Project Phase Emphasis in Public Transportation Management: A PESTLE Perspective

Carl Jackson
Albertus Magnus College, New Haven, CT. USA

Tami Moser
Southwestern Oklahoma State University, Weatherford, Oklahoma, USA
tami.moser@swosu.edu

[Abstract] This study explores perceptions of project phases and ranks their importance during projects and that phase emphasis factors differently during public transportation projects than other industries. Although substantial funding is available for infrastructure improvements, public transportation agencies cannot deliver projects on time and within budget. This study reviews the literature on performance issues and uses project management and PESTLE analysis, applying thematic coding to gain insights from participants' experiences. The study finds project managers emphasize economic, technological, and political factors as central themes, while environmental, legal, and sociological factors are emphasized as minor themes. Iteratively managing these minor themes throughout the project life cycle improves performance and mitigates risks.

[Keywords] project management, phases, life cycle, PESTLE, PMBOK, public transportation

Introduction

Project management is prevalent in the public transportation industry, typically following a linear project life cycle from inception to conclusion. This framework is based on A Guide to the Project Management Body of Knowledge (PMBOK) by the Project Management Institute, the primary source for certified project managers. PMBOK states, "a project is a temporary endeavor undertaken to create a unique product, service, and result" (Project Management Institute, 2017, p. 13). This definition encompasses scope, schedule, budget, and life cycle differences.

This study examines public transportation projects to gather data from industry practitioners. Their experiences provide insights into managing projects across various phases and life cycles, particularly concerning political, economic, social, technological, legal, and environmental (PESTLE) factors. These insights aim to enhance practitioners' understanding of historical delivery issues while emphasizing microeconomic factors for improving future project performance.

Literature Review

Managing public transportation projects presents significant challenges (Elnaz et al., 2020; Mann & Bykowicz, 2022; Taghinezhad et al., 2021). The 2022 federal infrastructure package allocates over $1 trillion for improvements, but effective fund management requires a fresh approach. Public transportation project managers need to be able to calculate scope, schedule, and budget deadlines better (Morris et al., 2011). Elnaz et al. (2020) identified "team qualifications" and "quality management" as key contributors to mediocre performance (p. 322). These deficiencies present project and risk and explain why risk management is critical, especially with extended timelines and communication barriers (Morris et al., 2011).

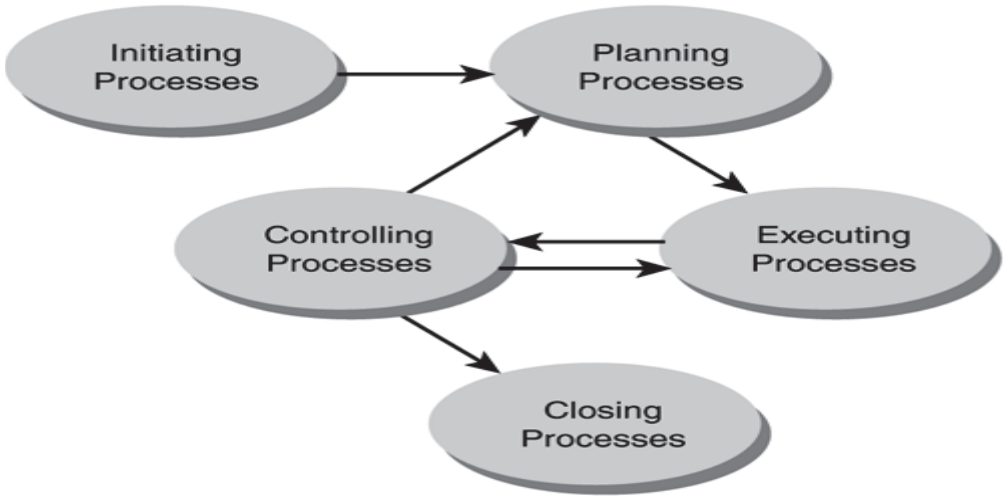
Public transportation projects require extensive planning and involve Metropolitan

Planning Organizations (MPOs), whose governance can strain project management (Sciara, 2017). U.S. public transportation infrastructure costs are higher than in other countries (Brey, 2022; Devitt, 2022), with aging infrastructure complicating management (Renn, 2022). Project complexity, budget alignment, and schedule adherence are significant hurdles (Nguyen et al., 2019; Park, 2021; Durdyev, 2020). Nguyen et al. (2019) linked deficient performance to complex resource allocation. Park (2021) found that schedule delays often stem from disconnects between project scope and delivery.

