



EVALUATING THE ROLE OF SMART GOVERNANCE IN THE SUCCESS OF PCMC SMART CITY PROJECT USING RII METHOD

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Abstract

Smart City initiatives have been gaining increasing attention around the world due to the growing need for sustainable urban development. The Indian government launched the Smart Cities Mission to develop many cities across the country and make them more friendly and sustainable. The aim is to promote sustainable and inclusive cities that provide basic infrastructure and provide quality health care to their citizens, a clean and sustainable environment and the use of 'Smart' Solutions but smart city projects are complex and ambitious undertakings that aim to improve the quality of life in urban areas through the use of innovative technology and data-driven solutions. However, the implementation of these projects is often fraught with difficulties and challenges that can hinder their success. This paper explores the key difficulties faced by smart city projects, including issues related to funding, governance, interoperability, data privacy, and citizen participation. It also discusses the strategies that can be employed to address these challenges and ensure the successful implementation of smart city projects. Ultimately, the paper highlights the importance of a collaborative and inclusive approach to smart city development that involves all stakeholders and takes into account the diverse needs and perspectives of urban communities.

Keywords — *Infrastructure, Smart City, Urban Development, Challenges, Management* .

I. INTRODUCTION

A smart city project is a comprehensive urban development initiative that employs advanced technologies and data analytics to improve the quality of life for residents, enhance sustainability, and streamline city

operations. The idea is to use data-driven insights to better understand and address the challenges faced by modern cities, such as traffic congestion, pollution, and energy consumption [11]. By leveraging the latest innovations in technology, a smart city

project can transform the urban landscape and create a more efficient, responsive, and sustainable community. From a realistic point of view, smart city projects are not just about deploying the latest technologies; they are about using these tools to solve real-world problems and improve people's lives [14]. To do this effectively, smart city initiatives require collaboration and partnership between various stakeholders, including city government, private sector, academia, and citizens themselves [9].

A successful smart city project must be grounded in a thorough understanding of the needs and priorities of the community it serves. This requires a deep engagement with citizens and stakeholders to gather insights and feedback on the challenges they face and the opportunities they see for improvement with this input, a smart city project can identify areas where technology and data analytics can make the greatest impact [13].

Finally, a smart city project must be continuously monitored and evaluated to ensure that it is delivering on its promises and meeting the needs of the community. This requires ongoing data collection and analysis to measure the effectiveness of the project and identify areas for improvement. Smart city projects offer a promising approach to addressing the complex challenges and one of the biggest challenges faced by smart city projects is the lack of a clear vision and strategy [7]. Without a well-defined plan, it can be difficult to coordinate efforts across different stakeholders and ensure that everyone is working towards the same goals. In addition, smart city projects often require significant integrated framework can be a major barrier to progress [4]. This research aims to define the Effective and efficient management is critical to overcoming these obstacles and ensuring that smart city projects deliver on their promises. By identifying the barriers and success factors that impact the management

of smart city projects, stakeholders can work together to develop strategies that enable more effective and sustainable initiatives. Despite these challenges, there are several success factors that can enable effective and efficient management of smart city projects. One of the most important is a clear and well-defined strategy that outlines the goals, objectives, and metrics for success. This strategy should be developed in collaboration with key stakeholders, including city government, private sector partners, and citizens themselves.

II. PROBLEM STATEMENT

Smart Despite the increasing interest in developing smart cities, there are still significant barriers to the successful implementation of smart city projects. Smart city projects involve multiple stakeholders, including government agencies, private companies, and citizens. Contractors may struggle to communicate effectively with all parties, leading to misunderstandings and delays. Another issue with contractors in smart city projects is ensuring compliance with regulations and standards. Smart city projects often involve sensitive data, such as personal information or traffic data, and contractors must adhere to strict guidelines to ensure the security and privacy of this information. Additionally, contractors must comply with environmental and safety regulations to minimize the impact of smart city projects on the community. Overall, managing contractors in smart city projects requires careful planning, communication, and coordination to ensure the successful implementation of the project and the satisfaction of all stakeholders involved.

III. OBJECTIVES

- To develop a better understanding of smart city projects from a realistic point of view.

- To identify the main challenges and factors that affect smart city projects management.
- To Analyze the impact of smart project practices on project success.
- To Analyze the impact of smart city project size and context on the relationship between smart practices and project success.

