

Disruptive impact of sustainability in project management and Emerging sustainable practices in PMBOK 7th edition

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Abstract

Following concerns about exponential growth of world population, pollution, resource scarcity and its consequences sustainable development has become an urgent need that requires institutional and governmental action. It is obvious that our unsustainable present has been built through projects by neglecting wider issues and Grand Challenges. Sustainability in project management has always been easy to understand but hard to implement in practice due to potential difficulties and lack of implicative solutions in PM standards. This paper explores paradigmatic impacts of sustainability in project management practices and sustainability footprints in PMBOK 7th edition. In the first phase, the research follows an integrative literature review and thematically structure the review to synthesis the concepts to come up with a specific conclusion. In the second phase, researches will conduct interviews to strengthen the initial findings and generate new ideas about sustainable project practices. The study considers sustainability in project management as a crucial but disruptive aspect to be incorporated into the traditional management functions. It proposes sustainability as a key factor which evolves current project management practices in a shift from process-based to a principle-based while creating value instead of focusing on deliverables and outputs.

Keywords: Sustainable project practices, Project management standards, paradigm shifts, disruptive sustainability

1 Introduction

Organizations are now facing intense scrutiny regarding their economic, environmental, and social impacts due to concerns about various grand challenges. This scrutiny extends to project organizing arrangements (Sabini and Silvius 2023). It's clear that our current unsustainable state has been created through the execution of projects, programs, and portfolios that neglected wider issues and Grand Challenges. Therefore, the next challenge for the project management profession is to leverage the principles of project, program, and portfolio management (P3M) to build a better world, as highlighted by (Zerjav and Konstantinou 2021).

Sustainable development, as defined by the Brundtland Commission's Report, is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations, 1987). Sustainable development has 3 pillars known as 'Triple-P (People, Planet, and Profit) or (social, environment and economic) (Elkington 1997). Projects play a pivotal role in the realization of more sustainable business practices, and the concept of sustainability has more recently also been linked to project management. Organizations nowadays are increasingly keen on to include sustainability in their business. Project management can help make this process a success but little guidance and practical solutions are available on how to apply sustainability to projects (Marcelino-Sádaba, González-Jaen et al. 2015). On the other hand, A structured review of 164 publications, covering the time period 1993 – 2013 by (Silvius and Schipper 2014), indicates that the standards for project management fail to seriously address the sustainability agenda.

The impact of sustainability on project management processes and practices varies across different levels. The reason for this is that integrating project management and sustainability is not a straightforward process noted by (Sabini, Muzio et al. 2019). According to (Silvius and Schipper 2014), incorporating sustainability requires a shift in project management from managing time, budget, and quality to managing social, environmental, and economic impacts. This shift is complicated by the different time horizons of these activities, as pointed out by (Moehler, Hope et al. 2018). Project management is focused on achieving precise objectives and completing time-bound activities, while sustainability is concerned with long-term challenges that often lack clear solutions. Embedding sustainable objectives in project management, including the social, environmental, and economic dimensions, requires a paradigm shift in PM practices and exploration of its undefined long-term effects. This also involves engaging a larger audience of stakeholders, resulting in increased complexity and conflicting interests in project management, as (Sabini and Silvius 2023) highlight.

On the other hand, little guidance and practical solutions are available on how to apply sustainability to projects. According to 2022 PMI call for papers, Sustainability can be seen in 2 ways in projects. First, sustainability 'by' the projects which considers projects as catalysts of sustainability transitions to pursue SDG targets. The second approach is (sustainability 'of' the projects), focusing on the consideration of sustainability within project management processes by utilizing more sustainable ways of delivering the projects regardless of the product or service delivered. Understanding the concept of second approach can be investigated by studying PM standards which is the focus of this research considering standards as a foundation for common best practices in project management. A structured review of 164 publications by (Silvius and Schipper 2014) covering the time period 1993 – 2013 indicates that the standards for project management fail to seriously address the sustainability agenda. In addition, a brief review of PM standards by (Økland 2015) indicates

that there is a wide gap between the models, tools and frameworks presented in academic literature and common practice as expressed by project management standards.