Usmani (2022) and Martens & De Carvalho (2017) emphasized mastering the PMBOK's five process groups. Project management is a global phenomenon, with standards and guidelines governing its framework. While project management has always existed, the discipline began to standardize in the 1960s, leading to formal documentation and templates for improving performance. Figure 1 summarizes these tools.

Figure 1

Five Project Management Process Groups



Notes: Adopted in parts from *The Five Process Groups in Project Management* (Usmani, 2022, p. 1); Malabagi et al. (2020, p. 100013-2); PMBOK (2017, p. 18).

Project management is also a global phenomenon with broad theories. Standards and guidelines govern this worldview and theoretical framework. While project management has always existed in practice, the discipline was standardized globally in the 1960s as formal written documentation and templates for project managers to improve performance. Table 1 summarizes these usable tools.

Table 1
Background Summary of Global Project Management Standards and Guidelines

Guideline/Standard	Type	Country of Origin	First Edition
International Project Management Association (IPMA)	Competencies	UK	1965
PMI/PMBOK	Guides	USA	1997
International Competence Baseline (ICB)	Guides	Switzerland	1999
Projects in Control Environment (Prince 2)	Method	UK	1989
Association of Project Management Body of Knowledge (APMBOK)	Guides	UK	1992
International Organization for Standardization (ISO10006)	Standard	Switzerland	1997
(P2M)	Guides	Japan	2003

Notes: Adapted partly from (Abdule-Samad et al., 2021, p. 37). Among these guidelines and standards, APMBOK, PMBOK, ICB, and P2M comprise over 80% of Project Management critical elements (Abdule-Samad et al., 2021, p. 35).

IPMA competencies add crucial information to the project manager's skill sets. Within their Eye of Competence, people, practices, and perspectives synthesize into a practical, theoretical framework (Abdule-Samad et al., 2021; Monindra & Srivastava, 2019). Each corner of the triangle connotes a strategic area of focus. This theory offers project managers lenses of strategy for practitioners to consider. In the application of IPMA, projects are functional elements of larger programs. Programs include multiple projects, and project managers are assigned to each project. Figure 2 shows the theoretical framework of project manager competencies.

Figure 2
IPMA Eye of Project Management Competencies

Note: Adopted in parts from (Jaques, 2015, p. 1; Stretton, 2018, p. 3; Abdule-Samad et al., 2021, p. 42).

Negotiating project challenges through phases and processes is crucial for success. Unknown risks often emerge in the cyclic domains of planning, execution, and monitoring/control, especially in public projects (Kuczyńska & Nepelski, 2021). Although risks exist in the initiation and closing phases, managing them in the mid-range phases is key to staying within scope, schedule, and budget. This becomes more complex as project costs rise.

In the continental U.S., public transportation projects are overly complex, with risks impacting scope, schedule, and budget, leading to inferior performance (Bichao, 2020; Bray, 2022; Nelson, 2020). Nguyen et al. (2019) note that "funding constraints, technical concepts, or regulatory and environmental issues" compound these challenges (p. 384). Organizational behavior also plays a role in managing these megaprojects (Li et al., 2019). Sponsors provide funding and vision, while project managers manage the phases, requiring refined organizational theory applications, especially with new transportation funding (2022 Public Transportation Fact Book, 2023). Megaproject performance in transportation often suffers due to failures in planning and execution (Rothengatter, 2019). Accountability is critical to improving performance, especially in managing risks (Bichao, 2020; Bray, 2022; Nelson, 2020).

Advancements in technology require new tools to manage risk and complexity, as well as rethink project processes (Schindler et al., 2019). Moreover, internal, and external stakeholder relationships must evolve to accommodate changing social environments. Transportation projects impact multiple areas, and project managers and sponsors must adapt to ensure success (Broniewicz & Ogrodnik, 2020; Goel et al., 2020).

PMBOK

The *Guide to the Project Management Body of Knowledge* (PMBOK) is the primary book used and referenced for project management certification in North America. This guide provides the theoretical lens for project management in this case study. This model evolves into five "Process

Groups" and ten “Knowledge Areas” that form the theoretical basis for project management (*Guide to Project Management*, 2017, p. 25). Thirty-nine processes cross reference these process group knowledge areas in a matrix to frame the breadth of project knowledge required for project managers. However, when applied to public transportation projects, knowledge gaps exist in process group knowledge areas.

