

Stakeholder Analysis For Smart City Development Project: An Extensive Literature Review

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Abstract. The current trend in urban planning has been evolved for developing the cities smart. Smart city concept directs urban development in to a strategic path to achieve sustainability in urban development. The understanding made up on the concept of smart city within any region would be fruitful to review in this nature. Similarly, the various stakeholders who would influence and contribute on smart city development projects are profound to identify in order to make the project success. As previous researches denoted, a timely and effective consultation of relevant stakeholders is of paramount importance for the success of any project. In line of thinking, this research was aimed to conduct a stakeholder analysis through a comprehensive literature review. Thirty one (31) key literature projects were obtained from recognised research databases and were critically reviewed to identify the internal and external project stakeholders of smart city development projects. As the key findings, the concept of smart city was first recognised. Secondly, academia and research institutions, local and regional administrations, financial suppliers/investors, energy suppliers, ICT sector representatives, citizens, government, property developers, non-profit organisations, planners, policy makers, experts and scientists, political institutions and media were identified as key internal and external stakeholders of a smart city development project. The key research findings were presented through a conceptual framework. The developed framework could be utilised as a basis to analyse the different influences and contributions of stakeholders of smart city development projects in any context.

1 Introduction

Cities nowadays face complex challenges in achieving goals regarding socio-economic development and quality of life [1]. [2] also stated that the increasing rate of urbanisation, urban areas face the challenges of achieving sustainable development within the cities. According to [3], sustainable urban development is seen as a solution to minimise the problems generated by widespread human activities on the environment. [1] mentioned that the smart city concept is an ideological solution to achieve sustainable urban development. Therefore, there is an emerging need to make a city smart to overcome the problems generated by the urban population growth and rapid urbanization [4]. Smart cities have gained an increasing importance in urban management and development [5].

In the drive to become smart, cities will have to face certain challenges [6]. According to [1] adopting stakeholders, acquiring resources, identifying priorities and creation of policies are the major challenges faced in the initiation of smart cities. Transformation from a non-smart city to a smart city entails the interaction of political and institutional components with technology as the smart city innovation, which states the importance of

stakeholder management in a smart city project [7]. Stakeholder engagement was identified as a core activity for creating project success [8]. Therefore, in this research paper, objectives were derived as (i) to identify the stakeholders of a smart city project and (ii) to analyse their engagement in different stages of smart city development. However, this is a part of a research in developing an approach for effective engagement of stakeholders for enabling smart cities.

2 Methodology

A comprehensive literature survey was carried out to identify the concept of smart cities, importance of stakeholder engagement for smart city development and to identify stakeholders to relate them with stages of smart city development. Thirty one (31) research projects in key literature were reviewed. Majority of the literature (78%) were obtained from journal publications. Twenty two percent (22%) of papers were reviewed from other sources including conference papers and websites. The journals are presented in Table 1.

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Table 1. Journals reviewed.

Criteria	Journal of Urban Technology	Cities	Journal of the Knowledge Economy	Journal of Environmental Planning and Management	Journal of Cultural Heritage Management and Sustainable Development	Business & Society	International Journal of Managing Projects in Business	Project Management Journal	IBM Journal of Research and Development	Procedia CIRP	Innovation: The European Journal of Social Science Research	Land Use Policy	Urban Studies	City	Asian Social Science	Construction management and economics	Procedia Manufacturing	ELK Asia Pacific Journals	Technological Forecasting and Social Change	Engineering Economics
Number of articles referred	4	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
% of Nos. of papers	78%																			

3 Literature Review

3.1 Concept of “Smart City”

‘Smart city’ concept has recently become an important term in discussions about cities and urban development models [9]. Smart cities are developed aiming towards environmental and social sustainability [10]. Number of definitions can be identified for smart cities. Urban planning field uses the term “smart city” as an ideological dimension according to which, being smarter entails strategic direction [11]. Smart city concept is a response to overcome the challenges in achieving sustainable development within cities [1].

Smart city concept is defined by [12] as, “a multidisciplinary concept that embodies not only its information technology infrastructure but also its capacity to manage the information and resources to improve the quality of lives of its people”. “Smart city implies a high-tech intensive and an advanced city that connects people, information and city elements using new technologies in order to create a sustainable, greener city, competitive and innovative commerce and a recuperating life quality with a straightforward administration and a good maintenance system” [13]. Furthermore, smart cities were identified as a result of creative strategies aiming at enhancing the socio-economic, ecological, logistic and competitive performance of cities through connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure [14-15].

3.2 Importance of Stakeholder Engagement for Initiation of Smart Cities

It is important to recognize the stakeholders in order to plan and execute a sufficiently rigorous stakeholder management process because project stakeholders affect project management processes [16]. Stakeholder management was identified as a core activity for creating project success [8]. Project stakeholder management includes stakeholder identification, classification, communication, engagement, empowerment, and risk control [17]. Stakeholder management was a concept derived from the resource-dependence view and the concept also addresses the risks and ethical issues as a core concern of stakeholder management of a project [18].