To summarize, sustainability in project management is easy to understand but complex in practice (Boswell, Wallace et al. 2005) which disrupts the traditional way of managing projects not only in practices but also in mindsets. That's why PM standards are trying to grapple with this issue to embed it in project management practices (Silvius and Schipper 2014).

2 Research aim and objectives

This paper aims to provide an overview of the published research on paradigm shifts in PM practices in the light of sustainability and how they have been addressed in Project Management Body of Knowledge (PMBOK, 7th Edition).

3 Contribution to knowledge and practice

- Enhancing knowledge about sustainable project management through identifying sustainable practices leading to “sustainability of the projects”.
- Providing practical solutions for project, program and portfolio managers and organizations to embed sustainability in their practices.
- Bridging possible gaps between what is introduced in academic literature and what is presented in PMBOK in terms of sustainability.
- Providing insights for learning, developing practical solutions and initiatives.
- Generating new ideas and concepts in sustainable project management through interviews.
- Contributing to sustainable society and planet through project management practices in wider perspective.

4 Method

An integrative literature review in combination with interviews will be carried out to meet research objectives. According to (Torraco 2016) integrative literature review is a distinctive form of research. It reviews, critiques, and synthesizes Representative literature on a topic in an integrated way such that new frameworks and Perspectives on the topic are generated. Integrative literature reviews are conducted on dynamic topics that experience rapid growth in the literature, and that have not benefited from a comprehensive review and update during an extended period. They are also used to review new emerging topics that generate a growing body of literature that may include contradictions or a discrepancy between the literature and observations about the issue, which are not addressed in the literature. Conditions for sustainable development are difficult to achieve and even more difficult to demonstrate (Boswell, Wallace et al. 2005) and sustainability is a complex term to define in a practical way (Pope, Annandale et al. 2004, Glavič and Lukman 2007). Therefore, an integrative literature review was applied as the most appropriate research method to meet research aim and objectives which will be followed by interviews to strengthen the initial findings by incorporating empirical evidence.

The search for literature began by listing relevant keywords such as “sustainability in project management,” “sustainable project practices,” in Scopus. To ensure a sufficiently thorough coverage of our research field, publications, books, Journal articles and industry and professional associations’ reports in the last 23 years (since 2000) after excluding non-English articles and not relevant or less relevant articles with a focus on “practical solutions” 20 articles were selected to review.

According to (Cooper 1988), literature reviews can be organized in three ways: (a) conceptually, (b) historically, (c) methodologically. The existing study was structured conceptually or thematically to ensure the same ideas are reviewed together. Conceptual or thematic structuring of the topic provides the literature review with coherence and clarity about what is being reviewed and how the main concepts or themes of the topic come together as a unified idea (Torraco 2016).

The research design follows 4 stages through utilizing qualitative data. After the initial search about sustainability in project management and thematically structuring the findings, the researchers started with predefined themes extracted from previous studies, to explore the footprints of sustainability in PMBOK 7th edition. The researchers assigned those themes to the new qualitative data from PMBOK to come up with a specific conclusion. In the fourth stage findings from literature will be followed by interviews.

