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The Role of Organizational Information Technology Strategies in Enhancing Participatory Management

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Abstract

The present study aims to examine the role of organizational information technology strategies in enhancing participatory management. In terms of purpose, this research is applied, and in terms of method, it is descriptive-correlational. The statistical population of the study consists of 145 managers and IT experts in export-oriented businesses, from which 105 individuals were selected using Cochran's formula and a random sampling method. To collect the required data, a researcher-made questionnaire based on a 5-point Likert scale was employed. The content validity of the instrument was confirmed by specialists and experts, and Cronbach's alpha and composite reliability methods were used to assess its reliability. After distributing the questionnaire, the construct validity (outer model), convergent validity (AVE), and discriminant validity of the instrument were evaluated. The AVE value for all variables should be greater than 0.5. To test the research hypotheses, structural equation modeling was performed using Smart PLS 2 statistical software. The findings of the study indicate that all research hypotheses were confirmed. Accordingly, goal and approach setting, the use of capabilities and resources, and the anticipation of potential opportunities and challenges in IT strategies have a significant impact on enhancing participatory management.

Keywords: Information Technology Strategy, Participatory Management, Technology Management.

1. Introduction

Decision-making and its role in organizations can be examined from multiple perspectives (Parsakia et al., 2023). Kreitner (1999) argues that good management can be defined as the effective coordination of organizational personnel (Kreitner, 1999). Mullins (2000) and Moorhead and Griffin (2008) assert that decision-making is one of the first and most important steps in management (Moorhead & Griffin, 2008; Mullins, 2000). Decision-making criteria and their nature vary in type and scope. For instance, Weber's (2009) bureaucracy theory has been widely criticized, yet no viable alternative model has been proposed. Scholars and professionals often use the term “red tape” to criticize Weber’s model. While the scientific management model proposed by Taylor (1919) emphasizes the need for employee participation in decision-making processes, it is, in practice, quite similar to the bureaucratic model (Taylor, 1919). Participatory-based management models have been supported by many researchers (Miller, 2015; Mullins, 2000; Weaver, 1974).

Participatory management is a philosophy and managerial approach in which employees at all levels of an organization are involved in planning and decision-making to optimize organizational effectiveness. In its full expression, this management combines an organizational structure designed for participatory governance with leaders who adopt a participative leadership style. Participatory management can be applied across a wide range of work contexts using various managerial techniques (McKee et al., 2013; Pašalić & Ćukušić, 2024). The most common work contexts where studies have demonstrated participatory management in action include core work processes (such as planning), communication (e.g., employee surveys, information sharing), training and development, and goal setting (both individual and organizational, such as participatory strategic planning). Perhaps the least frequent but most impactful aspect of participation involves engaging non-managerial employees in higher-level decision-making roles (Bernardes et al., 2017).

Advocates of the participatory model argue that the true implementers of a decision are the stakeholders and various levels of employees. Thus, the participatory model not only facilitates decision implementation but also enhances communication among those involved in the process. Existing management systems, particularly those emphasizing vertical structures, no longer meet the expectations of managers, employees, and especially stakeholders. In these traditional or "old" leadership methods, control is emphasized, as more individuals are under the direct supervision of managers with broader operational scopes and responsibilities (McKee et al., 2013; Rocha & Trevizan, 2009). Accordingly, with the emergence of contemporary organizational structures and management models, a fundamental transformation is occurring in organizations within today's dynamic and competitive world. Managers are striving to incorporate the values and principles of participatory management into their daily strategic practices, especially considering technological advancements (Muchunguzi, 2023). Information sharing can be regarded as one of the manifestations of applying participatory knowledge management. In this regard, the implementation of information technology strategies will significantly contribute to enhancing participatory management.

