empirical Case Study from Pakistan," *Math. Probl. Eng.*, vol. 2022, 2022, doi: 10.1155/2022/6153744.

[23] E. Lulaj, I. Zarin, and S. Rahman, "A Novel Approach to Improving E-Government Performance from Budget Challenges in Complex Financial Systems," *Complexity*, vol. 2022, 2022, doi: 10.1155/2022/2507490.

[24] G. Chandrachooodan, R. Radhika, and R. R. Palappan, "Identifying the relevant project management tools in implementation of e-governance projects - Journey from traditional to agile," in *AIP Conference Proceedings*, 2023. doi: 10.1063/5.0119802.

[25] M. C. Rodrigues, L. Domingues, and J. P. Oliveira, "Tailoring: A case study on the application of the seventh principle of PMBOK 7 in a public institution.," in *Procedia Computer Science*, 2023, pp. 1735–1743. doi: 10.1016/j.procs.2023.01.468.

[26] V. Obradović, "PROJECT MANAGEMENT OFFICE IN THE PUBLIC SECTOR: A CONCEPTUAL ROADMAP," *Eur. Proj. Manag. J.*, vol. 12, no. 2, pp. 63–70, 2022, doi: 10.56889/ghxu9566.

[27] B. Blaskovics, Z. M. Maró, G. Klimkó, V. Papp-Horváth, and Á. Csiszárik-Kocsir, "Differences between Public-Sector and Private-Sector Project Management Practices in Hungary from a Competency Point of View," *Sustain.*, vol. 15, no. 14, 2023, doi: 10.3390/su151411236.

[28] G. S. Pereira, O. Novaski, N. F. dos Santos Neto, and F. D. A. da Silva Mota, "Study on the state of the art of critical success factors and project management performance," *Gest. e Prod.*, vol. 29, 2022, doi: 10.1590/1806-9649-2022v29e4722.

[29] A. Aoufi, M. Schoeman, and N. Turner, "How to Outsource Agile Projects Effectively: Suppliers and client advisors need to work closely with client organizations to ensure key enablers are in place to increase success when outsourcing Agile projects.," *Res. Technol. Manag.*, vol. 65, no. 1, pp. 59–66, 2021, doi: 10.1080/08956308.2022.1987792.

[30] O. P. Tripathi, A. K. Jain, and K. N. Jha, "Evaluation of the Infrastructure Project Management System of Government Organizations and Suggestions for Their Improvement," *J. Leg. Aff. Disput. Resolut. Eng. Constr.*, vol. 15, no. 1, 2023, doi: 10.1061/(ASCE)LA.1943-4170.0000562.

[31] D. Fransisca, T. Raharjo, B. Hardian, and A. Suhanto, "Success factors for agile adoption in one of the ministries in Indonesia," in *AIP Conference Proceedings*, 2023. doi: 10.1063/5.0114847.

[32] F. Escobar, W. H. C. Almeida, and J. Varajão, "Digital transformation success in the public sector: A systematic literature review of cases, processes, and success factors," *Inf. Polity*, vol. 28, no. 1, pp. 61–81, 2023, doi: 10.3233/IP-211518.

[33] M. Ylinen, "Incorporating agile practices in

public sector IT management: A nudge toward adaptive governance," *Inf. Polity*, vol. 26, no. 3, pp. 251–271, 2021, doi: 10.3233/IP-200269.

[34] D. Car-Pušić, I. Marović, and G. Bulatović, "Development of a hybrid agile management model in local self-government units," *Teh. Vjesn.*, vol. 27, no. 5, pp. 1418–1426, 2020, doi: 10.17559/TV-20190205140719.

[35] A. Bonomi Savignon and L. Costumato, "Project management logics for agile public strategic management: Propositions from the literature and a research agenda," *Inf. Polity*, vol. 29, no. 2, pp. 153–178, Jun. 2024, doi: 10.3233/IP-230061.

[36] J. de S. Pinto and R. da S. Leme, "Analysis of project management principles with the Scrum framework in systems development," *Brazilian J. Oper. Prod. Manag.*, vol. 21, no. 2, p. 1878, Apr. 2024, doi: 10.14488/BJOPM.1878.2024.

[37] D. Ghimire, S. Charters, and S. Gibbs, "Scaling agile software development approach in government organization in New Zealand," in *ACM International Conference Proceeding Series*, 2020, pp. 100–104. doi: 10.1145/3378936.3378945.

[38] S. Prakash, "Empirical Framework to Determine Maturity of Digital Transformation of a Service to Citizens through Enhancements on Existing Assessment Methods – Case Study India," in *Proceedings of the 15th International Conference on Theory and Practice of Electronic Governance*, in ICEGOV '22. New York, NY, USA: Association for Computing Machinery, 2022, pp. 301–308. doi: 10.1145/3560107.3560154.

[39] F. Gualdi and K. Idemitsu, "Navigating Public Values: How the Social Construction of Technology among Public Managers Defines the Nature of Public Values: Findings from a Japanese e-Government Project," in *DG.O2021: The 22nd Annual International Conference on Digital Government Research*, in DG.O'21. New York, NY, USA: Association for Computing Machinery, 2021, pp. 398–407. doi: 10.1145/3463677.3463723.

[40] K. Maroukian and S. R. Gulliver, "The Link Between Transformational and Servant Leadership in DevOps-Oriented Organizations," in *Proceedings of the 2020 European Symposium on Software Engineering*, in ESSE '20. New York, NY, USA: Association for Computing Machinery, 2020, pp. 21–29. doi: 10.1145/3393822.3432340.

[41] M. Dietel and M. Heine, "Agility in public sector IT projects," in *ACM International Conference Proceeding Series*, 2020, pp. 803–806. doi: 10.1145/3428502.3428625.

[42] K. Rizkiyah, A. K. Nisyak, and T. Raharjo, "Agile-Based Requirement Challenges of Government Outsourcing Project: A Case Study," in *2020 3rd International Conference on Computer and Informatics Engineering (IC2IE)*, 2020, pp. 267–273. doi: 10.1109/IC2IE50715.2020.9274659.

[43] A. Alzayed, "Assessing Requirements Engineering Practices' Impact on Electronic Government Solution Sustainability," in *2024 4th International Conference on Innovative Research in Applied Science, Engineering and Technology (IRASET)*, IEEE, May 2024, pp. 1–8. doi: 10.1109/IRASET60544.2024.10549276.

[44] P. Ciancarini, R. Giancarlo, and G. Grimaudo, "Digital Transformation in the Public Administrations: A Guided Tour for Computer Scientists," *IEEE Access*, vol. 12, pp. 22841–22865, 2024, doi: 10.1109/ACCESS.2024.3363075.

[45] B. A. Rodriguez, V. T. Aquiatan, C. J. A. Verallo, S. B. Agpad, R. C. De Loyola, and E. J. P. Bibangco, "Digitalization of Document Management and Monitoring in the Department of the Interior and Local Government Negros Occidental," in *2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, IEEE, Jun. 2024, pp. 1–8. doi: 10.1109/ICCCNT61001.2024.10724748.

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri