

Stakeholder dynamics and their impact on value creation for industrial maintenance projects-a literature review

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Abstract. This paper analyses research developments in the dynamics of stakeholders and their impact mechanisms on the creation of value through a literature review. Three databases, Scopus, Science Direct and Google Scholar are selected to search articles. This study employs a quantitative descriptive analysis and a qualitative thematic analysis to provide a perspective of the data. The findings of the review reveal that stakeholder dynamics management is embedded in project environments and that the dynamic nature of the stakeholder salience attributes can be classified under stakeholder influence and engagement, project lifecycle and dynamics, value creation and framing, and project and stakeholder-associated risk. However, from the characterisation and the drivers of stakeholder dynamics discussed in the literature, the perspective of project risk dynamics has been understudied, with a focus mainly on stakeholder-associated risk to the project, and less on project risk and the stakeholder interactions related to potential losses or gains by stakeholders from such project decisions and activities. Although there is a recognition of the importance of managing stakeholder dynamics within project environments, the factors that affect stakeholder dynamics and their impact on the creation of value for industrial maintenance projects are still unclear. The outcome of the literature review can assist in providing the foundation for the authors' empirical work of developing a novel conceptual framework for analysing stakeholder dynamics and their impact on maximising value creation in the context of industrial maintenance projects.

Keywords: stakeholder dynamics, industrial maintenance projects, value creation.

1. Introduction

Project management literature recognises that project stakeholders are important for a project's success [1]. Previous research has provided insights into the complexity of understanding and managing stakeholders in project environments. For example, stakeholder position and level of importance within the project often change, as noted by El Wakeel and Andersen [2], and their behaviour and attitude towards a project can shift due to changing priorities, as highlighted by Postema, Groen, and Krabbendam [3]. This is further complicated by the fact that stakeholders have different interests and expectations, as per Bannerman [4], and that the “dramatically different characteristics” [5] of the different project phases create a dynamic context for managing stakeholders and their behaviour as the project moves through the different phases of its lifecycle [6]. A project manager must be skilled in managing these competing interests, maximizing the potential positive impact while minimizing any detrimental impact stakeholders can have on the project's outcome [7].

While major industrial operations typically involve complex capital equipment and

maintenance projects are prime contributors towards the overall reliability and effectiveness of the plant [8] that underpin value creation for organisations and their stakeholders, key project performance issues are often less related to technology and more related to the uncertainty introduced by the existence of multiple parties, including their level of performance and the objectives and motivation of each party [9].

Although there is a recognition of the importance of managing stakeholder dynamics [7], the factors that affect stakeholder dynamics and their impact on value creation for industrial maintenance projects are still unclear. As evidenced by the literature review, studies on stakeholder dynamics in industrial maintenance projects have received limited attention, and this study aims to address this limitation in the literature by conducting a systematic review to highlight the present theoretical and empirical developments in the domain of stakeholder dynamics within project environments. The outcome of the literature review can assist in providing the foundation for the authors' empirical work of developing a novel conceptual framework for analysing stakeholder dynamics and their impact on maximising value in the context of industrial maintenance projects.

2. Literature review methodology

The literature review is conducted in two phases with phase one focusing on context and concepts of stakeholder dynamics and phase two on stakeholder risk dynamics. The following databases were considered for searching Science Direct, Scopus, and Google Scholar. Only peer-reviewed journal articles were collected for this literature review. The keyword search terms were 'stakeholder dynamics' + 'project'. The initial search returned 443 articles of which 179 were in Science Direct, 69 papers in Scopus, and 195 articles in Google Scholar. The initial list was reviewed for duplicates and 132 duplicate records were excluded and 311 articles returned. The 311 articles were reviewed and considered to contain an overly broad category of papers of which the majority were not within the context of projects, and the search was then limited to papers that had stakeholder dynamics in their title, abstract, or keywords. In this process, 185 articles were excluded, and 126 articles were returned, with 36 articles in Science Direct, 18 articles in Scopus, and 72 articles in Google Scholar.

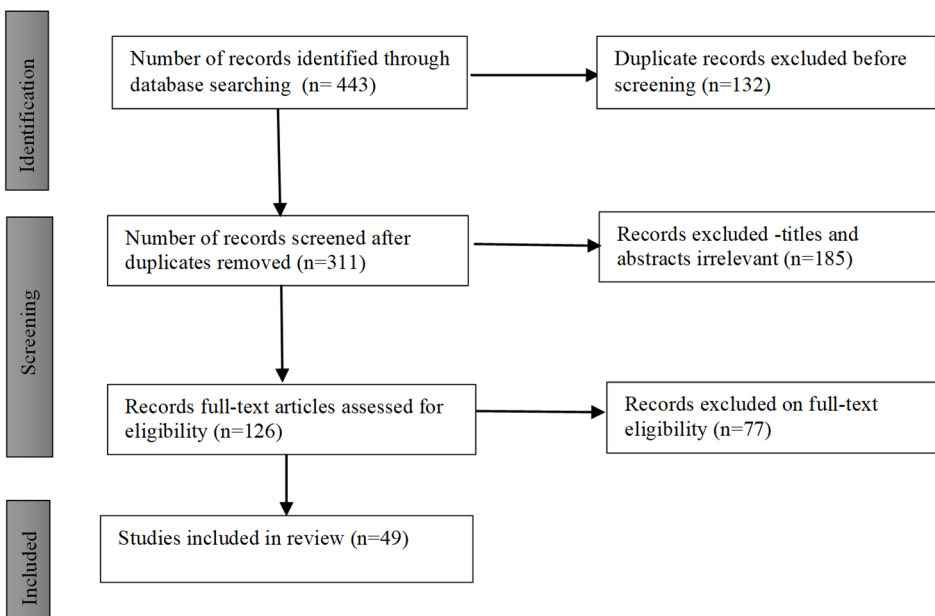


Fig. 1. PRISMA flow diagram depicting the search strategy applied

The 126 articles were downloaded in PDF format and then reviewed concentrating on the title, abstract, and relevant parts of the full text to determine the content of the paper in terms of stakeholder dynamics and whether the paper would be included in the final list. A total of 49 articles were found that were considered to provide the required insight into stakeholder dynamics and its dimensions and to be relevant for analysis. This final list with 49 articles was then further examined using both descriptive and thematic analyses. The PRISMA flow diagram visually summarises the screening process. It initially records the number of articles found and makes the selection process transparent by reporting on decisions made at various stages of the review. Numbers of articles are recorded at the different stages including the reasons for exclusion. The PRISMA flow diagram shown in Fig. 1 depicts the research strategy applied in this work.

3. Descriptive analysis

For the descriptive analyses, categories that defined the 49 articles were selected by year of publication, method, and theme. Fig. 2 shows the number of articles by publication period. The publication periods were divided into 5-year periods, and it is noted that there is an increasing trend in the number of publications, indicating a growing research interest in this topic.



Fig. 2. Number of publications by period

Fig. 3 shows the methodology used in the studies of the 49 articles. Among the different methods adopted, most articles were case studies (13 single case studies and 13 multiple case studies), followed by 8 literature review articles. The rest of the articles included surveys, experiments discursive analysis, and interviews. It is noted that most of the studies are single or multiple case studies in various sectors with infrastructure being the highest.



Fig. 3. Number of studies classified by method

4. Thematic analysis

The content of the papers was analysed to identify how the essential elements and dimensions of stakeholder dynamics in a project environment were described. Based on this work it was possible to classify the studies of the 49 articles under four themes. Fig. 4 shows the classification of findings by theme of which 21 are related to stakeholder influence and engagement, followed by 5 on value creation and framing. A further 5 studies are on project lifecycle and dynamics, with 18 studies, on project risk management and stakeholder-associated risks.



Fig. 4. Number of studies classified by theme

4.1. Stakeholder influence and engagement

The overarching theme emerging from the studies is that stakeholder dynamics are not static but evolve over time. Mulholland et al. [10] and South, Levitt, and Dewulf [11] emphasise the dynamic nature of stakeholder influence, stressing that stakeholders' interests and impact on projects undergo continuous change. This dynamic perspective underscores the need for project managers to adopt flexible strategies that adapt to the evolving stakeholder relationships throughout the project lifecycle. A second key element is the diverse values and priorities that shape stakeholder influence. Vuorinen and Martinsuo [12] categorise stakeholder influence strategies based on differing value priorities, showing the importance of aligning engagement approaches with the unique values of stakeholders. Table 1 summarises the findings of the studies by stakeholder influence and engagement.

