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A Systematic Review of the Aspects and Benefits Agile Project Management Innovation

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Abstract

Agile Project Management (APM) has developed throughout industries for years. Many companies chose APM for their initiatives. APM has been shown to help those who use it. Many APM adopters innovated and tailored the methodology. Innovation improved project agility. Innovation includes life cycle and development approach selection, processes, involvement, tools, methodologies, and artifacts. This study performed a Kitchenham-based systematic literature review in three steps: planning, conducting, and reporting systematic review. The 23 articles were chosen from ACM Digital Library, EBSCOhost, IEEE Xplore, Sage Journals, ScienceDirect, and Semantic Scholar. Journal articles or conference papers were possible. The findings of this study showed that PMBOK 7th Edition could map all previous studies into related innovation aspects. Then, the review demonstrated that each innovation improved the PMBOK 7th Edition performance domain. Finally, this study showed that organization-driven innovation could benefit the organization.

A. Introduction

For many years, Agile Project Management (APM) has been popular in various industries as a realistic and adaptable approach to project management [1], [2]. The use of APM in organizations for project approaches continues to increase yearly. In a survey called The 16th Annual State of Agile Report in 2022, 80% of respondents used Agile practices to drive software development in their organizations, with 52% saying that Agile could accelerate the time a product to market [3]. The improvements to the product delivery lifecycle are still being recognized, but the benefits of an Agile approach are apparent. Thus, it is being applied across more of the organization. Therefore, Agile is expected to improve business value and the capacity to quantify it to appear regularly [4]. Higher-quality products are needed to accommodate the rise in demand and higher customer expectations [5]. Then, the use of APM methodology has revolutionized and helped to sustain the efficacy of the project management process.

APM is an approach that drives stakeholders' collaboration, communication, and coordination together for change adaptation, then it could develop innovative products [6]. APM helped projects succeed by maximizing the use of technology, faster adaptation to market competition, and project agility based on customer requirements. As a result, organizations could develop the best solutions with faster delivery in the face of constant change [7]. The ability to gather change is a success factor. To handle difficult challenges in an age of increasing disruption, an organization must be nimble to solve problems. Most business leaders have heard of Agile innovation teams, which are supposed to stay close to customers and react swiftly to changing business conditions [8].

The importance of project agility has been recognized to gain a competitive advantage [9]. However, the adoption of Agile as a management style for IT development projects has allowed for some degree of such creativity, but organizations should understand what innovation requirements could improve innovation [5]. The answer, organizations need to adopt and fully support Agile methodology as a project management approach. Agile enables innovation, and innovation drives organizational agility responses.

Innovation is also called tailoring in many cases. Tailoring in a project environment considers the processes, deliverables, project life cycle, development method, and people with whom to collaborate [10]. Tailoring is done to better suit the needs of the organization, the project needs, and the operating environment. Organizations gain from tailoring in both direct and indirect ways. These include but are not limited to, increased commitment from project team members who assisted in tailoring the approach, more efficient use of project resources, and a customer-oriented emphasis, as client needs are an essential influencing factor in its development. In PMBOK 7th edition, the innovation and tailored project aspects include process, engagement, lifecycle and development approach, methods and artifacts, and tools.

Based on the background and problem statement, this study has two research questions that have been developed.

RQ1. What aspects of the APM innovation were carried out in previous studies related to the PMBOK 7th Edition?

RQ2. What are the benefits of the APM innovation that have been made related to the PMBOK 7th Edition performance domain?

This study is a systematic literature review article that aims to understand the aspects of APM innovation that have been used by organizations to adapt Agile methodology for project management and map the benefits of APM innovation to the performance domain of PMBOK 7th edition.

Subsequently, the ensuing sections of the document are organized in the following manner. The second section describes the research methodology. The fourth section presents findings and discussions. The final section describes the conclusion of this study.

Previous Works

There were many previous works in systematic literature reviews conducted about APM. Most of them focused on APM in general, but a little attention to how APM innovated and tailored for an organization. There was a knowledge gap in the sector regarding how to embrace innovation [5]. Then, a study of systematic review in APM innovation and tailoring could increase understanding of how to innovate APM and then get benefits from that.

First, Marnada et al. [1] conducted a systematic literature review to describe challenges in handling scope and changing APM practice. SLR was carried out from many databases, namely IEEE Xplore, Emerald Insight, ScienceDirect, Wiley Online, and ProQuest. The results of SLR found that the most important challenges are user requirement prioritization, communication and coordination, over-scope requirements, and people and organization. The impact of those challenges was overspending and delays in the project.

Second, Raharjo and Purwandari [8] performed a systematic literature review to map APM challenges and solutions based on PMBOK, Agile practice guide, PRINCE2 Agile, and other references related to APM. SLR used previous studies in many databases, namely Emerald Insight, IEEE Xplore, Project Management Institute, ScienceDirect, and ProQuest. The result of SLR showed that the primary challenge originated from stakeholder management. This encompasses challenges related to Agile transition, Agile adaptation, and transformation. Additional challenges encompassed project integration management, project schedule management, project resource management, and project scope management.

Third, Trier and Treffers [11] carried out a systematic literature review to discuss enablers behind the integration of APM in audio-visual industries including music, mobile content, motion picture, and video gaming. SLR was performed using related articles from EBSCOhost, Google Scholar, Web of Science, and Jstor. The result of SLR presented that there were 11 APM enablers in related industries. The APM enablers are divided into three categories, such as project, team, and culture. In the project category, the APM enablers were the integration of digital tools, customer voice integration, decision-making power, and feedback and review process. From the team category, the APM enablers were multidisciplinary project teams, virtual project teams, organizational structure, and project team passion. Last, in the culture category, the APM enablers were needed for speed, creative freedom, communication, and culture.

Fourth, Noteboom et al. [6] conducted a systematic literature review to investigate the drivers that drove adoption and critical success factors that impacted the success of APM. Additionally, recommendations would be provided for developing best practices in APM. SLR carried out previous studies from ACM Digital Library, IEEE Xplore, ABI/Inform, and EBSCO Host. The result of SLR found that there were 11 adoption drivers and 13 critical success factors. Those results were divided into three categories by project dimension, such as culture, project, and team. The adoption driver themes that supported APM adoption were frequent changes, product quality, dedicated and available teams, team size, management buy-in, dynamic product definition and effort estimation, product delivery parameters, communication and collaboration, team expertise, leadership, and organizational setup and climate. The critical success factor themes that affected the success of APM were frequent changes, product delivery parameters, collaboration and communication, team expertise, leadership, management buy-in, dynamic product definition and effort estimation, acceptance criteria, customer satisfaction, work distribution amongst team members, dedicated and available teams, team size, and employee training.

Fifth, Ciric et al. [7] performed a systematic literature review to provide a comprehensive overview and evaluative analysis of prior research and established understanding regarding the feasibility of applying APM in domains beyond the software industry, as well as its compatibility with Traditional Project Management (TPM) methodologies. Additionally, the study sought to identify the potential benefits and challenges associated with implementing APM in the context of innovation and the new development process of products. SLR used works of literature from ScienceDirect, ProQuest, Emerald Insight, Scopus, ACM Digital Library, EBSCO Host, and IEEE Xplore. The result of SLR showed that the most benefit of APM came from domain innovation management and product development, then the others were real estate and construction, education, and services. Innovation and new development processes in the domain of the product also had benefits and drawbacks, which was the challenge of the hybrid project management approach.

PMBOK 7th Edition Tailoring

Tailoring refers to the intentional modification of project management methodologies, governance structures, and operational procedures to better align with a given project's specific context and requirements [10]. The tailoring process entailed comprehending a given project's contextual factors, objectives, and operational milieu. Projects were conducted in intricate settings that required the management of various potentially conflicting demands. These demands might be included but were not restricted to, the prompt delivery of project outcomes, the minimization of project expenses, the maximization of the value delivered, the production of high-quality deliverables and results, the adherence to regulatory standards, the fulfillment of diverse stakeholder expectations, and the ability to adapt to changes. It was imperative to comprehend, assess, and harmonize these variables to establish a pragmatic operational milieu for the project.

The practice of tailoring confers both direct and indirect advantages to organizations. The factors mentioned above encompass, though are not limited to,

augmented dedication from project team members who contributed to customizing the approach, focusing on customer-centricity, given that the customer's requirements are a crucial determinant in its evolution and more optimal utilization of project resources [10]. The tailored aspects of a project encompassed various factors such as processes, tools, engagement, artifacts, and methods, as well as the selection of life cycle and development approach.

PMBOK 7th Edition Performance Domain

A project performance domain refers to a cluster of interrelated activities deemed essential for efficiently and effectively delivering project outcomes [10]. The domains of project performance were mutually dependent and interconnected areas of concentration that collaborated to attain the intended project results. The project performance was categorized into eight domains, namely team, planning, delivery, uncertainty, stakeholders, development approach and life cycle, project work, and measurement. The performance domains, when taken collectively, constitute a cohesive entity. The performance domains function as a coherent system, wherein the success of project delivery and its desired outcomes relies on each performance domain's interdependence. Figure 1 below shows eight project performance domains based on PMBOK 7th Edition.

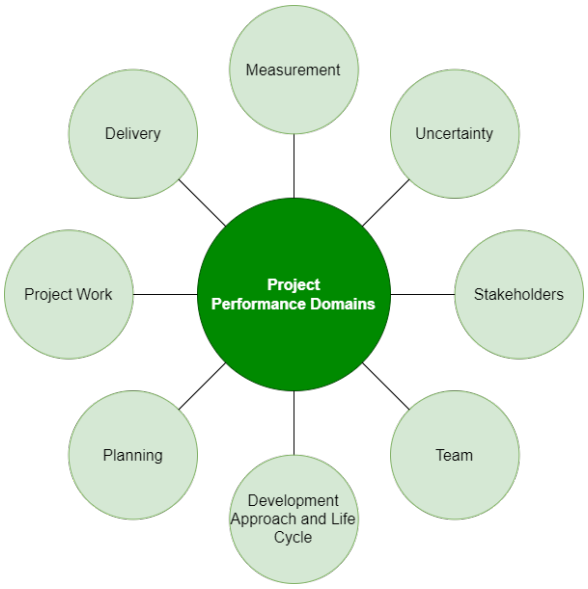

Figure 1. PMBOK 7th Edition Performance Domain

B. Research Method

This systematic literature review followed the guidelines that have been proposed by Kitchenham's protocol to answer research questions [12]. Systematic Literature Review (SLR) is a methodological way to identify, evaluate, and interpret previous studies based on a topic to answer the research questions. Kitchenham's protocol is structured as three main stages for a systematic literature review shown in Figure 2 below:

- Planning systematic review, including defining the purpose of systematic literature reviews and developing systematic literature review protocol.

- Conducting systematic review, including performing search and literature selection; identifying included articles; and extracting and synthesizing data.
- Reporting systematic review, including classifying articles into related demographics, identifying innovation aspects; describing detail innovation; identifying innovation benefit; mapping benefit to performance domain; and performing analysis and conclusion.

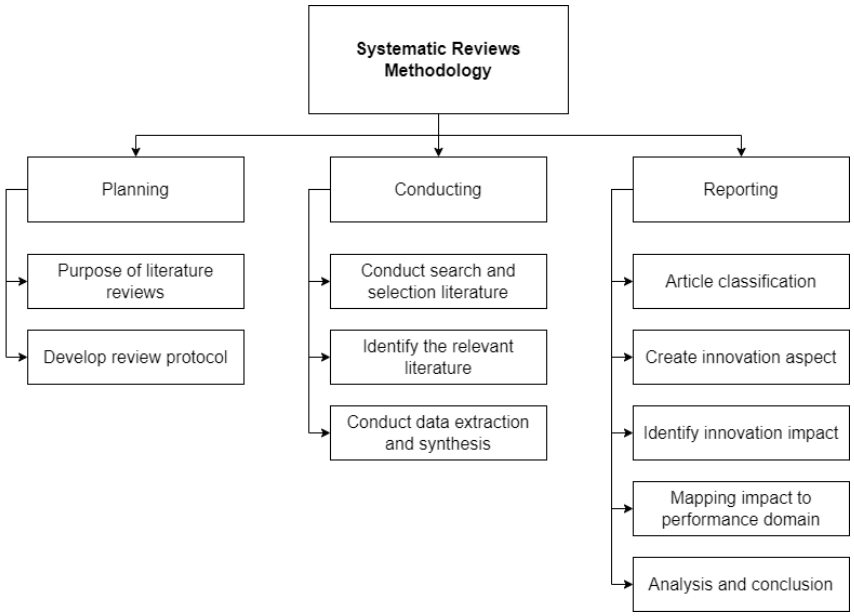

Figure 2. Systematic Literature Review Methodology

Planning Systematic Review

This study follows a systematic search to collect relevant literature that was published between 2018 and 2023 using Kitchenham's guidelines. The initial step in planning is selecting a database to perform the keyword-based search. This study uses six major digital libraries shown below:

- ACM Digital Library
- EBSCOhost
- IEEE Xplore
- Sage Journals
- ScienceDirect
- Semantic Scholar

Then, formulate a search query to find relevant literature by providing a specific query. This study uses a query that focuses on APM innovation or tailoring. The search query applies to both the meta-data and full text (when available) from the publications. The keywords for initial searching are as follows **"agile project management" AND (innovation OR tailor* OR improve*)**.

To improve the quality of the systematic literature review, this study uses inclusion and exclusion criteria. This inclusion criteria can filter included literature based on IN1, IN2, IN3, IN4, and IN5. While, exclusion criteria are used to decide what articles that not included in the systematic review based on EX1, EX2, EX3,

EX4, and EX5. These inclusion and exclusion criteria facilitate faster and better article selection. Table 1 presents the inclusion and exclusion criteria used in this study.

Table 1. Inclusion and Exclusion Criteria

Rules	Criteria	ID
Inclusion	1) Full-text articles available	IN1
	2) Written in the English language	IN2
	3) Published between 2019 and 2023	IN3
	4) Journal or conference proceeding articles published in the selected database	IN4
	5) Focus on APM innovation or tailoring	IN5
Exclusion	1) Full-text articles not available	EX1
	2) Not written in the English language	EX2
	3) Published outside of time frame	EX3
	4) Articles are secondary or tertiary studies (e.g., systematic reviews, surveys, etc.), books, or reports	EX4
	5) Discuss about APM in general (not related to innovation or tailoring)	EX5

Conducting Systematic Review

This process begins with article selection from six selected databases using custom queries and keywords. All databases can perform article searching, except ScienceDirect because the database can't use wildcards sign (*) to perform a search. Then, especially for ScienceDirect, the query follows **"agile project management" AND (innovation OR tailoring OR improvement)**.