Koskela and Howell (2001) assert that the theoretical foundations of project management exist in a blend of traditional and management theories. Synthesizing these critical elements uncovers phenomena of management process knowledge areas used in project management with traditional management theories. These theories characterize projects as the "transformation of inputs and outputs" and management theory as "planning, execution, and control" (Koskela & Howell, 2002, p.3). Project management phases add phases of project initiation and closing as additional knowledge areas where theoretical applications apply to this framework. Koskela and Howell (2001) argue that "new theoretical foundations" add theories of "transformation, flow, and value generation" to projects. For management elements, "planning, organizing, control" blends with the newer theoretical framework (Koskela & Howell, 2001, p. 4).

Applying project management to public transportation project management requires foundational theories for future discourse. This idea is critical because a theoretical framework provides the foundations to build this case study. This approach also uses scholarships to gain comprehension, which is useful for uncovering data and answering research questions. In addition, this framework supports scholarship and the discovery of phenomena applicable to scholars and practitioners. This case study discusses missing elements and uses elements found in PESTEL (*PESTEL Analysis*, 2020) as microeconomic factors to uncover phenomena applicable to public transportation projects.

PESTLE

PESTLE analysis, originally PEST (political, economic, social, technological), was developed by Harvard Business School professor Francis J. Agular in 1964 as a framework for his book "Scanning the Business Environment" (Heubel, 2023, p. 3). Initially intended for business, PEST later expanded to areas like manufacturing (Guamen, 2019), construction and performance (Khalid & Rahman, 2019), and project risks (Rastogi & Trivedi, 2016). The shift from PEST to PESTLE incorporates environmental and legal factors, reflecting broader theoretical applications (Heubel, 2023).

PESTLE helps mitigate risks to scope, schedule, and outcomes (Guaman, 2019; Rastogi & Trivedi, 2016). PESTLE is essential for managing stakeholders in the political realm. Their support is crucial for project success, as highlighted by Brey (2022), who notes that elected officials promote project benefits to constituents. PESTLE also integrates sustainability into project management. Martens and De Carvalho (2017) stress the importance of economic, social, and environmental sustainability, while public transportation demonstrates environmental benefits by reducing carbon footprints (2022 Public Transportation Fact Book, 2023).

McFarlane (2021) emphasizes that infrastructure improvements drive economic growth through job creation and better access to opportunities. Technologically, PESTLE reveals innovations that enhance project management. Froese (2010) notes that computer-aided design improves project performance, potentially minimizing delays in critical safety systems (Kingston, 2019).

Complexity

Public transportation project managers face institutional, global, and organizational challenges (Villazón et al., 2020). Mamédio and Meyer (2020) define these complexities as elements contributing to "failures, unpredictability, uncertainties, and ambiguities" (p. 727). Although there is a willingness in the public sector to develop complex transportation projects, there is often insufficient institutional knowledge to manage complicated scopes (Matinheikki et al., 2019). This lack of expertise leads to creating "hybrid" organizations, combining internal staff with expert consultants (Matinheikki, 2019, p. 298). These organizations help extend internal teams' capabilities throughout the project life cycle.

Performance

Project performance is measured by how well scope, schedule, budget, and quality are maintained (Kabirifar & Mojtahedi, 2019). Khalid & Rahman (2019) note that uncovering external performance factors in complex projects is difficult, which can lead to underperformance. Key performance indicators (KPIs) help measure project health across scope, schedule, and budget (Villazón et al., 2020).

Risk

Rastogi & Trivedi (2016) found that internal data can help mitigate internal risks, but external risks require additional tools. PESTLE analysis can help identify risks not immediately apparent to project managers, especially in public transportation environments. PMI and PMBOK provide strong theoretical and practical standards (Abyad, 2018; Abdule-Samad et al., 2021). Barilovic et al. (2019) emphasizes the importance of manager competence, highlighting that IPMA focuses on knowledge, skills, and abilities in strategy, governance, and compliance. These competencies form part of IPMA's Eye of Competence, which integrates people, practices, and perspectives into a theoretical framework (Abdule-Samad et al., 2021; Monindra & Srivastava, 2019). This framework helps project managers understand projects as part of broader programs with multiple projects.