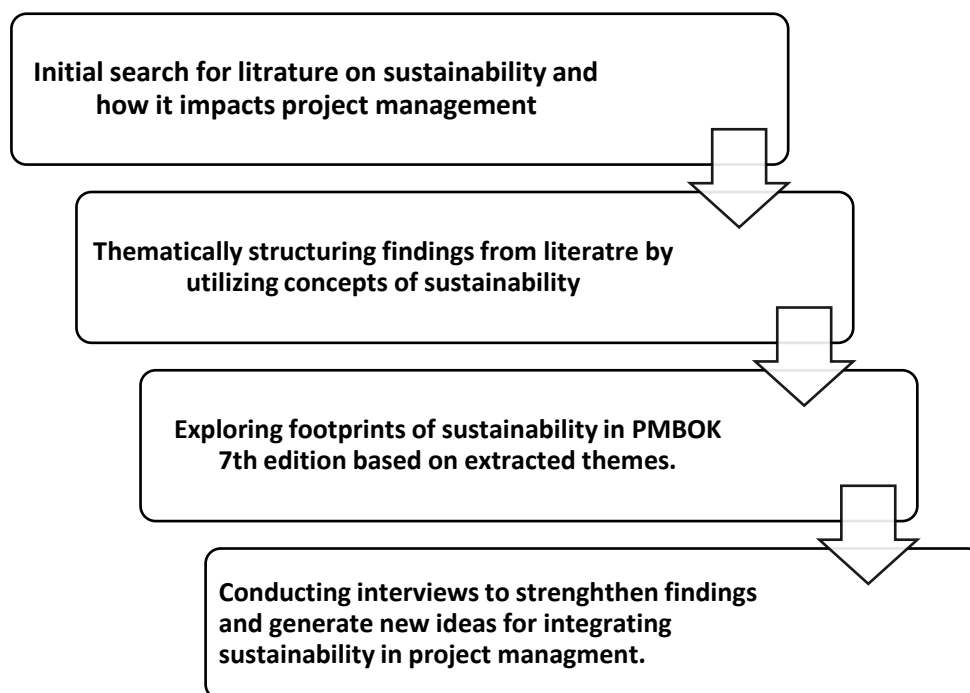


Figure 1: Research design in 4 stages.

5 Limitations:

This study doesn't quantify the shifts we need in project management to have a sense about amount of effort we need to transform the field in response to sustainability issues and challenges.

6 Initial findings

6.1 Sustainable development

The term 'sustainable development' emerged from a response by activists and political leaders to the exponential increase in resource consumption due to industrialization. The discussion on a global scale was triggered by the publication of the book Limits to Growth by the Club

of Rome in 1972 (Meadows, Meadows et al. 1972). If the world population continues to grow at these rates, future generations will have to endure an overpopulated world with a destroyed environment. These concerns led to the establishment of the United Nations' (UN) 'World Commission on Development and Environment,' also known as the Brundtland Commission. In 1987, the Brundtland Commission published the report 'Our Common Future,' outlining the principles of sustainable development (Brundtland 1987). The UN General Assembly's acceptance of the Brundtland Report put sustainable development on the agenda of many governments (Silvius, SchIPPER et al. 2012)

Sustainability is one of the most important challenges of our time. "How can we develop prosperity, without compromising the life of future generations?"(Silvius and Schipper 2014) Sustainable development, as defined by the Brundtland Commission's Report (Borowy 2013), is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations, 1987). Sustainable development has 3 pillars known as 'Triple-P (People, Planet, and Profit) or (social, environment and economic) (Elkington 1997).

Sustainable development is not only a concern for governments, as businesses and consumers are also becoming increasingly aware that our current patterns of production and consumption are not sustainable. The public is becoming more conscious of the problem due to alarming signs such as significant oil spills, natural disasters, climate change, and health issues related to the environment. While governmental regulations are crucial for achieving a change in the status quo, the impetus for change can and should come from businesses and projects (Silvius, SchIPPER et al. 2012).