In the drive to become a smart city, challenges which arise could be problems associated with multiple diverse stakeholders, high levels of interdependence, competing values and social and political complexity [19]. Transformation from a non-smart city to a smart city entails the interaction of political and institutional components with technology as the smart city innovation which states the importance of stakeholder management in a smart city project [7]. Moreover to the author, the engagement of the stakeholders in each and every stage of sustainable smart city development can also be recognised. Stakeholder management is a key in initiating smart cities which is to create a sustainable and liveable city [20]. It is important to engage stakeholders ensuring that their activities meet the aims of the smart city project [21].

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3.3 Identification of stakeholders of a smart city development project

It is required to have a better understanding of the stakeholders who may contribute or influence over projects [22]. According to the author, stakeholder analysis helps to assist management in dealing with stakeholder demands and in increasing the contribution

from the stakeholders. Stakeholders of a smart city development project helps in achieving the goal of implementation of smart cities [23]. Therefore there is a growing concern on the identification of stakeholders of a smart city project to achieve the goal of success. Table 3 illustrates a review on the stakeholders of a smart city project in seven (7) key literature.

Table 2. Review on the stakeholders of a smart city project.

Stakeholders of smart city	Sources						
	1	2	3	4	5	6	7
Academia and Research Institutions	√	√				√	√
local and regional administrations	√			√		√	
Financial suppliers/Investors	√		√				√
Energy suppliers	√					√	
ICT sector representatives	√	√		√	√	√	√
Citizens	√	√	√	√	√	√	√
Government		√	√		√	√	
Property developers		√					
Non-profit organisations				√		√	√
Planners					√		
Policy makers		√	√		√	√	
Experts and scientists					√		
Political Institutions							√
Media		√			√	√	
Sources: 1. [20]; 2. [21]; 3. [23]; 4. [19]; 5. [24]; 6. [25]; 7. [26]							

3.4 Analysis of stakeholders of a smart city development project

3.4.1 Academia and Research Institutions

Academic institutions are contributing for the initiation of smart cities through academic research [20]. The growing interest of research institutes has led to a great number of pilot smart city initiation projects in recent years [25]. Therefore, these stakeholders are important in planning and developing strategies.

3.4.2 Local and regional administrations

It is important to have local and regional administrations to be actively involved in initiating, promoting and supporting smart city projects because smart city projects require improved public services [25]. Administration can contribute for smart city projects in managing the resources [19].

3.4.3 Financial suppliers/Investors

Smart cities are very expensive to implement and also to operate [23]. Therefore, a strong dependency on the financial suppliers can be identified. Obtaining funding is key for the development of Smart City Projects and the investors mainly consider the return on investment of the project [26].

3.4.3 Energy suppliers

In smart cities, sustainability is an important concern. Therefore, sustainable energy supply is required for the operation of the smart city [25]. Sustainable energy policy for smart cities plays a key role [20].

3.4.4 ICT sector representatives

In the initiation and the operational stage of smart cities, technological factors are identified as essential requirements [19]. ICT sector representatives are contributing for the development of a smart city [24].

3.4.5 Citizens

Citizens were identified as a main type of stakeholders [24]. Moreover to the authors, citizens as stakeholders are invited to experience urban space and report inefficiencies or place-based positive and negative views in initiating smart cities. It is a key role in urban planning. Citizens and their creativity, knowledge are important stakeholders in smart city initiation [23].

3.4.6 Government

Smart cities offer solutions for government in overcoming the challenges faced due to rapid urbanisation [21]. Government is responsible for knowledge creation and capitalization which is required for the initiation of the smart city concept [27].

3.4.7 Property developers

Smart cities are often driven by conflicting interests of property developers [21]. Property developers are interested in innovation and technological advancements in property development in smart cities.

3.4.8 Non-profit organisations

Social organisations and non-profit organisations are interested in the results which arise due to the implementation of smart cities [26]. Significant project-to-project learning processes in each stage of smart city is important for these stakeholders [25].

3.4.9 Planners

Sustainable urban development is currently considered as a key planning goal and has received much attention urban planners [24]. Smart city concept is a solution for achieving sustainable urban development. Therefore, urban planners are crucial in the initiation of smart cities.

3.4.10 Policy makers

Policy making and implementation is a key process leading to better transparency and accountability in a smart city [23]. In policy making, achieving sustainable urban development is a key goal and therefore, policy makers are more interested in making policies which leads a city to be smart [24].

3.4.11 Experts and scientists

Scientists and experts of the smart city concept are also required to be involved in the planning process of initiating smart cities [24]. Furthermore to the authors, scientists and experts are important for the innovation processes in a smart city.