Methodology

The thematic findings from five research questions blending project management process groups and PESTLE analysis captured insights from experienced project managers in public transportation. Each question was addressed using evidence from one-hour interviews with project managers. To identify key themes, transcripts were coded using open, axial, and selective coding (Williams & Moser, 2019). This process revealed usable themes for this study—follow-up questions during interviews provided further insights into issues and constructs. Data from interviews also contributed to developing figures and tables illustrating the findings.

Participants

Participants had at least five years of experience in public transportation within the northeastern U.S., a region known for complex projects. Three participants were certified project managers or engineers, and two were project planners. The group included three women, two minorities, and their educational backgrounds ranged from bachelor's degrees to a Ph.D., highlighting a diverse range of perspectives.

Each participant was assigned a confidential identifier (P1–P5). Before interviews, participants were reminded of the confidentiality procedures, and their responses were referenced as P1–P5 in transcripts. Table 2 displays the demographic data of the participants.

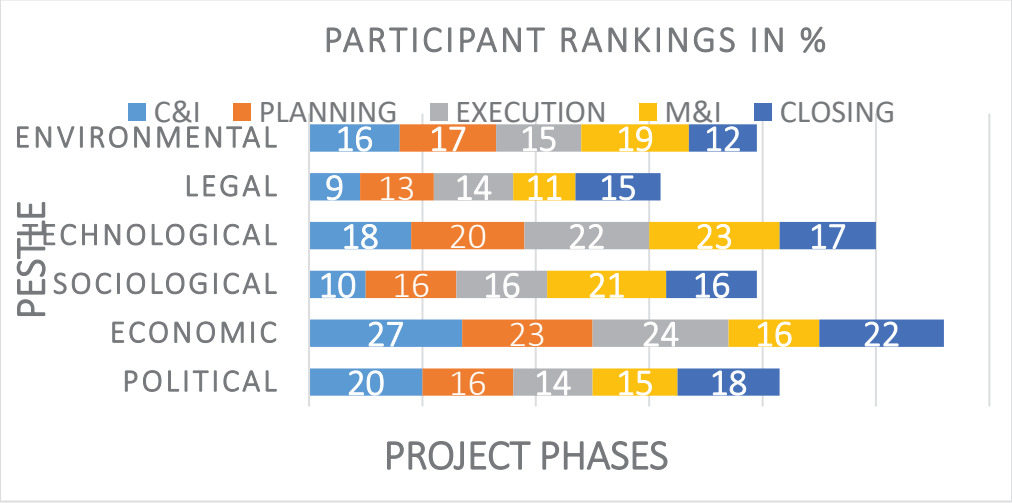
Table 2
Personnel Data of Participating Project Managers, Engineers, And Planners

Gender	Female (3)	Male (2)
Generational Cohort	Baby Boomer (2)	Millennials (3)
Diversity	Minority (2)	Other (3)
Educational Levels	Bachelors (2)	
	Masters (2)	
	Ph.D. (1)	
Years of Experience	20 – 30 Years (2)	5 – 10 Years (3)

Data Collection
Thematic findings were cross-referenced with interview transcripts, project life cycle and phases, and PESTLE. The funneling of open, axial, and selective coding was the basis for major and minor study themes. An interactive process of reading and re-reading transcripts, highlighting multi-coded passages, words, and responses to follow-up questions, assessed whether themes applied to this study.

The five participants offered insights into project management within public transportation based on five questions (Q1 - Q5). These findings, while qualitative, also lead to descriptive results. For example, Q1 – Q5 was based on six microeconomic factors within PESTLE analysis. Numerically descriptive outcomes of this thematic analysis blend PESTLE and project management theory regarding project phases. From a numerical perspective, individual responses were ranked from 1 – 6, with 6 representatives of the highest ranking per Q1 – Q5. Given these numerical assignments, blended ranking among all participants ranges from 0 to 30 for each question and response from respective participants; however, no blended responses ranked at the maximum rank of 30 or the minimum rank of 0, as illustrated in figure 3.

Figure 3
Overall Perceptual Rankings Among Respective Participants



Notes: Blended participant responses rankings from 0 – 30 based on Q1-Q5, from P1-P5. Responses to each question were studied to uncover new thematic phenomena.

This study's findings dive deeper into participant rankings and perceptions, considering how responses relate to the study problem. In addition to noted responses from participants, percentages were assigned to respective individuals' (P1-P5) responses for Q1 – 5, enabling all responses to be metricized to equal 100% but allowing for differentiation in percentiles for collective responses.