Strategic IT planning aligns technological initiatives with business objectives and ensures that IT investments are both targeted and cost-effective. The IT strategy, as the output of such planning, is a comprehensive plan that guides the use, selection, implementation, and management of technology to achieve specific business goals and adapt to evolving market dynamics (Rachmad, 2021). An effective IT strategy can help organizations improve operations, streamline processes, enhance productivity, and reduce costs. IT strategy is a holistic roadmap that demonstrates how an organization utilizes technology to accomplish its aims and objectives. This roadmap includes the alignment of the organization's business strategy with its IT strategy to maximize the value of technology investments (Mithas & Rust, 2016).

In reviewing the literature, several studies have underscored the critical role of information technology and participatory strategies in organizational and urban management. Yavari and Ahangari (2024) investigated the impact of information and communication technology (ICT) on stakeholder participation and smart urban sustainability in Tehran, confirming significant relationships among ICT, stakeholder involvement, and sustainability indices (Yavari & Ahangari, 2024). Similarly, Angazi Qods et al. (2022) proposed a science and technology policy model aimed at enhancing employee participation in knowledge-based organizations, suggesting its utility as a foundational policy framework (Angazi Ghods et al., 2022). Hashemi Farsi and Hashemi Farsi (2022) explored the concept, methods, and implementation barriers of participatory management, providing practical guidelines for its successful application (Hashemi Farsi & Hashemi Farsi, 2022). Abbasi et al. (2020) emphasized participatory management through suggestion systems in Iran's administrative organizations, analyzing its principles, objectives, and operational features (Abbasi et al., 2020). On the international front, Pasalik and Cukusic (2024) examined factors influencing e-participation acceptance in local governments, highlighting the roles of ICT infrastructure, top management support, and public readiness, though noting limited moderating effects of senior management (Pašalić & Ćukušić, 2024). Simonofski et al. (2021), through a comparative study of smart cities in Sweden and Belgium, identified five contextual factors—smart city focus, participation drivers, centralization level, legal requirements, and citizen characteristics—as crucial to shaping citizen participation strategies, thereby emphasizing the context-dependent nature of participatory approaches (Simonofski et al., 2021).

As today's work environments become increasingly complex and dynamic, there is a growing need for a participatory approach in decision-making and problem-solving processes within organizations. In this context, information technology can play a decisive role in improving organizational decision-making by providing the right tools and enablers for employee

participation (Buchanan, 2024). In the current digital age, IT strategy has become a fundamental component of business strategy, enabling organizations to leverage technology to gain competitive advantages, meet customer needs, and adapt to market changes (Nugraha et al., 2021). An effective IT strategy can also empower organizations to optimize and align their IT investments with business priorities. With a well-defined IT strategy, organizations are better positioned to make informed decisions regarding technology investments, thereby avoiding inefficiencies and missed opportunities (Shamsuzzoha et al., 2021). Despite the high potential of IT to facilitate communication and improve management processes, many organizations still face significant challenges in effectively leveraging these technologies to strengthen employee engagement and participatory decision-making. Therefore, the present study, aimed at examining the impact of IT strategies on enhancing participatory management, may serve as an effective step toward improving management processes and increasing organizational efficiency and effectiveness in today's complex and highly competitive environment. Accordingly, the research hypotheses and conceptual model are proposed as follows:

Hypothesis 1. Defining goals and approaches within IT strategies has a significant effect on enhancing participatory management.

Hypothesis 2. Utilizing capabilities and resources within IT strategies has a significant effect on enhancing participatory management.

Hypothesis 3. Anticipating potential opportunities and challenges within IT strategies has a significant effect on enhancing participatory management.

2. Methodology

This study is applied in terms of purpose and descriptive-correlational in terms of method. The statistical population consisted of 145 IT managers and experts working in export-oriented businesses. From this population, 105 individuals were selected as the sample using Cochran's formula and a random sampling method. To collect data, a researcher-made questionnaire based on a five-point Likert scale was utilized. Cronbach's alpha and composite reliability were employed to assess the reliability of the research instrument. To evaluate the instrument's validity, content validity was established through expert judgment and confirmed. Following the distribution of the questionnaire, the instrument's validity was assessed using three methods: construct validity (outer model), convergent validity (AVE), and discriminant validity. The AVE value for all variables should be greater than 0.50. To test the research hypotheses, structural equation modeling (SEM) was performed using the SmartPLS 2 statistical software.

3. Findings and Results

Conceptual models represent a set of systematic relationships that provide a comprehensive and coherent description of the interrelations among several phenomena. Conventional models in structural equation modeling (SEM) consist of two parts: measurement models, which indicate how latent variables are defined and explained, and structural models, which show how these latent variables are interconnected.

In SmartPLS, the fit of measurement models is evaluated in terms of reliability using factor loadings and composite reliability (CR), while convergent validity is examined using the average variance extracted (AVE). For assessing discriminant validity, the Fornell-Larcker criterion is applied.

Cronbach's alpha is a coefficient that ranges from 0 to 1. A Cronbach's alpha value above 0.70 (Cronbach, 1951) indicates acceptable reliability. Composite reliability (CR), introduced by Werts et al. (1974), is considered superior to Cronbach's alpha because it evaluates construct reliability not in absolute terms, but based on the inter-correlations among the indicators of the construct. A CR value above 0.70 for each construct indicates suitable internal consistency for the measurement models.

Fornell and Larcker (1981) introduced the average variance extracted (AVE) as a criterion for assessing convergent validity and stated that the critical threshold value is 0.50.

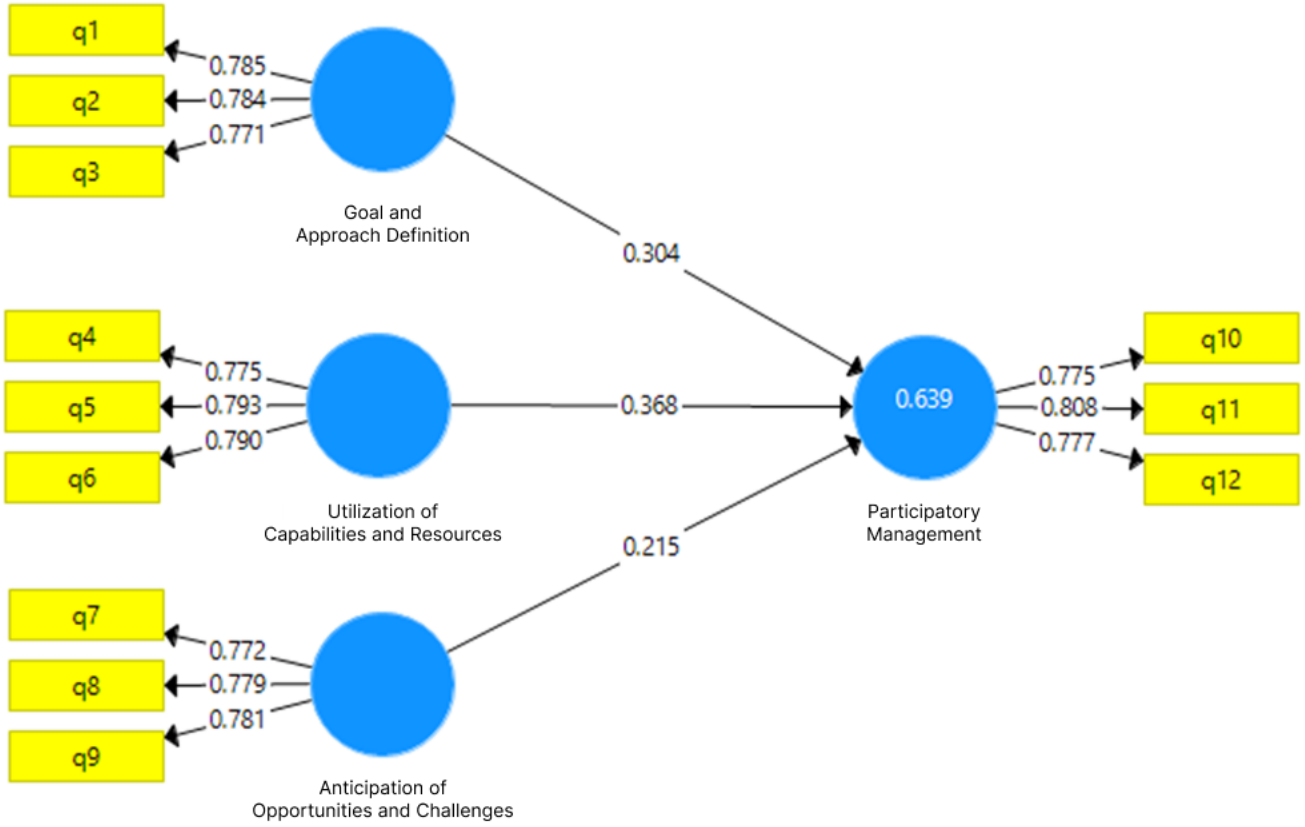

Figure 1. Model with Factor Loadings

As shown, all factor loadings exceed 0.40.

Table 1. Cronbach's Alpha, Composite Reliability, and Convergent Validity

Variables	Cronbach's Alpha	Composite Reliability	AVE
Utilization of Capabilities and Resources	0.792	0.829	0.618
Goal and Approach Definition	0.779	0.824	0.609
Participatory Management	0.792	0.830	0.619
Anticipation of Opportunities and Challenges	0.772	0.821	0.604

As shown in Table 2, the square roots of the AVE values for the latent variables in this study—positioned on the diagonal of the matrix—are greater than the inter-variable correlations in the cells below and to the left of the diagonal. This indicates a good model fit in terms of discriminant validity for the measurement models.

Table 2. Fornell and Larcker Table

Variable	Utilization of Capabilities and Resources	Goal and Approach Definition	Participatory Management	Anticipation of Opportunities and Challenges
Utilization of Capabilities and Resources	0.786			
Goal and Approach Definition	0.705	0.780		
Participatory Management	0.732	0.722	0.787	
Anticipation of Opportunities and Challenges	0.696	0.737	0.696	0.777

Table 3 evaluates the structural model fit. For this purpose, R^2 and Q^2 values were calculated for the endogenous variables of the research model.

Table 3. R Square and Q^2 Values

Endogenous Variable	R^2	Q^2
Participatory Management	0.639	0.376

R^2 is a criterion used to connect the measurement and structural components of structural equation modeling. It indicates the extent to which an exogenous variable affects an endogenous variable. Importantly, the R^2 value is calculated only for dependent (endogenous) constructs and is zero for independent (exogenous) constructs. The higher the R^2 value for the endogenous constructs, the better the model fit. Chin (1998) considers the threshold values of 0.19, 0.33, and 0.67 as indicators of weak, moderate, and strong structural model fit, respectively, based on R^2.

The R^2 value in Table 3 indicates that the effect of exogenous variables on the endogenous variable is strong.

Q^2 assesses the model's predictive power. Models with acceptable structural fit should be capable of predicting indicators related to the model's endogenous constructs. According to Henseler et al. (2009), Q^2 values of 0.02, 0.15, and 0.35 indicate weak, moderate, and strong predictive relevance, respectively. The Q^2 value in Table 3 demonstrates strong predictive relevance for the model.

