Smart City and Citizen Perception in Oman

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Abstract- In this paper, we will highlight the smart city, concept and its divisions along with the citizen perception including difficulties and the solutions through which we will come out with a range of necessary facts to understand the future of the city. This research paper focuses on the Sultanate of Oman with the aim to establish a smart city by examining the potential threats and by implementing possible solutions. We are confident that; this this would be an ideal approach to come-up with smart city in Oman followed by smart Sultanate of Oman.
Keywords – Smart city, Concept, Citizen Perception, Challenges, Solutions.

I. INTRODUCTION

The concept of smart city is becoming very popular now days even though applicability still in its new shape. Since it is not related to a certain standard, the definition of Smart City has been established based on theories and research as well as pilot projects. There are many definitions proposed by the researchers for the Smart City. However, we can define it as the urban city in which people live and we can summarize these works by citing examples such as: social work, educational work, government work, etc. [1] Although people are very interested in modern technology and move forward with it, it is clear that there is some brain of which inhabits the hearts of the people. So we conduct research and develop evidence that may limit these concerns. Further, the Smart City concept integrates ICT (information and communication technology) with a range of network-connected devices to improve the efficiency of city-to-citizen services. Smart City's technology gives administrators the ability to communicate and interact directly with the city's infrastructure, as well as monitor what happens and how it evolves [3].

The main objective of the use of ICT is to enhance the quality of performance of urban services, with the aim of reducing the initiation of national resources and increasing communication between government and citizens [5]. Many applications have been developed for smart cities and are highly prepared to respond to citizen requirements at present. Hence, smart city is still able to terminate transactions for citizens quickly and easily. Similarly, smart city has other terms such as digital city, e-communities, e-government, information city, knowledge city, wire city and so on. Furthermore, there are some modern technologies that have opened up many services, including cloud-based services, Internet stuff, and smart devices such as mobile phones, sensors and smart meters [10].This itself opens a new horizon in solving some problems and open the door of cooperation between different people to reach the best solution.

The online collaborative sensor data management platforms is a service that gives a large database where smartphones can register and join them, communicate with each other, broadcast their problems and listen to available solutions [11]. This gives users an opportunity to participate in different applications and give them space in the same database to build their own applications based on that data. However, one of the smartest applications of smart cities is the electronic card, also called the smart card. Each person has this card with an encrypted number for which no one has automatic access. Here, the citizen can perform his national duties by paying the balances using them. This process itself requires only a few seconds. Thus, the process became easier for parties, the government and the citizen. And with this research we tried to dig-down the pros and cons of smart city and perception of smart city among Omani citizen.

II. BACKGROUND

The smart city is defined as the city that uses ICT to meet the requirements of the citizen. The key to the difference in the smart city is the citizen's participation in all the operations that take place within his smart city is a key part of it. Through the dissemination of Information and communication technology throughout the region, but applies this technique intelligently affects positively on the community [1]. The results of the study showed that there are many objectives for which the term smart city was created. The most important ones are those that serve the environment and reduce pollution. Such as improving the process of sewage and waste disposal. Also, the most important examples are the use of sensors to measure standards Water and drinking water quality. The establishment of such systems greatly reduces the damage caused by the infrastructure of any area and increases the economy. [2].

One of the main destinations of the Smart City is sustainability. It is noted that 80% of people live now in urban areas compared to 60% only 50 years ago. Therefore, there is a confirmation and proof that the smart city will maintain the well-being and urbanity of cities. Thus increasing the efficiency of Governments and the services

provided in the coming years in all urban areas. [3]. The researcher says we all have water meters in our homes, did we think it is part of the smart city? , The calculations of water and electricity meters located in the walls of our homes have a significant role in raising the efficiency of services. It also helped to accomplish this task easily for both the citizen and the government, especially during the payment of bills. What about the free or available Wi-Fi in parks, malls and airports?, is also a smart city that includes convenient and urban services. [4].

The researcher says the city's smart initiatives should include people who aim at them all. The city's leaders are not only aware of the advantages of the Smart City, but also promote and encourage the use of open data that opens a bridge between them and the population. If the population has knowledge of what they will participate in, and the resulting benefits, it is to be shared. One of the most important things that still worries public opinion in the Smart City is the preservation of data. The privacy of the data and the privacy of its use still worries many people. [5]. Some people, especially older citizens believe that the presence of sensors and surveillance cameras as a violation Privacy or electronic control. They also say that all the information stored in smartphones is at risk of theft and piracy. The information gathered for the smart city should therefore be anonymous and not personally identifiable. [5].