IV. METHODOLOGY

A) TECHNIQUES OF DATA ANALYSIS

i) CRONBACH'S ALPHA:

For the reliability testing of data, Cronbach's alpha method was used. Cronbach's alpha is the most common measure of internal consistency "reliability". It is most commonly used when multiple Likert questions are used to form a scale, and the reliability of the scale must be determined. Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability. Cronbach's basic equation for alpha is as follows;

Where, n = number of questions, V_i = variance of scores on each question, V_t = variance of test scores.

ii) RELATIVE IMPORTANCE INDEX:

A Likert scale of 1 to 5 has been used for analysis of attributes for smart practices & Smart success criteria. A Likert scale is a type of psychometric response scale is named after Rensis Likert, and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement. The scale is named after,

- The mean values of each risk factor will be calculated by average sum formula

- Relative importance index (RII) is obtained by using below given formula:

$$RII = \frac{\sum w}{A \times N} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + n_1}{(A \times N)}$$

- RII ranges from zero to one ($0 \leq \text{index} \leq 1$).

"w" is weighting given to each criterion by the respondents it ranges from 1 to 5 where 1 is very less and 5 is very high;

"A" is highest weight;

"N" is total number of respondents;

$n_1, n_2, n_3, n_4,$ and n_5 are number of respondents for each factor affecting labour productivity.

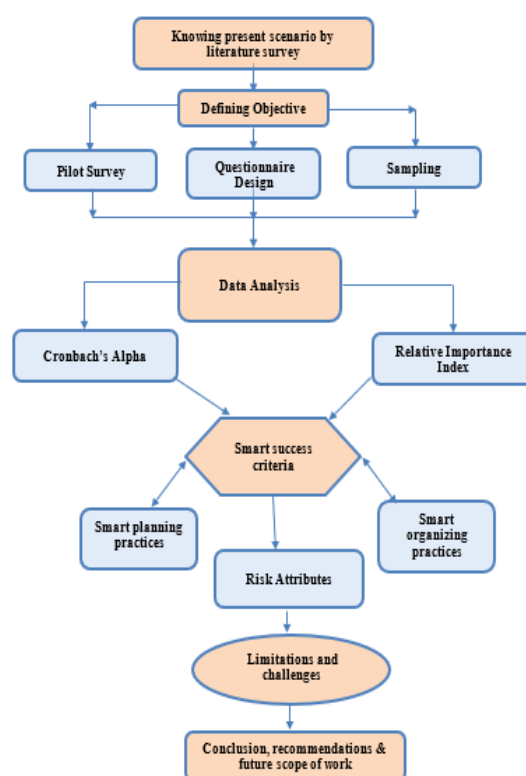


Figure 1. Flowchart of Methodology

V. DATA ANALYSIS & INTERPRETATION

Based on the scope of the study, the research has first collected data from the Smart city officials of the selected city

‘Pimpri Chinchwad’ about the Smart City facilities provided under the Smart-City initiative.

Cronbach’s Alpha- reliability report generated from IBM SPSS

Case Processing Summary			
		N	%
Cases	Valid	58	100.0
	Excluded ^a	0	.0
	Total	58	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics		
Cronbach's Alpha	N of Items	
.764	25	

Figure 2. Report of Reliability of Statistics based on Questionnaire Respondent

DEMOGRAPHIC DETAILS:

The sample size of 58 Smart city officials to collect data related to implemented practices and services under Smart city projects to understand the awareness, usage, issues, and challenges about it. The researcher has analyzed the demographic data. The resulted data have been summarized in following table.