6.2 Sustainability in project management and Principals of sustainability

Sustainability can be defined in different contexts. In projects, programs and portfolios, sustainability remains significant and important. At the 15th IPMA World Congress on Project Management in 2000, (Gorrino-Arriaga and ERASO 1999) conducted a literature review and concluded that project managers must grasp the business context of their projects, and proposed new competencies and procedures to address this need. (Hartman 2000) supports this idea, stating that business competitiveness necessitates constant change and that the static nature of organizational models severely limits their capacity to achieve change. Project management is now the preferred method for implementing technological and other changes, but according to Hartman, the next step for project management is to meet the future needs of organizations. According to APM body of knowledge 7th edition sustainable project management is a fundamental competence vital for improving and facilitating effective project management. PMI standard 7th edition considers projects as agents of change to make a transition from current state to a future desirable state. So, sustainable project management is a necessity to create value for the environment, society, and economy. An investigation of sustainability principals by (Silvius, Kampinga et al. 2017) summarizes sustainability principals in the context of the projects.

6.2.1 Sustainability is about balancing or harmonizing social, environmental, and economic interests

Achieving sustainability requires balancing and harmonizing these pillars, which may involve making tradeoffs, and going beyond the traditional iron triangle of time, budget, and quality. (Silvius, SchIPPER et al. 2012) explains how these dimensions are interconnected and influence each other in various ways. However, some studies have attempted to

operationalize the Triple Bottom Line concept by creating sets of indicators for each dimension, which may overlook the importance of holistically integrating the three pillars (Bell and Morse 2003); (Fernández-Sánchez and Rodríguez-López 2010); (Keeble, Topiol et al. 2003); (Brent and Labuschagne 2006); (Martens and Carvalho 2016).

6.2.2 Sustainability is about both short-term and long-term orientation

The 7th edition of the PMI standard defines a project as a temporary endeavour undertaken to create a unique product, service, or result. This definition suggests that the project itself will have limited economic, environmental, and social consequences, and that it is the project's deliverables that will have these impacts. As projects are temporary organizations, they are naturally oriented towards the short-term. However, (Brent and Labuschagne 2006) argue that sustainability considerations require a broader perspective that includes the life cycles of both the project and its deliverables, as well as the products produced by those deliverables. (Silvius and Schipper 2014) define the scope of sustainable project management as encompassing a project's resources, processes, deliverables, and effects, and visualize this expanded scope as a timeline that extends from the project life cycle to future generations.

6.2.3 Sustainability is about local and global orientation

many organizations have international stakeholders, including competitors, suppliers, and potential customers, who may influence or be influenced by their actions (Silvius and Schipper 2014). In the context of projects, globalization encompasses the supply chain of materials and resources, geographically dispersed project sites and teams, and the value chain of deliverables, use, benefits, and effects (Cleland and Gareis 2006). As a result, considering sustainability in project management requires examining multiple levels, including the global, regional, and local (Gareis, Huemann et al. 2011).

6.2.4 Sustainability is about values and ethics

Several studies, including (Schieg 2009), (Allerberger, Gareis et al. 2009, Gareis, Huemann et al. 2013), and (Eskerod and Huemann 2013), have addressed the values dimension of considering sustainability in project management. Sustainable development is inherently a normative concept (Gereis, Huemann et al. 2009) that reflects society's values and ethical considerations (Goedknecht and Silvius 2012). This issue is reflected in the Codes of Ethics and Professional Conduct issued by the Project Management Institute (2010) and the International Project Management Association (2015) in recent years. The Project Management Institute code (2010) explicitly states that "The values that the global project management community defined as most important were: responsibility, respect, fairness, and honesty."

6.2.5 Sustainability is about transparency and accountability

The concept of transparency requires an organization to be transparent and accountable for its policies, decisions, and actions, including their environmental and social impacts (International Organization for Standardization, 2010). To align with this principle, integrating sustainability into project management processes and practices would involve proactive and open communication about the project, which would also encompass short-term and long-term social and environmental effects. Several studies, including (Khalfan 2006) and (Silvius, SchIPPER et al. 2012) advocate for transparency and accountability in sustainable project management.