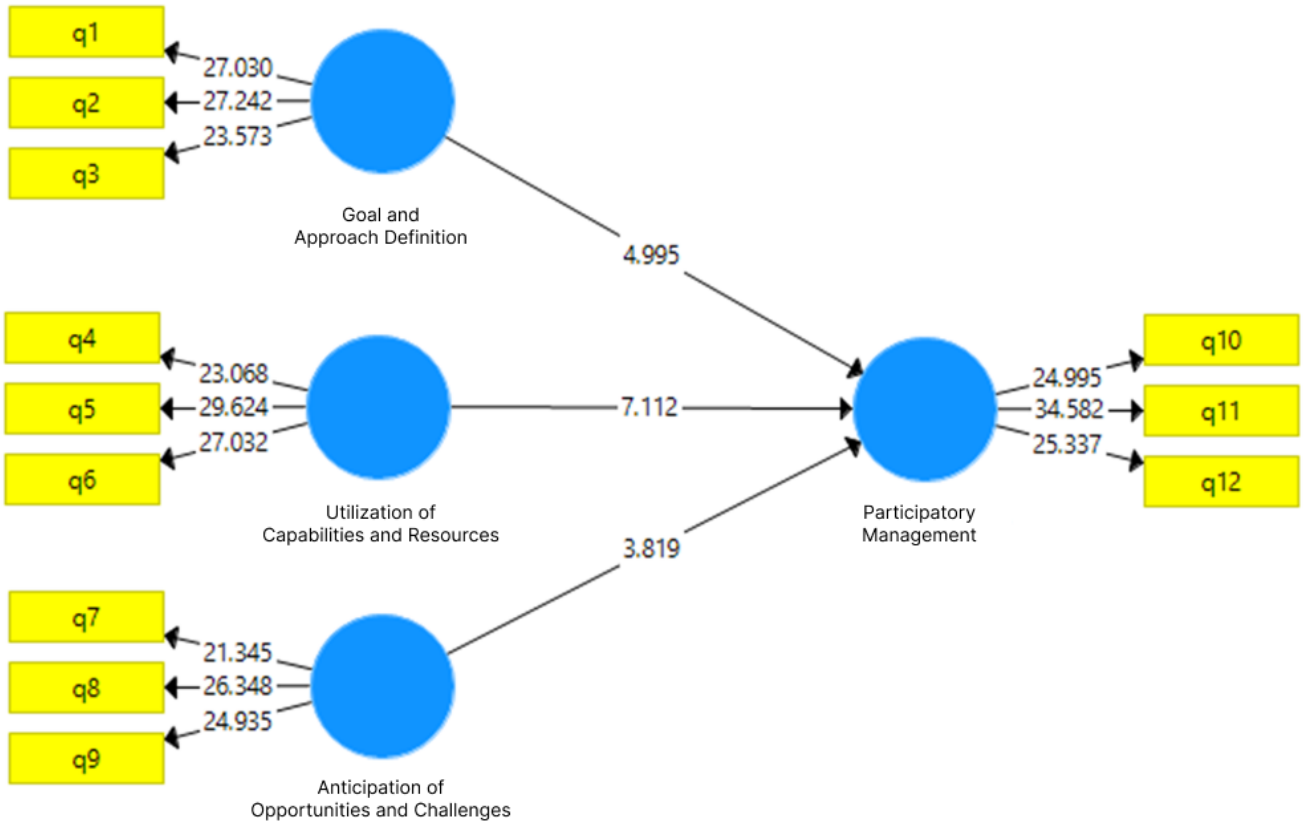

Figure 2. Structural Equation Model with Z-Value Significance Coefficients

Structural model fit using t-values requires that these values exceed 1.96 to confirm statistical significance at the 95% confidence level. However, it is important to note that t-values only confirm the validity of relationships and do not measure the strength of relationships between constructs. Path coefficients indicate whether the effect of one variable on another is positive or negative.

Table 4. Hypothesis Testing Results

No.	Path	Path Coefficient	t-Statistic	p-Value	Result
1	Utilization of Capabilities and Resources → Participatory Management	0.368	7.112	0.000	Confirmed
2	Goal and Approach Definition → Participatory Management	0.304	4.995	0.000	Confirmed
3	Anticipation of Opportunities and Challenges → Participatory Management	0.215	3.819	0.000	Confirmed

Based on the values obtained in Table 4, all hypothesized relationships have been confirmed.

