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Role of an Architect for Safety, Security and Privacy of Smart Cities

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***Abstract*:-- With the increasing population of urban areas, there are emerging trends and ideas for smart cities to respond the urgent need. It not only refers to the technical and technological advancement of the cities but it does refer to the planning aspects of the city which will help the citizens to have safe and secured built environment; retaining the privacy of spaces. These planning considerations will have great impact on human lives and their issues related to privacy and security. There is a conscious need to include privacy and security requirements into architectural Designs from the initial stage of design. The paper summarizes the major challenges and emerging issues to be watched out for the planning considerations of safe and secure built environment of smart cities. The key observation is that security and safety can be achieved: 1. By carving out interactive junctions to replace dark narrow spaces; 2. By imposing the spaces which can be directly viewed through the structures around (visual connectivity); 3. By integrating un-built spaces with the built spaces which will be used for different activities in different time slots of the day. In larger perspective this research proves to be fruitful for contribution towards smart city planning strategies which can be referred for designing safe and secured environment maintaining the privacy. This helps to nurture the sense of safety in built and un-built spaces of a smart city.**

***Index Terms*— Planning Strategies, Safety, Security, Smart Cities**

I. INTRODUCTION

The vision and concept of smart cities based on the related studies and development for several years with the focus on need of the people, place and time. The governing bodies and authorities are carrying out various researches to find out the solutions for present scenario of urban environment. There is need to formulate the planning considerations for smart cities that refers to the urban fabric transformation; making the cities more efficient and thereby making them safe and secure maintaining the privacy of people and place with reference to time. These planning considerations will be useful for the planners right from initial stage of planning and design decisions. It is observed that there is a focus on latest technologies to be used to make smart cities but these technologies and invented computerized systems will have an impact on human lives and might affect adversely on the safety and security of people living in and around a space. This paper summarizes the architectural design considerations for safety, security and privacy for smart cities which should be considered from the very beginning. The paper focuses on the issues to be watched out in the planning of smart cities.

II. SMART CITIES' SAFETY AND SECURITY

The technological advancements and computerized systems are becoming the major issues for maintaining the safety and security of a city. The increasing cases of cyber attacks and other incidents due to failure of system or technology are alarming. This clearly indicates the need of architectural intervention into this matter. The role of an architect in designing smart cities is vital. [1]The design of a smart city should be Interconnected, Instrumented and Intelligent.

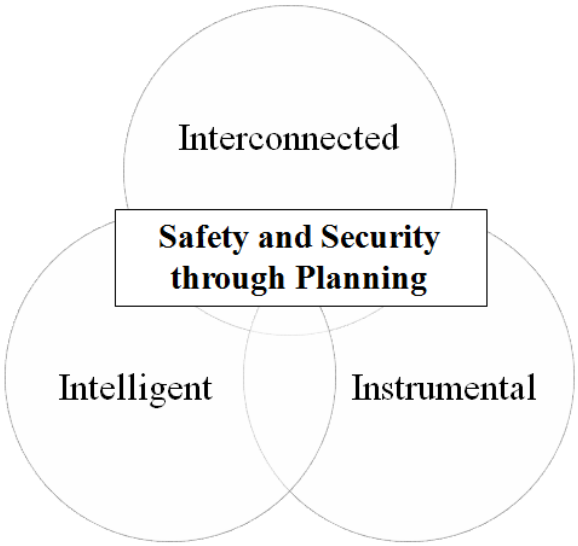

Fig. Planning Considerations for safety and security of smart cities (source: Author)

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The Instrumented design means a city should be covered by physically connected social spaces. The core of the space should have access to real-time and reliable socially active place and help desk. This relates directly to the safety and security of the people by the people to reduce and avoid crimes by the people in absence of the people. (Example: Nirbhaya Case, Delhi).

The Interconnected design means a set of nodes or junctions interconnected with each other either visually or physically or by both. These nodes and junctions include the various socially active places like urban plaza, parks, roadside sit-outs, cycling tracks, etc. The Intelligent design means an instrumented and interconnected urban environment that makes the best use of space fulfilling the safety and security of smart cities.

III. SMART CITIES' PRIVACY

The privacy is an another important aspect of a smart city which needs to be fulfilled in spite of creating the following three categories of spaces i.e. the spaces with visual connectivity and physical barrier, secondly the spaces with visual barrier and physical connectivity and the spaces with visual as well as physical connectivity. The integration of built and un-built spaces in a design is helpful to maintain the privacy. These three types of spaces should be designed by maintaining the hierarchy of an area and thereby considering the activities in and around the space.

These three types of spaces play an important role in shaping the urban fabric thereby creating the urban environment of smart cities. Such type of spaces encourage social interactions, social concern and yet maintain the privacy of each zone. Privacy has many configurations options, depending on expectations and preferences of residents of smart cities. In order to plan the city by maintaining privacy of people and place at different timeslots of the day the users should be approached before design decision. In this case it should be a participatory design i.e. designing for people by considering need of people. Government authorities must encourage the public participation for certain design decisions to make the design user centred i.e. keeping the user at the focus.

These strategies will help to reduce the dependency on technological systems and will thereby make the society interactive.