6.2.6 Sustainability is about stakeholder participation

One of the fundamental principles of sustainability, as per the ISO 26000 guideline, is proactive engagement with stakeholders (International Standards Organization, 2010). However, stakeholder participation goes beyond merely managing and communicating with them. It is an attitude that should be integrated into all project management processes (Silvius and Schipper 2014). This approach involves engaging in a process of dialogue and consensus-building among all stakeholders as partners. Together, they define problems, design solutions, collaborate to implement them, and monitor and evaluate outcomes (Goedknecht and Silvius 2012). This principle has a logical impact on stakeholder management and communication processes in project management (Silvius and Schipper 2014). (Eskerod and Huemann 2013) also emphasize the importance of incorporating stakeholders and their interests into more project management activities to achieve sustainable development.

6.2.7 Sustainability is about risk reduction

The integration of sustainability into project management requires a shift in the way potential risks are evaluated, as noted by (Winnall 2013). In addition to conventional risk assessment, environmental and social risks must also be taken into account. To ensure a comprehensive assessment of risks, a more extended life cycle approach should be adopted, considering the project's resources, processes, deliverables, and effects, as emphasized by (Goedknecht and Silvius 2012). Moreover, a precautionary approach should be taken, as recommended by (Silvius, Kampinga et al. 2017).

6.2.8 Sustainability is about eliminating waste

Several authors have emphasized the significance of waste reduction, including (Maltzman and Shirley 2010), and (Khalfan 2006). In the context of project management, waste can also take intangible forms. Such wastage is seen in common practices, such as over-specification of requirements, changes in requirements, idle resources, waiting times, miscommunication, incomplete testing, bugs, unfit products, and so on (Maltzman and Shirley 2013).

6.2.9 Sustainability is about consuming income, not capital

According to (Silvius, Schipper et al. 2012), sustainability means preserving nature's ability to produce resources and energy. This principle extends to the social perspective, and it is essential for organizations to avoid depleting their employees' potential. In project environments, team members often face high pressure, which can increase the likelihood of burnout (Brink, 2013). Sustainable project management requires project managers to consider not only economic capital but also social and environmental capital, ensuring the organization's capacity for future production.

The following table summarizes the principals of sustainability in the context of projects according to (Silvius, Kampinga et al. 2017)

Table 1: Summary of principals of sustainability according to (Silvius, Kampinga et al. 2017)

Principles/dimensions of sustainability	Seminal sources
Sustainability is about balancing or harmonizing social, environmental and economic interests	Elkington (1997)
Sustainability is about both short-term and long-term orientation	Meadows et al. (1972), World Commission on Environment and Development (1987)
Sustainability is about both local and global orientation	Hurrell and Kingsbury (1992)
Sustainability is about values and ethics	International Organization for Standardization (2010), Gareis et al. (2013)
Sustainability is about transparency and accountability	International Organization for Standardization (2010)
Sustainability is about stakeholder orientation	Freeman (1984)
Sustainability is about reducing risks	Godfrey et al. (2009)
Sustainability is about eliminating waste	Braungart and McDonough (2002)
Sustainability is about consuming income, not capital	Dyllick and Hockerts (2002)

6.3 Sustainable project management requires paradigm shifts in project management practices

According to APM body of knowledge Sustainability in the project profession is an approach to business that balances the environmental, social, economic aspects of project-based working to meet the current needs of stakeholders without compromising or overburdening future generations.

On the other hand (Silvius and Schipper 2014), define Sustainable Project Management as the planning, monitoring and controlling of project delivery and support processes, with consideration of the environmental, economic and social aspects of life cycle of the project's resources, processes, deliverables and effects, aimed at realizing benefits for stakeholders, and performed in a transparent, fair and ethical way that includes proactive stakeholder participation.