4. Discussion and Conclusion

The results of the present study show a significant relationship between the utilization of information technology (IT) capabilities, stakeholder participation, and the sustainability of smart urban environments. Specifically, it was found that IT strategies significantly influence stakeholder involvement, which, in turn, affects the overall sustainability of smart cities. These findings are aligned with previous research that highlights the crucial role of IT in fostering effective participation mechanisms in urban management. For instance, Yavari and Ahangari (2024) confirmed the impact of ICT on stakeholder participation and smart urban sustainability (Yavari & Ahangari, 2024), with similar results found in the present study, indicating the relevance of technology in promoting sustainability. This alignment emphasizes the growing importance of digital infrastructures in shaping smart urban policies and driving sustainable practices.

The study also revealed that the effective use of IT strategies in the context of stakeholder participation directly affects the level of adaptation and resilience in urban settings, particularly within the framework of smart cities. This finding supports the results of Angazi Qods et al. (2022), who proposed that integrating IT in decision-making processes within knowledge-based organizations can significantly improve organizational responsiveness and resilience (Angazi Ghods et al., 2022). The study's results further indicate that effective stakeholder participation, enabled by technological resources, not only enhances the adaptability of urban systems but also promotes long-term sustainability. These outcomes highlight the essential nature of combining technological innovation with participatory management in achieving the goals of smart cities, a concept that is consistent with the conclusions of Hashemi Farsi and Hashemi Farsi (2022) on the role of participatory management in overcoming barriers to organizational success (Hashemi Farsi & Hashemi Farsi, 2022).

Furthermore, the study demonstrated a significant mediating role of stakeholder participation in the relationship between IT strategies and smart urban sustainability. The findings align with those of Abbasi et al. (2020), who investigated the use of suggestion systems in participatory management and highlighted the importance of employee involvement in decision-making processes. By showing that stakeholder participation mediates the relationship between IT and sustainability, the present study strengthens the argument that participatory management structures are not only crucial for decision-making but also for ensuring the success of technological interventions in urban systems. This concept is also supported by Pasalik and Cukusic (2024), who found that the adoption of electronic participation in local governments is heavily influenced by organizational readiness and the extent of involvement from key stakeholders (Pašalić & Ćukušić, 2024).

In terms of the theoretical implications, this study adds to the growing body of literature on the integration of technology and participatory management in urban governance. As Simonofski et al. (2021) noted in their comparative study of smart cities, the contextual factors surrounding citizen participation play a significant role in determining the success of smart city initiatives (Simonofski et al., 2021). The present study complements this argument by demonstrating how the specific technological infrastructures in place can influence the level of citizen engagement and, ultimately, the success of smart city projects. The findings indicate that enhancing participation through IT strategies is key to fostering a resilient and sustainable urban environment. Thus, the current study not only validates previous theoretical perspectives but also extends the understanding of how IT and participatory management intersect to influence urban sustainability.

Despite the valuable insights provided by this study, several limitations must be acknowledged. One primary limitation is the scope of the sample, which was restricted to IT managers and experts in export-oriented businesses in Tehran. While this sample provides useful information regarding the role of IT in stakeholder participation and urban sustainability, it may not fully represent the diversity of stakeholders involved in smart city projects. Future studies could broaden the sample to include a wider range of stakeholders, such as urban planners, government officials, and residents, to offer a more comprehensive understanding of the dynamics between IT, stakeholder participation, and urban sustainability. Furthermore, the study relied on a quantitative research design using a questionnaire based on a Likert scale. While this approach is effective in capturing respondents' perceptions, it does not allow for an in-depth exploration of the underlying factors that drive the relationships between the variables. Qualitative methods, such as interviews or case studies, could provide richer insights into the mechanisms through which IT strategies influence stakeholder participation and sustainability.