Figure 3 shows all phases of conducting article selection. The results of every article search are documented by bibliography management software called Zotero. The result is exported into BibTex or RIS format that can be read by software. Then, the initial search based on the query generates 2,543 articles. This result also has removed duplicate articles. The next phase is screening articles by title and abstract. This phase gave 74 articles selected and 2,469 other articles were excluded. Then, the selected articles will follow the next phase, which finds articles in full text. From this, 69 articles can be found in its full text and 5 others not.

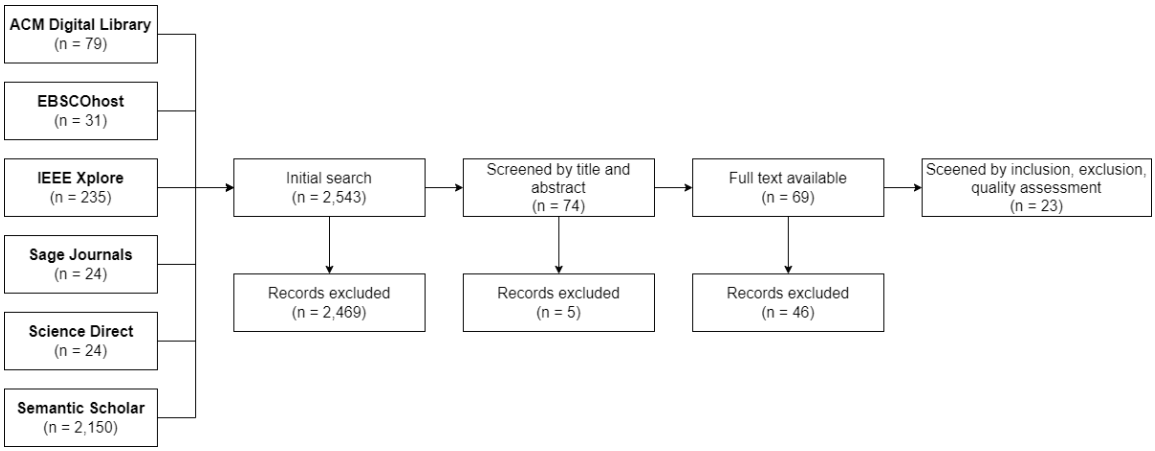

Figure 3. Literature Selection Process

After the article's full text is available, the next phase read it to perform a deeper screening process. In this phase, selected articles were screened by inclusion and exclusion criteria. If the selection was unclear, then a quality assessment was conducted. There were 11 quality assessment criterias based on SA1, SA2, SA3, SA4, SA5, SA6, SA7, SA8, SA9, SA10, and SA11 [13]. These quality assessments had two options answer ("yes" or "no"). Screening criteria were performed for quality assessment based on literature context and objective. The criteria based on screening were SA1, SA2, and SA3. If the literature passes three criteria, then quality assessment is next to the other criteria. The other criteria are concerned with three main quality problems while performing a systematic literature review.

- Rigour, there were 5 criteria related to ensuring the validity of the research methodology, including data collection and data analysis. The criterias based on rigour were SA4, SA5, SA6, SA7, and SA8.
- Credibility, there were 2 criteria related to ensuring validity and meaningful study findings. The criteria based on credibility were SA9 and SA10.
- Relevance, there were criteria related to implication study for research and industry. The criteria based on relevance was SA11.

Table 2 presented details of quality assessment criteria for this systematic literature review and their association with the literature. 23 articles were included for review after comprehensive articles selection. Details of included articles for a systematic literature review can be seen in the Reporting Systematic Review section. The quality assessment criteria could extend the confidence of study findings to make a valuable contribution. Then, the included articles would perform data extraction and synthesis.

Table 2. Quality Assessment Criteria

ID	Criteria	Association
SA1	Does the paper rely on empirical research, or is it solely a report of insights gained from expert perspectives?	Screening
SA2	Does the research contain a well-defined statement of its objectives?	Screening
SA3	Does the research provide a good depiction of the circumstances in which it was conducted?	Screening
SA4	Was the chosen research methodology suitable for achieving the research objectives?	Research Design
SA5	Was the recruitment methodology aligned with the research objectives?	Sampling
SA6	Was a control group included in the study design to enable a comparison of treatments?	Control Group
SA7	Was the methodology employed for data collection adequate in addressing the research problem?	Collection of data
SA8	Did the data analysis meet the required level of rigor?	Analysis of data
SA9	Has the level of consideration given to the relationship between the researcher and participants been sufficient?	Reflexivity
SA10	Does the research report present a concise and unambiguous declaration of its discoveries?	Findings
SA11	Is investigating this subject matter beneficial for academic inquiry or practical application?	Implications

The 23 selected articles were extracted into tables that contained many items. The extraction process was a phase to load all details of literature that could be useful for answering research questions and finding meaningful insight. There were 14 items to extract from each of the articles. Items of extraction related to specific goals that want to explore from literature. The general category used to identify common information from the research, including a paper identifier, date of extraction, bibliographic reference, research objective, data collection, and analysis method. The demographic category was used to explore new insight from literature, including publication year distribution, type of paper, source database, and study design. The RQ1 column is used to answer the research question about innovation aspects and the RQ2 column is used to answer the research question about the benefit of innovation and its performance domain. Table 3 shows the details of the data extraction format for this study.