Considering sustainability in projects requires paradigm shifts in the project management knowledge and practice. The Oxford English Dictionary defines a paradigm shift as “a fundamental change in approach or underlying assumptions.”, So, it can refer to a major change in the worldview, concepts, and practices of how something works or is accomplished. Although the notion of paradigms has been around for quite some time the concept of paradigm shifts was explored by American physicist and philosopher (Kuhn 2012) in his book “*The Structure of Scientific Revolutions*”. According to Kuhn, a paradigm shift can be described as a revolution that challenges and eventually replaces an established scientific framework. Such challenges occur when the prevailing paradigm, which typically governs accepted scientific thought, is determined to be incompatible or inadequate considering new data or discoveries. This leads to the adoption of a revised or entirely new theory or paradigm. The weight of scientific and public resistance to the new paradigm can sometimes provoke ridicule.

A paradigm shift can happen within a wide variety of contexts from scientific research to industry. A study of by (Mun, Yoon et al. 2019) investigates technological paradigm shifts through knowledge persistence over the time. The study indicates that high knowledge persistence patents are dominant or paradigmatic inventions in a specific period and so changes of top knowledge persistence patents over time can show paradigm shifts.

Having known about this concept, several studies emphasize paradigm shifts due to integrating sustainability in project management. First, a shift of scope in the management of projects: from managing time, budget, and quality, to managing social, environmental, and economic impact. Second, it implies a shift of paradigm of project management: from an approach that can be characterized by predictability and controllability, to an approach that is characterized by flexibility, complexity, and opportunity. And third, considering sustainability implies a mind shift for the project manager: from delivering requested results, to taking responsibility for sustainable development in organizations and society (Silvius and Schipper 2014). Embedding sustainable objectives in project management (social, environment and economic) needs paradigm shifts in PM practices and explore its undefined long-term effect, to include a much larger audience of stakeholders which results in increased complexity and conflicting interests in project management (Sabini and Silvius 2023).

Another shift is about project lifecycle. In order to address sustainable issues into Project Management a clear understanding of the various life cycles involved in a project and their interactions is required. (Labuschagne and Brent 2005) propose to consider the project life

cycle, the asset/process lifecycle, and the product life cycle while assessing sustainability issues in the manufacturing sector. According to (Silvius and Schipper 2014) to effectively integrate sustainability into project management, it's important to consider not only the project's life cycle, but also the life cycle of the project's outcomes, which have the potential to impact the organization's systems, assets, and behavior. Additionally, the life cycle of resources utilized during the project must be considered. The authors highlight the need to understand all three life cycles and their interrelationships to successfully integrate sustainability into project management processes. It means that sustainability requires a shift from project lifecycle to extended lifecycle for benefit realization.

An extensive, systematic literature review of 770 publications by (Sabini, Muzio et al. 2019), performed in multiple levels of analysis including micro-level (individual and professional project manager level), project level, and macro-level (entire project governance and its surrounding environment), recommends some practical mechanisms for implementing SPM in projects. However, this research illustrates that SPM field is much more complex and fragmented than when originally reviewed by (Silvius and Schipper 2014). This complexity, paradigmatic shifts, and lack of implicative practical solutions have disrupted the way PM standards are looking into the profession needs and requirements. The following section explores the latest changes and footprints of PMI standard 7th edition in the light of sustainability in project management.

7 Discussion

Emerging sustainable practices in *PMBOK® Guide by PMI– Seventh Edition*

The evolving dynamics, frameworks, and trends of project management necessitate the PMBOK to remain relevant to the profession's changing landscape. This is why the PMP certification PMBOK is updated every three to five years. The study indicates that the latest edition, PMBOK 7th Edition, features significant changes and a more comprehensive project delivery approach that can adapt to rapidly changing project requirements, including sustainability. The following changes are extracted from “summery of changes” in 7th edition and discuss how they are connected to sustainability principals.