Assumptions and Limitations

The data from participants may be similar due to their shared experiences in the public transportation industry and familiarity with project management phases and challenges. However, purposeful sampling ensures differentiation among projects and experiences, as participants will provide truthful accounts of their varied backgrounds, including management, planning, scheduling, construction, and services. The aim is to gather enough data to address the study's problem and answer research questions.

A limiting factor of this study is the sample size. The public transportation industry received $42 billion in public funding across all 50 states (2022 Public Transportation Fact Book, 2023). Thus, focusing solely on northeastern participants may overlook crucial perspectives. Nonetheless, usable data will reflect perspectives from urban and rural project management experience, as urban projects often involve multimillion-dollar budgets, while rural projects are smaller in scale.

Findings-Major Themes

Factors Perceived to Be Critical During Conception & Initiation

Participants emphasized the importance of economic factors during project conception and initiation and felt reassured by the availability of sufficient funding, which justifies project initiation findings. P5 stated, "So, from my experience, I believe that economics will rank as number one because finances need to be looked at to see if there is enough budgeted." The microeconomics factor in PESTLE that funnels into these codes is economics. This finding matches the responses of participants under direct questioning by the investigator. For example, P2 responded, "Working with the budget is critical to establishing if there are budget constraints." P3 commented, "Economic circumstances probably have something to do with whether that project actually comes to life."

Perceptions from participants show that 27% of their responses conclude economics is critical to project conception and initiation of a project. This is the highest ranking among participants. Twenty percent have political factors as critical. Eighteen percent of perceptions were technological. Sixteen percent of perceptions were environmental factors. Ten percent of perceptions were sociological factors. Nine percent of perceptions were legal factors.

Figure 3 illustrates how participants responded to Q1 and their collective qualitative perceptions of PESTLE phenomena during project initiation phases. Participants were clear with their responses regarding the economic significance during inception and initiation. However, those perceptions focused on fund availability to successfully manage projects through all phases. This notion emerged based on participant's responses during the planning and execution processes.

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Factors Perceived to be Critical During the Planning Phase

Economic conditions influence project planning, tying economics to project scope and contracts. P3 noted that funding impacts project features and deliverables: "So, our budget for building the Wi-Fi networks in each station was based on those contract signings." P3 commented, "I think when you are planning a project, the budget has a lot to do with it. So, depending on the economic conditions at the time, I think that will have a big impact." In addition, scoping emerged as a critical factor in project planning beyond pricing, as P3 noted, "So you have to develop a scope of work of how you are going to fix a problem, which requires money." Yet, other economic factors emerged in responses. For example, P3 also stated "I think at this stage, you are also potentially drawing up contracts and working out agreement terms between all the parties involved." These factors emerged regardless of the thematic outcomes.

Narrower percentage variations between PESTLE factors emerged from perceptions. For example, 21.9% perceive the critical element to be economic factors. Nineteen percent perceived technological elements as critical elements of planning. Sixteen percent perceive environmental factors as critical to planning. Fifteen percent perceived political factors were critical to planning. Twelve percent perceived legal factors are critical to planning.

Factors Perceived to Be Critical During Execution Phase

Participants indicated that project execution reveals actual costs and funding challenges. Delays can occur if funding does not cover scope changes. P2 remarked, "Cost becomes an issue. We must develop an investment plan to determine how we fund projects for the next four years." Once again, economic themes emerged for the research question, which corresponds to perceptions given by participants under direct questioning. This theme aligns with economic elements as the dominant PESTLE factor. For example, P2 commented, "So economics plays a big part in projects when we are doing life cycle cost analysis. You must consider inflation built into the analysis when we are coming up with a budget for improvements." When thinking about project execution, funding and affordability is perceived as critical because, as P4 states: "At this phase, we are trying to see how best to implement this project, and cost becomes an issue. We are looking at what will be able to help execute or implement this project at the most affordable cost."

Participants' perceptions of economics accounted for 23% of perceptions during project execution. Twenty-one percent of participants perceived that technological factors were critical. Fifteen percent of participants perceived sociological factors as critical. Fourteen percent of participants perceived environmental factors as critical. Thirteen percent of participants perceived political factors as critical. Perceptions of legal factors by participants also emerged as 13%.

Factors Perceived to Be Critical During Project Closeout

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Findings-Minor Themes

Technological

Technology is viewed as a critical tool for monitoring project elements, helping identify anomalies during project life cycles. P5 highlighted, "I would put technology as number one... to facilitate and create a successful project."