Table 3. Data Extraction Format

Item	Description	Relation
Paper Identifier	A different alphanumeric code assigned to a research project	General
Date	The date on which the data was extracted	General
Bibliographic reference	Include the author's name, year of publication, title of the work, and source from which it was obtained	General
Year	Year of article publication	Demographic
Type of paper	Written works are classified into distinct categories: journal articles or conference papers	Demographic
Database	Article database source: ACM Digital Library, EBSCOhost, IEEE Xplore, Sage Journals, or ScienceDirect	Demographic
Objectives	Goals or aims of the research	General
Study's design	Qualitative or quantitative study, with potential subtypes including experiment, survey, case study, or action research	Demographic
Data collection	The approach utilized to acquire the data. Standard methods of data collection in research include the use of questionnaires, interviews, or forms	General
Data analysis	The approach employed to analyze the data	General
Aspect	The aspect of APM innovation or tailoring based on PMBOK 7th Edition, including processes, tools, engagement, artifacts, and methods, or the selection of life cycle and development approach	RQ1
Innovation	Detail of innovation	RQ1
Benefit	The benefit of APM innovation or tailoring for a project or organization	RQ2
Performance Domain	Mapping of benefits based on PMBOK 7th Edition performance domain, namely team, planning, delivery, uncertainty, stakeholders, development approach and life cycle, project work, and measurement	RQ2

Thematic analysis was used to analyze and synthesize the selected articles that had been extracted [14]. This analysis would map extracted data into related themes. First, the detail of innovations was mapped into the innovation aspect from PMBOK 7th Edition. This synthesized process to answer RQ1. Then, the

benefits of innovation were mapped into the PMBOK 7th Edition performance domain. This analysis is used to answer RQ2.

Reporting Systematic Review

The last stage of systematic literature review that has been proposed by Kitchenham was reporting the review. The result of every stage is documented and reported in the study to be informed comprehensively and transparently. From query for search, source databases, inclusion and exclusion criteria, article selection phase, data extraction, and data synthesis. Table 4 shows general information about the included articles.

Table 4. Included Articles

ID	Reference	Year	Type of Paper	Database
APM1	[15]	2021	Conference paper	Semantic Scholar
APM2	[16]	2019	Journal article	Semantic Scholar
APM3	[17]	2022	Journal article	EBSCOhost
APM4	[18]	2022	Journal article	EBSCOhost
APM5	[19]	2019	Journal article	Semantic Scholar
APM6	[20]	2023	Journal article	Sage Journals
APM7	[21]	2022	Conference paper	IEEE Xplore
APM8	[22]	2022	Journal article	IEEE Xplore
APM9	[23]	2021	Journal article	ScienceDirect
APM10	[24]	2021	Journal article	Semantic Scholar
APM11	[25]	2022	Conference paper	IEEE Xplore
APM12	[26]	2019	Journal article	ScienceDirect
APM13	[27]	2019	Journal article	Semantic Scholar
APM14	[28]	2023	Journal article	Sage Journals
APM15	[29]	2021	Journal article	Semantic Scholar
APM16	[30]	2022	Journal article	Semantic Scholar
APM17	[31]	2023	Journal article	Semantic Scholar
APM18	[32]	2021	Conference paper	IEEE Xplore
APM19	[5]	2021	Conference paper	IEEE Xplore
APM20	[33]	2019	Journal article	Semantic Scholar
APM21	[34]	2021	Journal article	ScienceDirect
APM22	[35]	2019	Journal article	EBSCOhost
APM23	[36]	2020	Journal article	Semantic Scholar

C. Result and Discussion

This section presented the result of this study, including article demography and the findings to answer research questions. In the article's demography, there were three outputs, namely publication year distribution, type of paper, and study design. Then, the findings delivered innovation aspect and benefit by performance domain based on PMBOK 7th Edition.

Articles Demography

This part presented general information about this research. This information is useful for delivering common information from selected literature in the systematic literature review. This demography could represent popularity research in APM, especially about innovation or tailoring.

1. Publication Year Distribution

From 23 articles, most of the articles came from research in 2021. There were six articles published in 2021. In 2020, research about APM was reduced, so it gave only one article selected. Besides, from this demography, there was a fact that every year, at least one piece of research about APM was published in journal articles or conference papers. This result became a motivation for researchers who are passionate about APM to publish their study because research about APM is still popular and exists in the community. Figure 4 below shows the distribution of publications by year.