7.1 Shifts to creating value and going beyond iron triangle

Since its inception in 1987, The Standard for Project Management has been a process-based standard. However, with the rapidly evolving nature of project management, the prescriptive nature of process-based standards may no longer effectively support good practice. In response, the PMBOK® Guide – Seventh Edition has shifted to a principles-based standard that prioritizes intended outcomes over deliverables. This represents a significant change from process-based project management to principle-based project delivery. Rather than focusing on processes, inputs, outputs, tools, and techniques, project delivery is now centered on principles and outcomes and creating values. Principle statements outline generally accepted objectives for the practice of project management and its core functions. Ultimately, the value of a project is the ultimate indicator of its success. This perspective aligns with the first principal of sustainability which goes beyond iron triangle and manages social, environmental, and economic values.

7.2 Shifts to system thinking and extended Project lifecycle

Earlier versions of the PMBOK® Guide centered around knowledge areas, whereas the Seventh Edition has shifted to performance domains. Additionally, this edition adopts a systems view of project management, starting with a focus on value delivery as part of The Standard for Project Management and permeating the PMBOK® Guide content. The systems view emphasizes the value chain that connects various business capabilities, including portfolios, programs, and projects, to further organizational strategy, value, and objectives. Instead of solely producing outputs, projects aim to enable those outputs to drive outcomes that ultimately deliver value to the organization and its stakeholders. The PMBOK® Guide no longer includes knowledge areas but is based on eight project performance domains. These performance domains are interdependent and work together to achieve desired project outcomes. As project teams continuously adapt and respond to changes within the system, they evaluate performance through outcomes-focused measures rather than adherence to processes or artifact production. This approach aligns with both the first and second principal of sustainability which enlarges the lifecycle of the project to go beyond boundaries and ensures a whole value chain of outcomes.

7.3 Shifts to flexibility in project management

The PMBOK 7th edition introduces significant changes by incorporating Tailoring, Models, Methods, and Artefacts. This new framework recognizes that a single methodology may impede a project's success based on its deliverables, organizational demands, and unique needs. Thus, project managers must select an appropriate development approach initially and then tailor it as necessary to meet all requirements. The significance of tailoring the project management approach to the unique characteristics of each project and its context is highlighted by this change. The Sixth Edition of the PMBOK Guide already included considerations to help project teams think about tailoring their approach to project management, which was included in the front matter of each Knowledge Area and provided considerations for all project environments. The Seventh Edition expands upon this work with a dedicated section on Tailoring. Additionally, a new section on Models, Methods, and Artefacts provides a high-level grouping of these resources that support project management. This section maintains linkages to previous editions' tools, techniques, and outputs that support project management without prescribing when, how, or which tools teams should use. This change can be aligned with the shift from an approach that is prescriptive to an approach that is characterized by flexibility, complexity, and opportunity (Silvius and Schipper 2014).

7.4 Shifts to ethical concerns and projects managers' responsibility

One of the PM principles emphasized in the seventh edition is the role of a diligent, respectful, and caring steward. Stewards are responsible actors who perform their activities with integrity, care, and trustworthiness while adhering to internal and external guidelines. Adopting a holistic perspective of stewardship involves considering financial, social, technical, and sustainable environmental factors. This new paradigm is compatible with value and ethics, also transparency and accountability principals of sustainability.

7.5 Shifts to adaptability and agility to cope with complexity and uncertainty

Sustainable project management is facing an increasing challenge of creating value and adapting to changing environments to be profitable. This challenge requires project managers to be agile, according to (Obradović, Todorović et al. 2019) sustainability and agility are complementary concepts that help managers deal with the complexity and uncertainty which is the characteristics of sustainable project management (Sabini and Silvius 2023). The agile concept can increase the flexibility, velocity, learning, and response to change (Campanelli and Parreiras 2015). Agile Project Management is used where a project goal is clear, but the way to reach that goal is not. Agility support dealing with complexity and uncertainty (Little 2005) on the other hand, emphasize joint work with all partners on a project, build project around motivated team members, promote face-to-face communication and sustainable pace (Cho 2010, Levy, Short et al. 2015) which support social identity and collective effort (Sun and Schmidt 2018), (Whitworth and Biddle 2007); the link between social sustainability and Agile project management (Valenzuela Musura and Albarosa 2017).