Another limitation of the study is its reliance on cross-sectional data, which only provides a snapshot of the relationship between the variables at one point in time. This design limits the ability to draw causal conclusions about the long-term effects of IT strategies on stakeholder participation and urban sustainability. Longitudinal studies that track these relationships over time could provide a deeper understanding of how the dynamics evolve and how IT strategies continue to shape participatory

management and urban sustainability in the context of smart cities. Additionally, the study focused on the theoretical aspects of IT strategies and participatory management, without examining the practical challenges faced by organizations when implementing these strategies. Exploring the real-world challenges of integrating IT into participatory management could offer valuable insights for practitioners and policymakers.

Given the limitations mentioned above, several directions for future research can be proposed. First, future studies should aim to expand the sample size and include a broader range of stakeholders involved in smart city projects, such as urban residents, policymakers, and other key players in urban development. This would help to ensure that the findings are more representative of the diverse perspectives that influence smart city sustainability and stakeholder participation. Furthermore, future research could explore the role of different types of IT infrastructures, such as cloud computing or artificial intelligence, in enhancing participatory management in smart cities. While this study focused on the general role of IT strategies, examining the specific technological tools used in urban governance could provide more detailed insights into how these technologies impact stakeholder engagement and sustainability.

Additionally, future research could adopt a longitudinal design to examine the long-term effects of IT strategies on stakeholder participation and smart urban sustainability. By collecting data over an extended period, researchers could track changes in stakeholder involvement and the sustainability of smart cities, providing a more dynamic view of how IT interventions shape urban governance over time. It would also be beneficial to explore the challenges and barriers that organizations face when implementing IT strategies for participatory management. Understanding the obstacles to effective technology adoption in smart cities, such as resistance to change or inadequate infrastructure, could help identify strategies for overcoming these challenges and ensuring the success of participatory management initiatives.

Finally, future studies could examine the relationship between IT strategies, stakeholder participation, and sustainability in different urban contexts around the world. Comparative studies across cities in different regions or countries could provide valuable insights into the cultural, political, and economic factors that influence the effectiveness of IT and participatory management in achieving urban sustainability. This would allow for a more global perspective on the role of technology in urban governance and help identify best practices that can be applied across various contexts.

From a practical standpoint, the findings of this study highlight the importance of integrating IT strategies into participatory management processes for the successful development of smart cities. Policymakers and urban planners should focus on creating robust IT infrastructures that facilitate stakeholder engagement and enable real-time data sharing. Ensuring that all relevant stakeholders have access to the necessary technologies and are equipped with the skills to use them effectively is crucial for fostering meaningful participation in decision-making processes.

Moreover, it is essential for city leaders to foster a culture of collaboration and transparency, where stakeholders, including residents, businesses, and government officials, can contribute to the development of smart city initiatives. This could involve regular consultations, workshops, and feedback mechanisms that allow citizens to voice their opinions and contribute ideas to the planning and implementation of urban sustainability projects. Additionally, city managers should invest in continuous training programs to enhance the digital literacy of both employees and residents, enabling them to navigate the technologies that underpin smart city solutions.

Lastly, given the significant impact of stakeholder participation on smart city sustainability, it is important to create policies that incentivize active participation from all sectors of society. This could involve providing financial or social rewards for community involvement, as well as ensuring that the benefits of smart city development are equitably distributed among all residents, particularly marginalized groups. By prioritizing inclusivity and engagement, cities can build more resilient, sustainable, and participatory urban environments that are better equipped to address the challenges of the 21st century.

In conclusion, integrating IT strategies into participatory management is essential for fostering sustainable and resilient smart cities. This study provides valuable insights into the relationship between IT, stakeholder participation, and urban sustainability, offering a framework for future research and practical applications in urban governance.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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