Political

Participants had mixed views on the role of politics in project management. While political support is necessary for funding, political agendas can cause scope creep and project delays. P5 explained, "Many times if we have a project that has public funding... we also have political agendas that are aligned or out of step." As projects progress, the involvement of elected officials increases, making communication with them essential for project success.

Thematic application of interviews uncovered that politics is a significant factor in project closing. For example, P2 shared the following perception:

> What I'm trying to do is kind of transition from the current project to the next. Sometimes there is political influence when you move from one project to another. I hate to say it, but the governor wants a certain outcome, and he has some influence on projects, so scheduling becomes disruptive if you try to move to different projects.

Given the Q5 themes and examples, qualitative descriptions uncovered that the political element represents 21.90% of participants' perceptions. Economic factors were perceived as critical, represented by 20.95%. Technological factors were perceived at 16.19%. Sociological factors were perceived at 15.24%. Legal factors were perceived at 14.29%. Environmental factors were perceived at 11.43%.

Minor Findings

Legal

Participants viewed the legal aspect of public transportation projects as primarily related to policy and contractual obligations between agencies and contractors. Legal intervention is seen as necessary only when issues arise. P5 noted, "I do not think there should be room for many mistakes in the legal realm." There is concern regarding whether specific policy actions require legal input,

with P4 commenting, "Is it legal? Are we breaking any law in trying to pursue this project?" Rastogi and Trivedi (2016) emphasize that legal considerations should be present in all project phases, ensuring compliance with labor laws and pay schedules.

Sociological

Four out of five participants regarded sociological factors as a diverse issue, often viewed as less technical and more of a policy requirement. P1 noted that "they always get this wrong." Most participants ranked social elements low in importance, with P5 stating, "I have social at number five." However, P2 highlighted the need to consider impacts on underrepresented communities.

Environmental

Project managers viewed environmental factors as part of technical analysis, with P1 stating, "The technical analysis... will make sure it understands the environmental impact." While some participants noted environmental concerns alongside economic factors, it did not emerge as a critical theme. Non-verbal responses showed frustration with political factors but comfort with technical aspects.

Discussion

This study gathered insights from public transportation project managers using Project Management Institute (2017) and PESTLE analysis (PESTEL Analysis, 2020) frameworks. These tools helped rank microeconomic factors in government-funded transportation projects (Elnaz et al., 2020; Mann & Bykowicz, 2022; Taghinezhad et al., 2021). To enhance project management, PESTLE factors must strengthen managers' capabilities (Guamen, 2019). While economic, political, and technological themes dominate project initiation and execution, environmental, legal, and social factors should be elevated throughout all phases to improve public transportation project performance.

Economic Factors

The PESTLE factor of economics emerged as a crucial area, ranking at 27%. Participants highlighted challenges in obtaining project funding, echoing the ambiguity noted by Mamédio and Meyer (2020). During project life cycles, uncertainty arises, with money often seen as the primary solution. Unplanned project phenomena and competency questions regarding project managers emerge from stakeholder scrutiny. Performance factors identified by Kabirifar & Mojtahedi (2019)—scope, schedule, budget, and quality—are complex for public transportation project managers, compounded by limited budget flexibility, as Mamédio and Meyer (2020) noted. This complexity explains participants' emphasis on economics during project inception, planning, and initiation.

Technological Factors

Technology ranked as the leading factor for Q4 at 21.9%, defined by public transportation project managers as systems design, data, networks, and scheduling systems. These technologies help identify scope, schedule, and budget anomalies, aiding project compliance through KPI analysis (Villazón et al., 2020). Lia et al. (2020) stress the importance of concurrent technological and transportation planning for improved performance. Monindra and Srivastava (2019) also emphasize the need for risk mitigation and project innovation to manage uncertainty effectively.

Political Factors

Political factors accounted for 21.9% of participant responses for Q5. Public transportation project managers need help to secure government funding, leading to political grappling over project advancement. While managers recognize public benefits, funding decisions often rest with elected officials. Bichao (2020) highlights political influence on project timelines, particularly during cost overruns. Nelson (2020) notes the necessity for government agreement on these overruns, exacerbating frustration among project managers as funding allocation becomes a political decision.