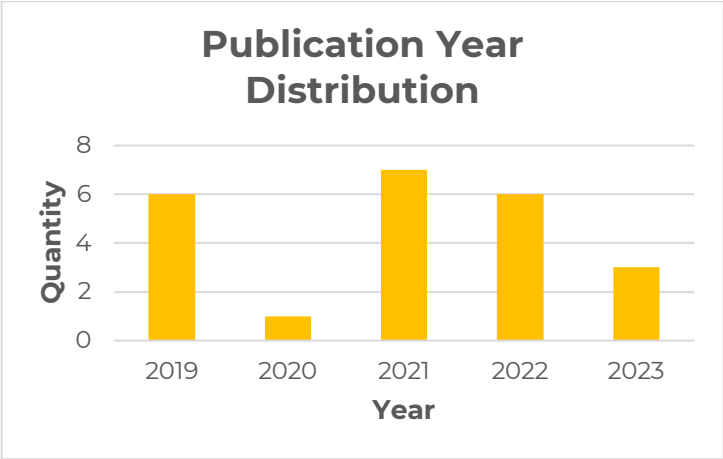

Figure 4. Publication Year Distribution

2. Type of Paper

In this study, there were two types of papers identified, namely conference papers and journal articles. Most of the paper came from journal articles, which had 18 articles contributed to this study. The conference paper had a total of 5 articles had been reviewed. From this demography, there was a fact that most articles published in journals, especially in source databases used for article selection in this review. This result could be a consideration for researchers to publish their research about APM innovation or tailoring. Figure 5 below presents the distribution of paper type in this systematic review.

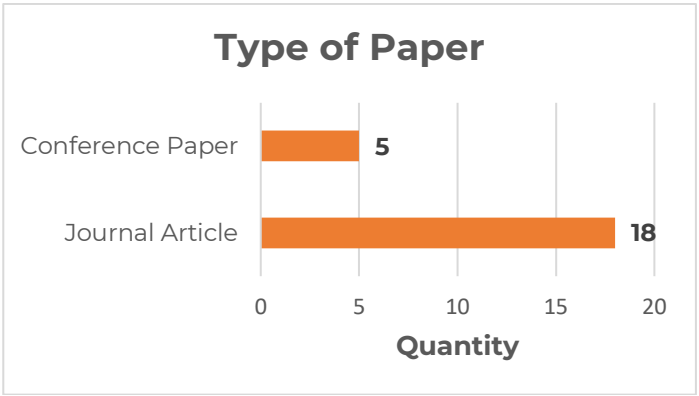

Figure 5. Type of Paper

3. Study's Design

The meaning of the study's design in this review was the methodology that is used by the literature. In research, three types of methodology could be used to perform the research, namely qualitative, quantitative, and mixed-method. From this review, most of the study used quantitative methods. There were 48% or 11 articles. A qualitative study has 17% or 8 articles included. Then, the rest of the articles used a mixed method, which was 4 articles selected. In quantitative studies, most data collection used questionnaires, and data was analyzed using descriptive statistics and the Structural Equation Model (SEM). Figure 6 below shows the distribution of research methodology used by previous literature.

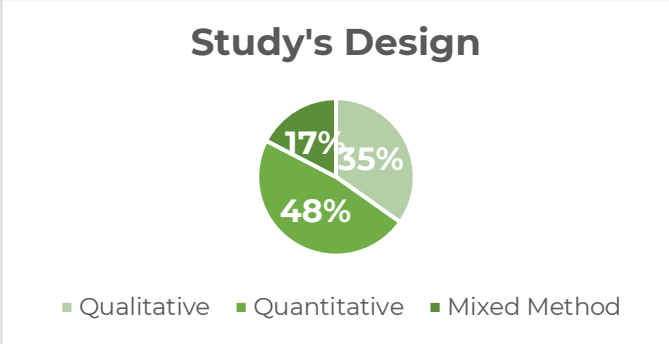

Figure 6. Study's Design

Results

This result presented findings from a systematic literature review that has been conducted. These findings also explained and described the answers to research questions expressed in the Introduction section. This result came from thematic analysis from data extraction before.

1. Innovation Aspects

RQ1. *What aspects of the APM innovation were carried out in previous studies related to the PMBOK 7th Edition?*

To answer RQ1, first, this study identified the innovation or tailoring aspects that are covered by PMBOK 7th Edition. There were five aspects included, namely life cycle and development approach selection (ASP1); processes (ASP2), engagement (ASP3); tools (ASP4); and methods and artifacts (ASP5) [10]. These aspects became the main themes to identify innovation that has been done by organizations.

Second, this study extracted the innovation from selected articles. Every previous study has at least one innovation developed. The innovation of each study could be the same as with the others, or not. The last step was mapping the innovation into related innovation aspects. Each of them is grouped into innovation aspects. Each innovation is only mapped into one innovation aspect.