Table 1. Summary of studies classified under stakeholder influence and engagement

Theme	Article	Focus
Stakeholder influence and engagement	[17]	Decision-making process in uncertainty. Establishing stakeholder relative importance matrix.
	[10]	Processual view of stakeholders. Stakeholders' interest and influence over time and how success and value are defined.
	[18]	Stakeholders emphasize value frameworks and value dimensions differently.
	[19]	Different stakeholder groups' perceptions of success.
	[12]	Stakeholder influence strategies are differentiated according to their different value priorities.
	[13]	Stakeholder salience and position are shaped by influence actions, management strategies, and contextual conditions.
	[16]	Analytic Network Process for assessing stakeholder influence on a project.
	[20]	Stakeholder engagement. Analyzing stakeholder perceptions.
	[21]	Differing perspectives of multiple stakeholders. Analyzing interests and positions of stakeholders.
	[22]	Changing roles and relationships affecting stakeholder networks and coalition stability.
	[23]	Stakeholder effective attributes and their engagement for stakeholder satisfaction and project success.
	[24]	Stakeholder power/influence positions and their impact on project decisions.
	[6]	A project lifecycle perspective on stakeholder influence on project management's decision-making.
	[25]	Focus on stakeholder relationship management based on the market lifecycle.
	[11]	Stakeholder networks change with project lifecycle phases.
	[14]	Stakeholder controversies and their effects on the stakeholder network.
	[15]	The operative stakeholder map. How widely networked stakeholders can introduce different and contradictory goals.
	[26]	Expectancy theory to understand stakeholders' expectations and their willingness to participate in a project.
	[27]	Different stakeholder strategies of influence for different targets.
[28]	A focus on relationship management in Megaprojects. Project issues trigger conflicting stakeholder interests.	
[29]	Tools for managing end-user stakeholder engagement for positive a project outcome.	

Altonen et al. [13] explore stakeholder salience and position, and that these are influenced by

a combination of stakeholder influence actions, management strategies, and external contextual conditions. Recognising the diversity of values and factors that shape stakeholder influence strategies is crucial for tailoring effective engagement strategies that resonate with the various project stakeholders.

Another critical aspect is the need for a systemic approach to stakeholder engagement. The studies by Lehtimäki and Kujala [14], Haapasalo and Ali [15], and Aragonés-Beltrán, García-Melón, and Montesinos-Valera, [16] collectively stress the interconnectedness of stakeholders and the potential for conflicting goals. The operative stakeholder map introduced by Haapasalo and Ali [15] exemplifies this interconnectedness, emphasizing that widely networked stakeholders may introduce contradictory goals. This calls for a holistic view of stakeholder engagement, wherein project managers consider the ripple effects of actions on the entire stakeholder network and employ effective management strategies to ensure project success.

4.2. Value creation and framing

The literature provides insights into how stakeholders contribute to and perceive value throughout various stages of projects. A recurring theme across these studies is the recognition of the multifaceted nature of value and the diverse ways stakeholders engage with and shape the value creation process.

Fuentes, Smythe, and Davies [30] shed light on the collaborative aspects of value creation. Focusing on value co-creation through stakeholder relationships, they emphasize the importance of examining how stakeholders interact to collectively generate value. Martinsuo, Vuorinen, and Killen [31] extend this perspective by exploring the framing of value at the project front end, underlining the significance of stakeholders' perceptions and interpretations in shaping the overall value proposition. Together, these studies highlight that value is not a static outcome but a dynamic process that evolves through stakeholder interactions and framing.

Contributing to the understanding of stakeholder-driven value creation by emphasizing the role of perception and opportunity exploitation, Vuorinen [32] highlights how stakeholders' perceptions of value drive their efforts to influence projects, underscoring the subjective nature of value and the need to consider diverse stakeholder perspectives. Eskerod, Ang, and Andersen [33] align by exploring project opportunity exploitation as a means to increase project value, emphasizing the proactive role stakeholders play in identifying and leveraging opportunities for value creation. This perspective aligns with the idea that value is not only co-created but can be strategically enhanced through stakeholder-driven initiatives. Table 2 summarises the findings of the studies by value creation and framing.

Table 2. Summary of studies classified under value creation and framing

Theme	Article	Focus
Value creation and framing	[30]	Examining stakeholder relationships for value co-creation.
	[32]	Stakeholders' perception of value drives their efforts to influence projects and manage value creation in temporary organizations.
	[33]	Project opportunity exploitation to increase project value.
	[31]	Framing of value by stakeholders at the project front end.
	[34]	Stakeholder relationship management. Shared purpose, holistic awareness, and linked commitment as characteristics that support positive outcomes.