7.6 Shifts to proactive Stakeholder engagement

The previous versions of PMBOK had a reactive approach for Stakeholders and communication management by focusing on information and communication needs of the stakeholders and emphasizing that the project manager should provide “only the information that is needed” (Project Management Institute, 2013: 287). In PMBOK 6th edition for the first-time managing stakeholders was accompanied with the term of engagement in this knowledge area. PMI 7th edition, despite eliminating knowledge areas in the content, has maintained stakeholder engagement as either a principal and performance domain with a more proactive approach to ensure creating value and productive relationship with all stakeholders (PMBOK 7th edition) This approach is aligned with the principal of sustainability encouraging stakeholder participation.

7.7 Shifts to proactive risk management

In PMBOK 7th edition while there are no footprints of majority of knowledge areas, risk management is still maintained as a an important principal and has a precautionary approach as recommended by (Silvius, Kampinga et al. 2017). For the first time risk is seen as a more forward-looking and proactive approach. Proactive risk management improves an organization’s ability to avoid or manage both existing and emerging risks and helps adapt quickly to unwanted events or crisis. It also helps build an understanding required to measure and manage emerging risks which give organizations a better view of tomorrow’s risk and how it impacts the project. It offers methods for identifying drivers (causes) of risks so we can manage root causes rather than the symptoms of risks (Smith and Merritt 2020). So, this approach can better manage the risk and lead to risk reduction as proposed by (Silvius, Kampinga et al. 2017). This precautionary approach is compatible with the 7th principal of sustainability about risk reduction.

7.8 Shifts from management to leadership style

PMBOK 7th edition has a shift from managing teams to leading teams to promote vision, creativity, motivation, enthusiasm, encouragement, and empathy in project environment. This

stylish shift in managing people has seen as a principal to support better outcomes. Because the mentioned traits are often associated with leader rather than an authority role like management. According to the PM guide any project team member can demonstrate leadership, and this is the main contributor to sustainability goals in micro-functional level. Leadership comprises the attitude, talent, character, and behaviours to influence individuals within and outside the project team toward the desired outcomes (PMBOK 7th edition). According to (Tripathi, Priyadarshi et al. 2019) while the macro-orientations of sustainability are well researched the micro orientations have been largely ignored. This study shows that leadership impacts an organization's long-term goals and attitude toward sustainability by crafting policies, practices and supporting systems (Wang, Van Wart et al. 2014), managing projects and employees (Tabassi, Roufechaei et al. 2016) connecting and coordinating diverse stakeholders (Stephan, Patterson et al. 2016) orienting employees toward change and to be mindful toward environment and society (Slankis 2006). This sustainability theme had not been extracted from sustainability principals in existing study. However, after further research on leadership and its correlation with sustainability, it was identified as a significant change in PM standard 7th edition which supports a sustainable development through projects.

8 Conclusions

With these findings, sustainability issues are not prescriptive in nature to embed in project practices, and they can be varied in different industries (Sabini, Muzio et al. 2019). That's why standards of PM are struggling to address this issue in their content and sustainability can be perceived as a vital but disruptive issue in project management practices. The latest 7th edition of PMBOK by PMI is an implication of this issue shifting from prescriptive version (process based to more flexible guideline (principal based) with a much shorter content. The practices and standards of project management can be developed further to address the role projects play in creating sustainable development. Other PM standards including APM body of knowledge 7th edition and GPM should be investigated to understand the impacts of sustainability in project management practices. Also, study suggests to separately studying projects of different industries to identify more practical solutions. As standards have mostly general approaches to project practices, it is recommended to embed practical sustainable solutions in separate industry Extensions to PM Standards.

9 Recommendation for future:

Further research is needed to empirically identify and measure the shifts in practices to incorporate sustainability in project management.

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