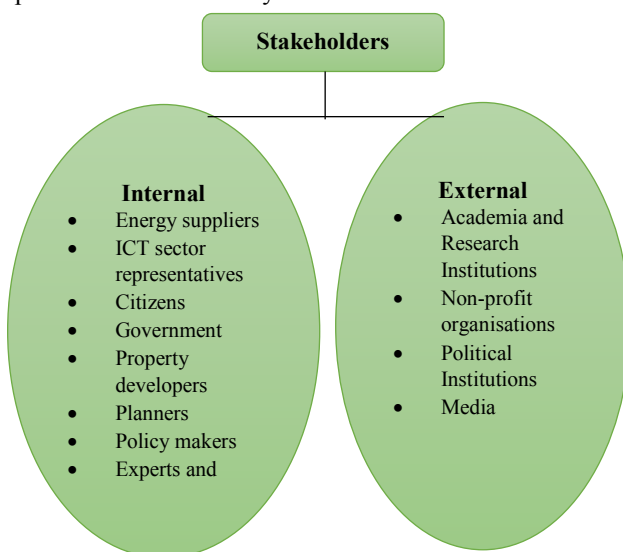


Fig. 1. Stakeholders of a smart city project

3.4.12 Political Institutions

The engagement of political institutions in transferability is key because sharing their experiences can be an asset for present and future smart city projects [26]. Moreover,

political institutions can impact on the governance of a smart city.

3.4.13 Media

Media can influence a smart city project through the coverage of problems and the advantages of a smart city [21]. The influence can be positive or negative.

Smart city is a multi-stakeholder ecosystem where stakeholder engagement is important for the success [7]. Stakeholders have a positive or negative impact to a project and can be classified as internal and external stakeholders. Internal stakeholders were identified as stakeholders who are interested in the financial activities and efficiency [28]. Moreover to the author, external stakeholders are interested in the value and quality. Internal stakeholders can be directly influence or be influenced by the project and external stakeholders can indirectly influence or be indirectly influenced. According to the findings presented above, the identified stakeholders of a smart city project were categorised as internal and external stakeholders. The findings are illustrated in Figure 1.

Planning, developing strategies, implementation of strategies and follow up were identified as steps in a smart city development project [29-30]. Kumar, Singh, Gupta, and Madaan stated planning, physical infrastructure development, ICT infrastructure development and deploying smart solutions as the steps in smart city development [31].

The identified stakeholders were connected according to their role which was analysed in the previous section, relating to the stages in the smart city project which they can influence or contribute. Accordingly, a conceptual model was developed and presented in Figure 2.

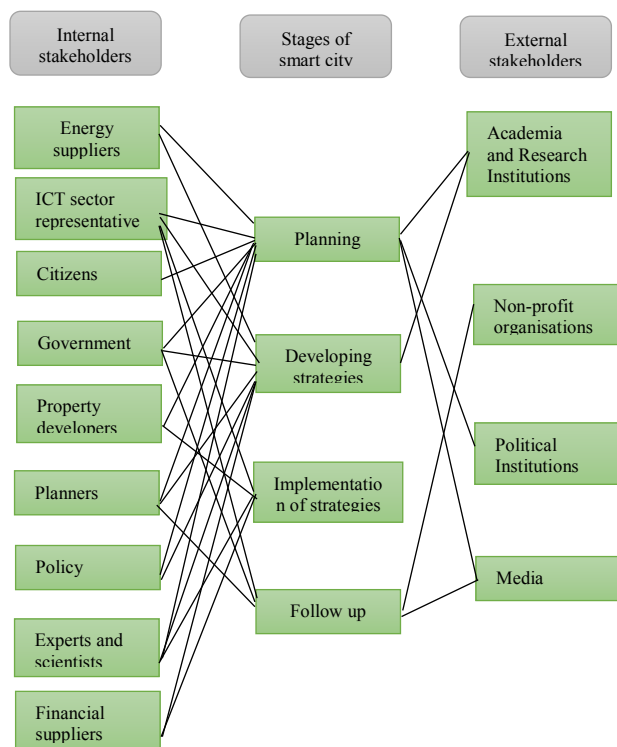


Fig. 2. Conceptual model

4 Conclusions

With the rapid urbanisation, cities are facing many challenges in achieving sustainability. These challenges lead the requirement of sustainable urban development within cities. In smart city development, stakeholders' engagement is considered as an important factor for the success of the project. The growing requirement of smart cities and the requirement of appropriate stakeholder engagement initiates the necessity of identifying the stakeholders and their role. Majority of the stakeholders were identified and categorised as internal and external stakeholders through the literature review. Based on the analysis, the conceptual framework was developed as the major deliverable where it can be used as the basis to enhance the stakeholder engagement in smart city development projects. Further, it would also be the first step in achieving the whole aim of the total study of developing an integrated approach for effective engagement of stakeholders for enabling smart city concept in Sri Lanka.

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