The Smart City initiative includes various services. One of the most important is the smart street lamps that operate on their own. The availability of the free public Wi-Fi network is also one of the smart features of the city. The smart Government is also seeking to create electronic parking spaces that are easy for the driver to access. Solar fuel stations can also be provided to enable the use of solar powered vehicles. The presence of cameras helps to reduce accidents and crimes. [6]. The researcher says that the exposure of coastal cities to successive floods in previous years can be taken as a turning point positive, by the development of intelligent devices with high sensing and the ability to predict the weather conditions that may occur. He added that the idea of smart city came after researchers realized that the main goal of the advancement of technology is the comfort of the citizen in a city so everyone seeks to harness technology to serve it. Another example is the study of soil fertility and moisture and its ability to create high quality crops. Here we can plant sensor sensors with environmental standards for soil efficiency. It was implemented in Chicago, which included 14 teams from different companies and universities, which gave positive results clearly. [7].

The smart city is still in rapid evolution, as it encompasses both the dimensions of human intelligence and collective intelligence and artificial intelligence within the city. The intelligence of cities lies in the combination of digital communication networks and the intelligence of human minds as well as sensors and various software. They are an integrated communications platform and a dynamic visual network.[8].This is in itself making the relationship between the government and the citizen a document of mutual trust.

III. METHODOLOGY

In this paper, we used the questionnaire to collect primary data, which we published for the citizens of Oman. After collecting the data we analyzed the results and extracted the graphs from them. As preliminary method; we prepared extensive version of survey questionnaire which includes history, concept, and establishment strategy, effect (both positive and negative) of smart city. Perhaps; we utilized money survey as our survey assistance. Within a short period of time we received huge number of detail feedback from the community which was beyond our expectation. Each and every single concern from user we taken into account very sincerely; and we analyze various ways to find the fact(s).

Further, to visualize all the feedback we applied basic visualization tools (MS XL). Using XL-visualization technique we produce very simple and handy reports which are moderately elaborated in the next section named "experiment and analysis".

IV. EXPERIMENT AND RESULT

The Smart Cities concept has been one of the most important technological concepts in the world in recent years, but it was delayed in reaching Oman until the state began implementing its plan to launch a new generation of cities. Smart cities have access to infrastructure capable of absorbing all utilities such as water, electricity, gas, communications, the Internet and other life requirements. They are controlled automatically by sophisticated technological systems and an information infrastructure that enables residents of these cities to control all the devices in the home remotely. For other factors including automatic traffic control, crime prevention through monitoring devices based on the information infrastructure, and monitors all movements that take place within the city, in addition to providing elements of safety against fire and road accidents and others.

By analyzing the results of our questionnaire, 88% of people said that the presence of a smart city in Oman will positively affect their lives. As a result of a link between systems. We also asked a question about the purpose of establishing a smart city. The result was that 56% of the responses indicated that the main objective of establishing a

smart city is to facilitate the life of the citizen. 64% of the respondents believe that Dubai is the best example of a smart city to date, although the reality does not show that Dubai is a fully smart city but it has multiple smart applications. The world is 65% of the telecommunications infrastructure.
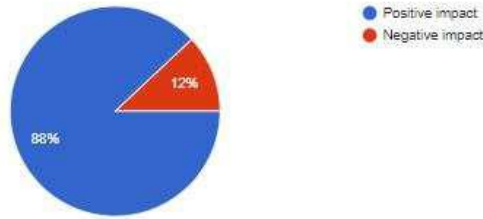

Figure 1: Impact of having smart city in Oman

Further, 56% of the respondents believe that there is no plan to establish a smart city in Oman, and we can analyze this by saying that if their belief is true we should show them the plan approved by the government The Sultanate of Oman has taken a major step towards the establishment of the first smart industrial city by signing an agreement with South Korea to implement the huge project in the special economic zone in the port of Duqm. My Sun Byung Suk, involves performing a comprehensive study on the projects and areas of investment in the smart cities sector. Oman is on track to implement an integrated electronic transformation plan that expires by 2020, defying the difficult circumstances that have affected the country's financial balances due to the decline in oil prices four years ago. The project, along the arid coast 550 km south of Muscat, is the largest in the history of the Gulf state. It comes as part of efforts to stop reliance on crude oil and gas exports and diversify sources of income.

If their belief is wrong (and this is the reality), the relevant authorities in this field should raise knowledge in this area by educating people and educating them about what is a smart city and its components and derivatives and the plan that the country is going to create its own smart city.