Highlighting the characteristics that support positive outcomes in stakeholder relationship management, Delaine, Cardoso, and Walther [34] identify shared purpose, holistic awareness, and linked commitment as key factors. These characteristics contribute to the framing of value within the context of stakeholder relationships, emphasizing the need for a shared understanding and commitment among stakeholders to achieve positive project outcomes. This aligns with the broader theme that value is not solely a quantitative measure but is deeply intertwined with the relational and collaborative aspects of stakeholder engagement.

4.3. Project lifecycle and dynamics

These studies explore the project lifecycle and dynamics in project environments and highlight the transitions, shifts, and repositioning that occur across various project phases. Table 3 summarises the findings of studies classified under the project lifecycle and dynamics theme.

Table 3. Summary of studies classified under project lifecycle and dynamics

Theme	Article	Focus
Project lifecycle and dynamics	[35]	Transitions between project phases in public-private partnerships. Governance structures that allow division and sharing of responsibilities between stakeholders at project transitions.
	[35]	Shift from one stakeholder management profile to another. The evolving external environment and top management teams exacerbate the instability of stakeholder management profiles.
	[36]	Repositioning of stakeholder groups on the power/interest matrix across project phases. Stakeholder dynamics as a contextual phenomenon.
	[37]	A focus on characterizing and classifying project stakeholder landscapes. Key dimensions of complexity, uncertainty, dynamism, and institutional context, for evaluating stakeholder landscapes and adapting management approaches accordingly.
	[38]	Engaging external stakeholders through governance structures, values, and dynamism.

De Schepper, Dooms, and Haezendonck [35] and El Wakeel and Andersen [2] contribute to the understanding of transitions and repositioning in the project lifecycle. De Schepper, Dooms, and Haezendonck [35] focus on public-private partnerships and highlight the importance of governance structures that facilitate the division and sharing of responsibilities between stakeholders during project transitions. This emphasises the need for flexible governance models that can accommodate the changing dynamics in different project phases. El Wakeel and Andersen [2] highlight the repositioning of stakeholder groups on the power/interest matrix across project phases, emphasising that stakeholder dynamics are contextual phenomena. This contextual perspective recognises that stakeholder influence and interest levels may vary, necessitating a dynamic approach to stakeholder management throughout the project lifecycle.

Attention is brought to the evolving nature of stakeholder management profiles and engagement strategies, with Johnson-Cramer and Berman [36] highlighting the shift from one stakeholder management profile to another, driven by an evolving external environment and top management teams. This underscores the need for project managers to be perceptive to environmental changes and adjust stakeholder management strategies accordingly. Aaltonen and Kujala [37] contribute by characterising and classifying project stakeholder landscapes based on key dimensions such as complexity, uncertainty, dynamism, and institutional context. This classification provides a framework for evaluating stakeholder landscapes and adapting management approaches accordingly. The recognition of these dimensions emphasises that the project lifecycle is not uniform and that stakeholder dynamics are influenced by a combination of internal and external factors.

The studies underscore the importance of adaptable governance structures, contextual understanding of stakeholder dynamics, and flexible management strategies to effectively manage the transitions, shifts, and repositioning in different phases of a project.

4.4. Risk management and stakeholder-associated risks

The findings from these articles underscore the relationship between managing risks and engaging stakeholders for successful project outcomes. Table 4 summarises the studies classified under Risk management and Stakeholder-associated risks.

Table 4. Summary of studies classified under risk management and stakeholder-associated risks