From ASP1, there were six innovations have developed. There was an innovation that was used by more than one study, namely Building Information Modelling (BIM) technology. Many organizations integrated APM and BIM to

increase project effectiveness and productivity. The innovation used by APM1 and APM16. The other study that categorized in ASP1 were APM5, APM9, APM17, APM19, and APM 23. Each of them only developed one innovation for this aspect. Almost all of them integrated the APM life cycle and the other approach to benefit from innovation.

In ASP2, there were five innovations used by previous studies. There was no innovation developed by more than one study, so each study developed one innovation. The innovations that contributed to this aspect were APM3, APM4, APM15, and APM22. Most of them added a process to increase project performance and benefit from its innovation.

At ASP3, there were six innovations identified from the review. Most of them created an approach for users, stakeholders, or teams to increase communication, coordination, and project participation. The innovation from this aspect has been done by APM4, APM6, APM8, APM10, APM12, and APM14.

In ASP4, there were only two innovations identified. The fuzzy expert system was an interesting tool to increase the accuracy of project estimation. This innovation was developed by APM11. The other innovation introduced by APM18 produced an interactive game called ScrumTale to help the team understand about Scrum approach. These tools facilitated the project team to manage a project efficiently.

Last, at ASP5, six innovations have been done by primary literature. The innovations focused on improving their project performance by developing a method that is useful for the team. The method could be a strategy, training, improvement, or an approach. The innovations for this aspect were developed by APM2, APM4, APM7, APM13, APM20, and APM21.

From all aspects, the innovation contributed to the project directly and indirectly. Every aspect needs to be innovative or tailored to improve project performance. Table 5 below shows the mapping of tailoring aspects and the innovation that is developed by organizations. Next, this study identified the benefits of innovations based on the PMBOK 7th Edition performance domain.

Table 5. Innovation Related to PMBOK 7th Edition Tailoring Aspects

ID	Aspect	Innovation	References
ASP1	Life cycle and development approach selection	1) Combine with standard project management approach (APM23)	[36]
		2) Improve development process (APM5)	[19]
		3) Building Information Modelling (BIM) technology (APM1, APM16)	[15], [30]
		4) Complex Technical Planning Project (CTPP) (APM9)	[23]
		5) Agile development environment (APM19)	[5]
		6) Integrating Lean-Agile Project Management Office (LAPMO) (APM17)	[31]
ASP2	Processes	1) Goal-driven approach to manage risk (APM22)	[35]
		2) Integrating Agile innovation steps in everyday processes (APM15)	[29]
		3) Outsourcing agile project delivery (APM3)	[17]
		4) Regularly conduct progress monitoring and evaluation (APM4)	[18]

ID	Aspect	Innovation	References
		5) Flexible workflow (APM4)	[18]
ASP3	Engagement	1) Participation strategies (APM12)	[26]
		2) Develop a culture for employee psychological empowerment (APM6)	[20]
		3) Teamwork quality (APM8)	[22]
		4) Shared leadership (APM14)	[28]
		5) User participation (APM4)	[18]
		6) Enhance stakeholder awareness (APM10)	[24]
ASP4	Tools	1) Estimating story points using a fuzzy expert system (APM11)	[25]
		2) ScrumTale learning game (APM18)	[32]
ASP5	Methods and artifacts	1) Strategic planning (APM13)	[27]
		2) Intercultural English language training (APM7)	[21]
		3) Innovative working behavior (APM2)	[16]
		4) Transformation and collaboration strategy (APM21)	[34]
		5) Continuous improvement (APM4)	[18]
		6) Team and individual-centered approach (APM20)	[33]

2. Benefits

RQ2. *What are the benefits of the APM innovation that have been made related to the PMBOK 7th Edition performance domain?*

These findings answered RQ2 for systematic review. Three steps have been taken for this part. First, this study identified all of PMBOK 7th Edition performance domains. There were eight performance domains, namely stakeholders (PD1); team (PD3); development approach and life cycle (PD3); planning (PD4); project work (PD5); delivery (PD6); measurement (PD7); and uncertainty (PD8) [10]. These performance domains became the main focus to map the benefits that got from innovations.

Then, this research listed all the benefits of APM innovations. Each study could have one or more benefits because the benefits depend on what organization's objectives to perform an innovation. Last, this study had been mapping each benefit into related performance domains.

Starting from PD1, there were three benefits identified. Most of the benefit came from stakeholders' satisfaction, which was presented by APM2 and APM23. The other benefit came from APM 15 and APM18 that related to benefits for customers.

In PD2, there were six benefits announced. The most benefit came from improved team communication in APM5 and APM7, as well as increased team performance in APM14 and APM16. The other benefit came from studies in APM9, APM13, APM18, and APM20.

At PD3, there was only one benefit identified. It increased APM experience by APM18. The other performance domain that has one benefit is PD8. The benefit was resolved uncertainty in requirement management that was described by APM11.

In PD4, there were four benefits described. The most benefit came from reduced expenses by APM5 and APM19. The other benefit also mentioned by APM1, APM8, and APM11.

In PD5, there were also four benefits like before, that was PD4. Each benefit came from a study, so there was no dominant benefit in this performance domain. The benefits came from APM5, APM12, and APM22.