The results show that 52% of the respondents indicate that Japan ranks first in the world in terms of having an integrated smart city.
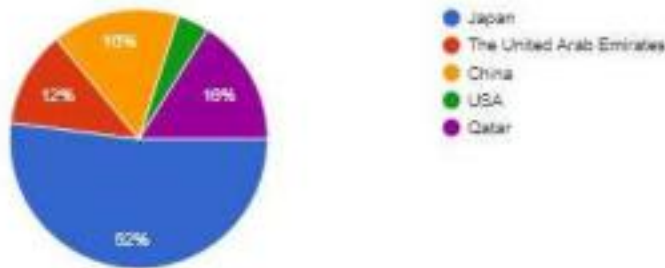

Figure 2: Best example of smart city in the world

The best example of a smart city in Japan is Fujisawa, a modern city supervised by the construction of a Panasonic factory on one of its old factory sites, and about an hour from Tokyo, Japan. The ecological emission of ordinary fuel-powered vehicles, therefore, built power stations in all corners of the city. The following table compares intelligent transport system applications in the smart city of Fujisawa and Muscat in Oman.

Table1: comparison intelligent transport system applications in the smart city of Fujisawa and Muscat in Oman . (Researchers works)

Intelligent transport system applications	Fujisawa	Muscat
Traffic management	☐	☐
Transportation Demand Management	☐	☐
Electronic collection of fees	☐	☐
Parking management	☐	☐
Enhanced traffic safety (emergency vehicle management)	☐	☐
Automated safety	☐	☐

inspection (vehicle weight measurement)		
Provide weather information	☐	☐
Highway Control	☐	☐
Automatic road closure	☐	☐

The responses to the questionnaire showed that a set of challenges for building a smart city in Oman came first with 44% the city's old infrastructure, followed by 40% of limited city budgets. The following figure illustrates the challenges better.
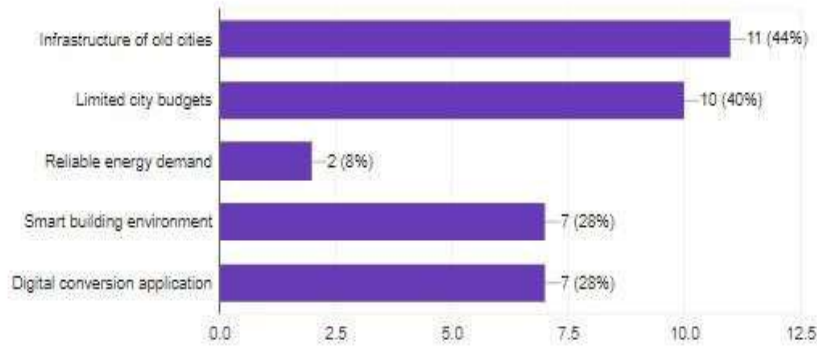

Figure 3: Challenges facing the establishment of a smart city in the Sultanate of Oman

Further, we then asked users about the proposed solutions that in turn will reduce the challenges facing the Smart City of Oman. The results showed that the best solution is to draw up a plan to build a smart city by 64%.
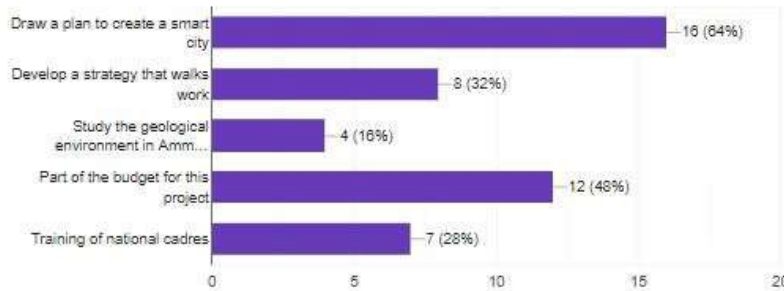

Figure 4: solutions that will reduce the impact of the challenges

V. CONCLUSION

According to a study by the McKinsey Global Institute, the world's 600 most rapidly growing cities will generate around 60% of global economic growth between 2010 and 2025. To ensure that this level of growth is maintained and maintained, cities must prepare themselves for the problems of urban population growth and climate change by finding ways to better manage resources and infrastructure. Many countries believe that the initiatives and projects implemented within the concept of smart cities are the solution to these problems, which will ensure their growth, the optimal utilization of their resources and infrastructure, solve many problems and provide a better life for citizens and visitors, which will in turn affect all aspects of society.

The infrastructure of the Sultanate of Oman can be developed to cover all the challenges we have mentioned. Building a smart city is not difficult when infrastructure and human resources are available. The union of these two things will lead to the emergence of a giant smart city. Researchers and media have shown that the Duqm area will be transformed into a smart city with a large economic character over the next 10 years. The world will turn into a small village that will make it easier for people to live easily and easily, where they can reach what they want in a fraction of a second.

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