Theme	Article	Focus
Risk management and Stakeholder-associated risks	[39]	Linking modes between risk and stakeholder management for more effective risk and stakeholder management.
	[46]	Perceived effectiveness of a project risk management practice in terms of creating value.
	[41]	Effect of stakeholder-associated risks on the success of mega-engineering projects.
	[47]	Modelling the organizational dynamics in PPPs, associated with the interactional risks using game theory to observe a range of potential outcomes.
	[48]	Contractor-perceived contractor salience and its relation to contractor-related project risks.
	[49]	Integration of risk management and value engineering for better project outcomes.
	[44]	Stakeholder engagement. The importance of overcoming barriers that impede collaborative management for an integrated perspective on complex issues in risk management.
	[43]	Strong leadership and collaboration as influential determinants for progress in uncertain environments.
	[50]	New product development project output is positively associated with risk management.
	[51]	The link between the application of project risk management practices and project success.
	[42]	Risk negatively correlates with project success, and effective risk management planning moderates the effect of risks.
	[52]	High stakeholder interactional risk levels are observed in various degrees of involvement. The dynamic nature of interactions in a project's lifetime because degrees of significance for stakeholder interactions changed in different phases of the project.
	[53]	The soft side of project risk management (strategic approach, risk communication, stakeholder relationships) significantly affects multiple project success dimensions.
	[54]	Recognizing and dealing with risks early on is critical for effective project risk management.
	[55]	Positive impact of risk management processes on project success.
	[40]	Organizational-Stakeholder fit: value congruence and strategic complementarity to understand stakeholder behavioural dynamics (conflict or compromise and cooperation).
[56]	Strategies perceived as harmful to stakeholder interests and their impact on the value creation system.	
[45]	Contestations around the materiality of impact measurements. (power dynamics, conflicts between materiality norms and standards, and differing stakeholder motivations).	

Highlighting the interconnectedness of risk and stakeholder management. Xia et al. [39] emphasise the importance of linking modes between risk and stakeholder management to enhance the effectiveness of both processes. This integrated approach recognises that risks often arise from stakeholder interactions, and addressing these risks requires a collaborative effort. Furthermore, Bundy, Vogel, and Zachary [40], explore organisational-stakeholder fit, emphasising the significance of value congruence and strategic complementarity to understand stakeholder behavioural dynamics and that recognising and aligning organisational and stakeholder goals is crucial for managing conflicts and fostering cooperation.

Focusing on mega engineering projects, Aladag and Isik [41] emphasise the effect of stakeholder-associated risks on project success. On the other hand, Zwikael and Ahn [42] provide evidence of the negative correlation between risks and project success, highlighting the

moderating role of effective risk management planning. Sykes et al. [43] underscore the influential determinants for progress in uncertain environments, emphasising the importance of strong leadership and collaboration in navigating stakeholder-associated risks.

Perrone et al. [44] and Lehner, Nicholls, and Kapplmüller [45] contribute insights into stakeholder engagement and power dynamics. Perrone et al. [44] emphasise overcoming barriers to collaborative management for an integrated perspective on complex issues in risk management. Lehner et al. [45], on the other hand, explore contestations around the materiality of impact measurements, showcasing power dynamics, conflicts between materiality norms and standards, and differing stakeholder motivations. These studies highlight the importance of understanding and managing stakeholder interactions and power dynamics for effective risk management.

5. Conclusions

The studies provide valuable insights into the complex interplay of stakeholder perceptions, risk management, project dynamics, and performance, emphasising the necessity of an adaptive approach to managing stakeholder dynamics in project environments. This understanding lays the groundwork for an opportunity to develop a stakeholder dynamics management framework. Tailored to address risks tied to stakeholder dynamics, this framework would recognise the diverse stakeholder perceptions of value, acknowledging their potential to either spark conflicts or foster synergies. Within this framework lies the potential to craft mechanisms for identifying, analysing, and aligning these perceptions to enhance project value creation. Strategies within the framework would also assess and harness the influence of stakeholders. Moreover, the findings underscore that successful project outcomes hinge on synergistic risk and stakeholder management, aligning organisational and stakeholder goals.

The acknowledgment of the evolution of stakeholder dynamics across project lifecycle stages is crucial. Understanding these changes is key for effective management, necessitating adaptive stakeholder strategies tailored to the specific needs and challenges of each project phase. Ongoing alignment of stakeholder interests maintains positive relationships and ensures continued harmony with project objectives.

In moving forward, the opportunity to develop a stakeholder dynamics management framework holds significant promise. Tailored to the diverse perceptions and influence dynamics of stakeholders, such a framework is expected to stand as a systematic approach to enhance project value creation, mitigate risks, and optimise outcomes throughout the project lifecycle.

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Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Author contributions

Mufaro Masarira: methodology, writing-original draft preparation, revision. Amir Rahbarimanesh: methodology, resources, review, supervision. Kassandra Papadopoulou: supervision, review and editing. Jyoti Sinha: supervision, review, oversight and mentorship.

Conflict of interest

The authors declare that they have no conflict of interest.

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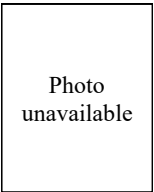
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