Table 1. Demography of respondents based on smart city officials experience

No. of Respondents	No. of years of experience
9	0- 5 years
17	5- 15 years
32	above 15 years

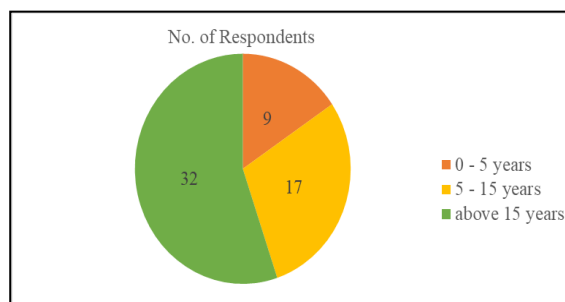


Figure 3. Pie chart of demography of respondents based on smart city official experience

Relative Importance Index Analysis Based on Reliable Attributes for Smart Integrated Framework for PCMC Smart City Project

Table 2. Impact Smart Planning Practices

Rank	Attributes	Relative Importance Index (RII)
1	Project goals are made clear to all participants	0.924
2	Customers/users are involved in the project	0.907
3	Project risk is identified	0.521
4	Project has clear deliverable objectives	0.510
5	Project size affects the planning function	0.500
6	Project management method is defined	0.490
7	Business model is well determined	0.490
8	Citizens support the project	0.479
9	Project sponsors strongly support the project	0.303
10	Local government supports the project	0.293

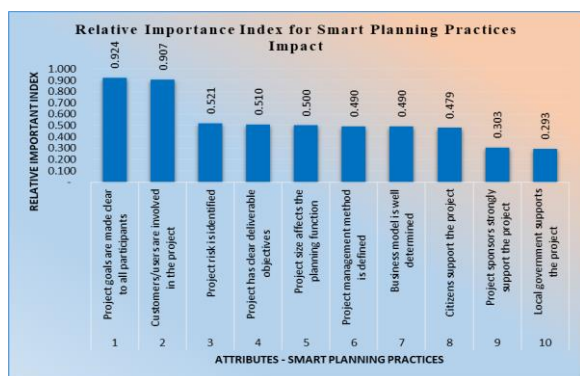


Figure 4. RII for Smart Planning Practices Impact

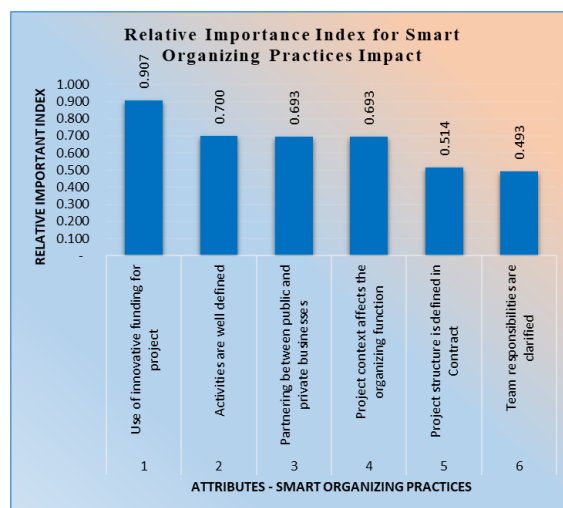


Figure 5. RII for Smart Organizing Practices Impact

Table 3. Impact Smart Organizing Practices

Rank	Attributes	Relative Importance Index (RII)
1	Use of innovative funding for project	0.907
2	Activities are well defined	0.700
3	Partnering between public and private businesses	0.693
4	Project context affects the organizing function	0.693
5	Project structure is defined in Contract	0.514
6	Team responsibilities are clarified	0.493

Table 4. Impact Smart Leading Practices

Rank	Attributes	Relative Importance Index (RII)
1	Change management practices are taken by the project leader	0.917
2	Training is provided for all project team members	0.538
3	Team members are well experienced in their position	0.500
4	Communication among all stakeholders	0.493
5	Appropriate project manager is assigned	0.272

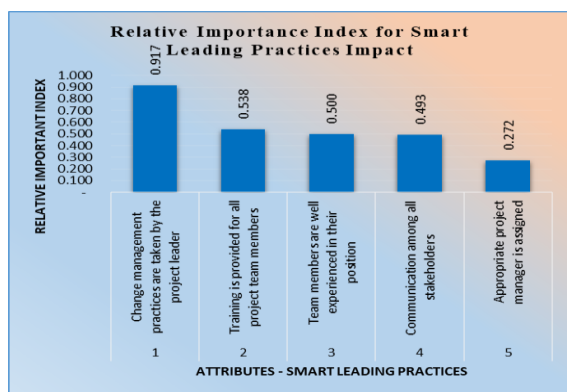


Figure 6. RII for Smart Leading Practices Impact

Table 5. Impact Smart Success Criteria

Rank	Attributes	Relative Importance Index (RII)
1	The project is completed with the planned time	0.914
2	The project delivered and meets all specification in the planning stage	0.724
3	The project is completed with the planned budget	0.710
4	The project result benefits all stakeholders	0.514
5	Project creates a positive impact on environment	0.300