In PD6, there were still the same as before, four benefits were identified. The dominant benefits came from an increased delivery time in APM5 and APM19. The other benefit produced from APM3, APM8, and APM17.

Finally, PD7 had the most benefits among other performance domains. There were nine benefits related to measuring project variables or success. Most of them gave points on project efficiency which were mentioned by APM2, APM4, APM10, APM14, and APM23. The other benefit came from APM2, APM5, APM6, APM9, APM16, APM17, APM19, and APM21.

This result presented that every innovation that was developed by organizations brought benefits into related areas, such as these performance domains. Benefits gave advantages to organizations to improve their innovation or tailoring that gave impact on project success. Table 6 below presents the mapping of benefits to performance domains.

Table 6. Benefits Related to PMBOK 7th Edition Performance Domain

ID	Performance Domain	Benefit	References
PD1	Stakeholders	1) Stakeholders satisfaction (APM2, APM23)	[16], [36]
		2) Customer collaboration (APM18)	[32]
		3) Increase customer-centered process (APM15)	[29]
PD2	Team	1) Increase team communication and coordination (APM13)	[27]
		2) Improve team communication (APM5, APM7)	[19], [21]
		3) Improve motivation and engagement (APM18)	[32]
		4) Team performance (APM14, APM16)	[28], [30]
		5) Improve project manager and team alignment (APM9)	[23]
		6) Clear team role and responsibility (APM20)	[33]
PD3	Development approach and life cycle	1) Increase APM experience (APM18)	[32]
PD4	Planning	1) Fulfill project goals (APM8)	[22]
		2) Improve effort estimation (APM11)	[25]
		3) Reduce expenses (APM5, APM19)	[5], [19]
		4) Improve planning by time, cost, and quality (APM1)	[15]
PD5	Project work	1) Reducing the risk of time, cost, and quality based on project goal (APM22)	[35]
		2) Improve managing tasks (APM12)	[26]
		3) Reduce bugs (APM5)	[19]
		4) Improve risk analysis (APM5)	[19]
PD6	Delivery	1) Teams deliver prototypes to users regularly (APM8)	[22]
		2) Contribute to project success (APM3)	[17]
		3) Increase deliver time (APM5, APM19)	[5], [19]
		4) Increase time to market (APM17)	[31]
PD7	Measurement	1) Improve organizational long-term	[20], [31]

ID	Performance Domain		Benefit	References
			performance (APM6, APM17)	
		2)	Project efficiency (APM2, APM4, APM10, APM14, APM23)	[16], [18], [24], [28], [36]
		3)	Meets project output perception (APM2)	[16]
		4)	Increase competitive value (APM21)	[34]
		5)	Increase project quality (APM5)	[19]
		6)	Improve project performance (APM9, APM16)	[23], [30]
		7)	Project agility (APM17)	[31]
		8)	Increase productivity (APM19)	[5]
		9)	Increase sales and growth (APM19)	[5]
PD8	Uncertainty	1)	Resolve uncertainty (APM11)	[25]

D. Conclusion

APM in many years improved significantly among different industries. Many reasons of organizations prefer to adopt APM for their projects. Then, APM has proven that could give benefits and advantages for those who had implemented the methodology. Among organizations that adopted APM, many of them improved the methodology through innovation and tailoring. Agile could enable innovation, then innovation increased organizational agility. Innovation could be categorized into four aspects, namely life cycle and development approach selection; processes; engagement; tools; methods, and artifacts.

This study was a systematic literature review based on the Kitchenham protocol. There were three steps, planning a systematic review, conducting a systematic review, and last report a systematic review. In article selection from six source databases (ACM Digital Library, EBSCOhost, IEEE Xplore, Sage Journals, ScienceDirect, and Semantic Scholar), there were 23 articles selected to review. These articles could be journal articles or conference papers.

The findings of this study presented that each of the previous studies could be mapped into every aspect of innovation based on PMBOK 7th Edition. Then, the results of the review showed that each innovation contributed to the PMBOK 7th Edition performance domain. Finally, this study gave a representation that innovation developed by the organization to achieve its objectives also brought benefits to its organization.

Implications

This study as a systematic literature review contributes to the research community and industry as well. For the research community, this study gives a new systematic review of APM, especially focused on innovation and tailoring. This study has a comprehensive and transparent review to explain innovation aspects and its benefits from the PMBOK 7th Edition performance domain perspective. This research also contributes to increasing research in APM commonly. If there is a researcher who wants to study empirically in APM innovation and tailoring, this paper can be one of the references. For industry, this study becomes a reference for them to implement, improve, innovate, or tailor APM from every aspect. Innovation in this paper can be an inspiration to implement for their organization.

Future Works

This study has limitations in the number of databases and year. It has an impact on the number of selected studies to review. In the next research, the number of source databases can be added and give different perspectives to analyze data. It can add the challenge of innovating or tailoring some aspects of APM. So, there will be clarity about the drawbacks of innovation and tailoring too.

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