Sociological Factors

Sociological factors ranked low among participants, though Q4 saw a rise to 20%. Successful projects must align with community needs (McFarlane, 2021). Project managers must comply with diversity, equity, and inclusion requirements and ensure that underrepresented populations participate in contracts, while high costs of programs often frustrate community leaders advocating for local funding (Devett, 2022). The lack of diverse representation on funding boards, as noted by Sciara (2017), compounds these issues.

Legal Factors

Legal factors ranked lowest overall, except for Q5 at 14.29%, just above environmental factors at 11.43%. Project managers view legal elements as a hidden, iterative process. Khalid and Rahman (2019) argue that environmental, regulatory, and project documentation significantly influence performance. Rastogi & Trivedi (2016) stress the importance of monitoring all legal aspects throughout project life cycles, with compliance required for contractor agreements and procurement terms.

Environmental Factors

Environmental factors, including climate and safety, are critical (Khalid & Rahman, 2019) but ranked lower at 18.1% in Q4. This is notable given public transportation's role in reducing fossil fuels (Farghali et al., 2023). Regulatory compliance issues require attention, though technical aspects often take precedence, leading to lower awareness of environmental risks needing remediation.

Canvas Model

Canvas models are highly effective tools in project management, providing a structured yet flexible framework to visualize and align project elements across phases. This visual clarity aids in identifying potential risks and opportunities, ensuring that project objectives align with broader environmental and strategic contexts. Moreover, the iterative nature of minor themes like environmental and legal considerations emphasizes adaptability, enabling teams to respond dynamically to evolving challenges and stakeholder needs. A business canvas model was constructed to illustrate project phase emphases. Figure 4 illustrates this concept.

Figure 4
Project Canvas Model

<table>
<tr><th colspan="6">Project Canvas Model
Themes, Process Groups, and PESTLE</th></tr>
<tr><td rowspan="2">Project Life Cycles/ Process Groups</td><td>Conception & Initiation
. Budgets
. Money
. Finance</td><td>Planning
. Scope
. Politics
. Contracts</td><td>Execution
. Investments
. Affordability
. Costs</td><td>Monitoring & Control
. Schedule
. Adherence
. Community
. Networks
. Data
. Design</td><td>Closing
. Influence
. Government
. Visibility
. Politicians
. Collaboration</td></tr>
<tr><td>Resources</td><td>Policy</td><td>Funding</td><td>Systems & Information</td><td>Communications & Relationships</td></tr>
<tr><td>Major Themes (PESTLE)</td><td colspan="3">Economics</td><td>Technological</td><td>Political</td></tr>
<tr><td>Minor Themes (PESTLE)</td><td colspan="5">Environmental Legal Sociological
Iterative</td></tr>
</table>

Notse: Model was designed partly from the Social Enterprise Canvas Model by Sparviero (2019) and brings together themes, project life cycle, project phases, and PESTLE factors included in this study. Blue colored text synthesizes thematic findings and themes.

Implications for Project Managers in Public Transportation

During the discussion, participants emphasized the critical role of funding in ensuring the success of projects. They also highlighted the need for enhanced training in financial tools, such as earned value analysis from the PMBOK guide (2017). This kind of training would particularly benefit public transportation managers, enabling them to adopt global financial standards and enhance their understanding of economic dynamics within project environments (Abdule-Samed et al., 2013).

Focus on Stakeholder Communication

Effective communication with stakeholders is essential, especially in public transportation, where political and community dynamics complicate projects (Mamédio & Meyer, 2020). Public transportation managers must improve their use of project charters to communicate project benefits to stakeholders (PMBOK, 2017). P2 commented, "This is the most important document for projects, but in our organization, we just will not use it."

Elevate Environmental Project Team Awareness

Environmental risks must be managed proactively across all project phases to avoid unnecessary delays (Heubel, 2023). Public transportation managers should only delegate environmental assessments to planners and integrate them into each project phase to ensure compliance and risk mitigation.

Future Research

More understanding is needed on less prioritized factors of legal, sociological, and environmental elements in public transportation project management. These factors present significant risks if not addressed (Ullah et al., 2021). Continuous research and exploration of these areas are crucial to improving public transportation project performance and mitigating historical underperformance.

Conclusion

Thematic findings combined project management theories with PESTLE analysis to uncover how project phase emphasis improves performance in project processes and life cycles. Economic, technological, and political themes require emphasis during project conception, initiation, and planning. Emphasizing legal and social factors ensures compliance across all project phases, reducing risks and improving outcomes. These insights contribute to the knowledge of managing public transportation projects and offer valuable tools for future research and practice.

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