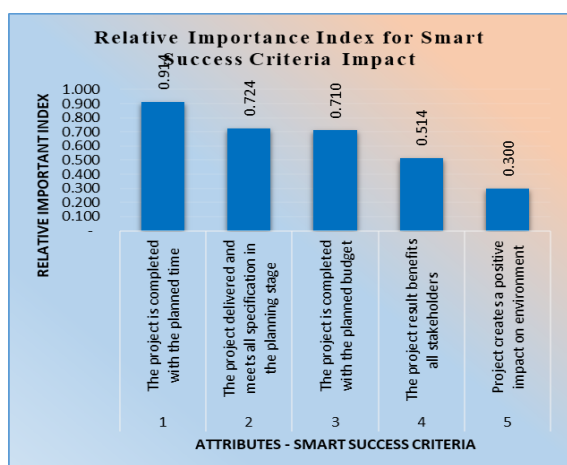


Figure 7. RII for Smart Success Criteria

Table 6. Impact in terms of Smart Planning Practices, Smart Organizing Practices, Smart Leading Practices, Smart Success Criteria

Rank	Attributes	Relative Importance Index (RII)
1	Project goals are made clear to all participants	0.924
2	Change management practices are taken by the project leader	0.917
3	The project is completed with the planned time	0.914
4	Use of innovative funding for project	0.907

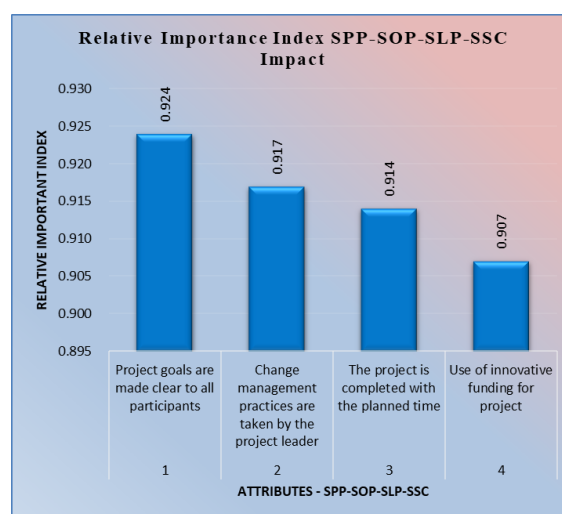


Figure 8. Impact in terms of Smart Planning Practices, Smart Organizing Practices, Smart Leading Practices, Smart Success Criteria

VI. CONCLUSION, RECOMMENDATIONS & FUTURE SCOPE OF WORK

Finally, based on the analysis, the proposed conceptual framework will be generalized in the Indian context setting out a holistic view of smart city projects management.

The study framework is a combination between the project management perspective and the smart city concept which provides a fresh view for smart city projects and defines new various factors that can potentially influence the success of smart city projects. Moreover, the study framework integrates the available knowledge on smart city projects and the research new findings which will provide guidance to organizations and professionals who work in smart city projects.

In expected outcome, Smart cities around the world need to develop new operating models that drive innovation and collaboration across the vertical silos. This study will contribute a small step to a deeper understanding of smart city projects management.

Particularly in recommendation the following Points can be taken by citizen to know the need of the smart city ABD provided under smart city initiative.

Table 7. Effect on Elements for Good Smart City Practices

Sr. No	Effect on Elements for Good Smart City Practices
1	Health Care
2	Energy
3	Water
4	Transport
5	Education
6	Public Safety
7	Infrastructure
8	Citizen Services

Further the scope for the future research study has been restricted to Pimpri Chinchwad. In future it can be extended to other cities of India also, because for this research it is restricted to Pimpri Chinchwad city. As PCMC city is in 2nd stage of Smart city Development Mission,

hence this research work will give detail information about Elements of Smart city Development and its services and implementation challenges. The outcome of this research will give current status of the smart city practices and its services; hence this research will help government to improve their services for betterment of the society which ultimately helps the Smart city Mission of the Government.

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