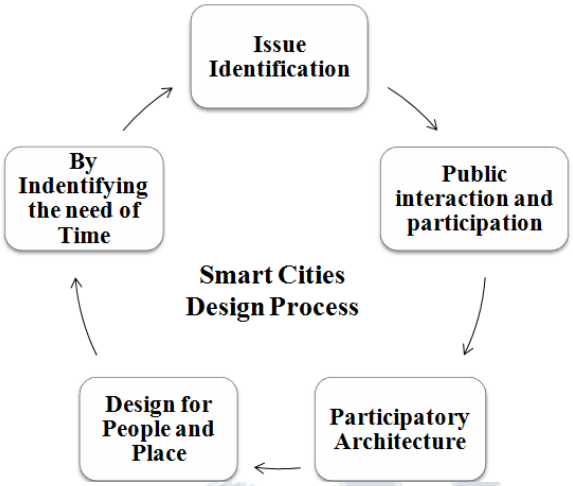

Fig. Smart City Design Process (role of architect) (Source: Author)

IV. SMART CITIES' ARCHITECTURE

The buildings can be an eye for security of the city and road networks of the city can be an eye for security of buildings. This again indicates to the interconnectivity, interdependence and visually and physically connected spaces. The clustering and design of building should be such that it creates safe and secured urban environment around maintaining the privacy of spaces. Too much of connectivity may also lead to troubles therefore maintaining the hierarchy of spaces with proper integration un-built spaces and their connectivity through socially active spaces should be considered properly. This is possible only with the help of public participation in the architectural design decisions.

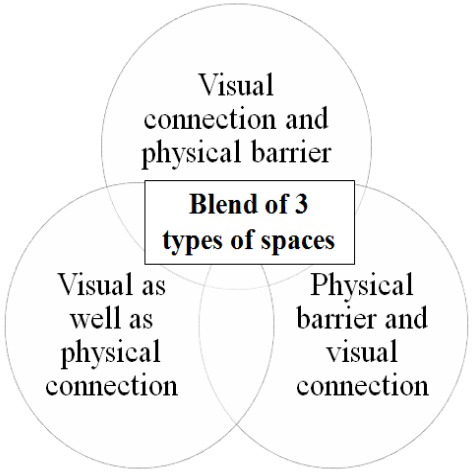

Fig: 3 types of spaces to be designed (source: Author)

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V. INTELLIGENT ARCHITECTURE

With the increasing population of urban areas, there are emerging trends and ideas for smart cities to respond the urgent need. It not only refers to the technical and technological advancement of the cities but it does refer to the planning aspects of the city which will help the citizens to have safe and secured built environment; retaining the privacy of spaces. These planning considerations will have great impact on human lives and their issues related to privacy and security. There is a conscious need to include privacy and security requirements into architectural Designs from the initial stage of design. The paper summarizes the major challenges and emerging issues to be watched out for the planning considerations of safe and secure built environment of smart cities.

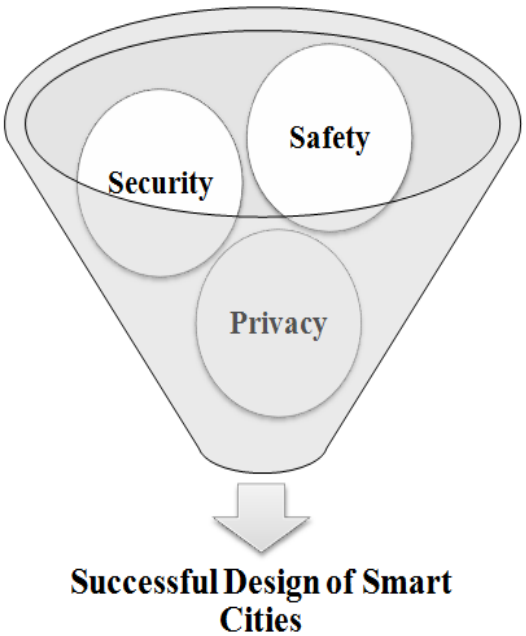

Fig. Achieving intelligent design of Smart Cities (source: Author)

Therefore the intelligent architecture may be developed. The buildings can generate electricity to remove dark areas in and around the building thereby creating a sense of safety and security within the users of the building. Such features can be added to buildings of different typologies and different zones for example academic zone, commercial zone, etc.

VI. CONCLUSION

The paper concludes that the role of an architect in designing safe and secure smart cities by maintaining privacy is very important. The key recommendations are that security and safety can be achieved: 1. By carving out interactive junctions to replace dark narrow spaces; 2. By imposing the spaces which can be directly viewed through the structures around (visual connectivity); 3. By integrating un-built spaces with the built spaces which will be used for different activities in different time slots of the day; 4. By integrating spaces of social cause in every part of the city; 5. By using interconnected social gathering spaces to create sense of security within the users. In larger perspective this research proves to be fruitful for contribution towards smart city planning strategies which can be referred for designing safe and secured environment maintaining the privacy. This helps to nurture the sense of safety in built and un-built spaces of a smart city.

REFERENCES

1. Felipe Silva Ferraz ,Carlos Candido Barros Sampaio, Carlos André Guimarães Ferraz (2015), “Towards A Smart-City Security Architecture Proposal and Analysis of Impact of Major Smart-City Security Issues”, Informatics Center Federal University of Pernambuco Recife, Brazil

2. R. Barker, “Security aspects in 6lowpan networks,” in Design, Automation Test in Europe Conference Exhibition (DATE), 2010, 2010, p. 660.

3. S. Dirks and M. Keeling, “A vision of smarter cities: How cities can lead the way into a prosperous and sustainable future,” IBM Inst. Bus. Value. June, 2009

4. C. G. Kirwan, “Urban Media : A Design Process for the Development of Sustainable Applications for Ubiquitous Computing for Livable Cities,” pp. 7–10

5. Y. Wang and Y. Zhou, “Cloud architecture based on Near Field Communication in the smart city,” in 2012 7th International Conference on Computer Science & Education (ICCSE), 2012, no. Iccse, pp. 231–234.