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To cite this article: Nada Khaleefah Mohammed Ali Al-Rikabi 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **518** 022069

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The Social Dimension and Its Role in the Applicability of Smart Cities in Iraq

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Abstract: Smart cities are using innovative technological solutions to improve the quality of life and service that citizens and visitors receive. Defined as a digital or ecological city, its services depend on information and communication technology infrastructure, such as intelligent automated traffic systems, advanced security management Services, building systems, and the use of automation in offices and homes. The global trend now towards smart cities, sustainable and green cities and other cities, with different nomenclature, the common denominator is the comfort of the individual and the preservation of natural resources. Adopting smart, sustainable, green, or healthy cities is either to address a problem or to ward off the risk or both, as the need to go to green cities was to avoid the problems of environmental pollution and resource depletion, while the health cities were intended to achieve health well-being and for resource sustainability. The importance of this research has been highlighted by the experiences of different countries that tried to implement the principles of smart cities, including those who succeeded and achieved impressive results, and other cities whom still tries to overcome the disadvantages of these cities.

It was noted that the difference between most experiments was according to the quality of the society in which they were applied, as the research aims to demonstrate the role of the social dimension in the mechanism of implementing smart cities, and if this role is negative or positive, the research hypothesis states that the social dimension of individual behavior plays an important role in determining the possible To embrace the concept of smart city, the research structure includes a theoretical aspect that highlights the smart cities , their indicators , principles and the applied side of the social dimension with its indicators, we made questionnaires through the identification of selected experts of planning, architecture and environment, then concluded to a set of conclusions identified The importance of the social dimension and its(negative , positive) effects in the achievement of smart cities, finally we put number of recommendations that will help to solve the problem and achieve the objective and hypothesis of the research.

1. Introduction

There is more than one definition of the term and sometimes more than a label, such as "digital cities " and "Eco cities ", different from the objectives set by those responsible for its development.

In general, "smart cities" foresees the future at the economic and social levels, the aim of which is to provide an environmentally friendly digital environment and a catalyst for learning and creativity that contribute to the creation of a sustainable environment that promotes a sense of happiness and health.

The report revealed Seventy percent of the world's population will be living in urban areas by 2050, according to a recent report by the United Nations. There are high expectations that the GCC countries would capture one of the highest rates of urban population in the world by 80 percent to 100 percent. [1]



The research provided the necessary guidance to all stakeholders in the ecosystem of smart cities, highlighted the benefits and the most important pillars of information and communication technology in smart towns, and highlighted the importance of ICT innovation.

1.1 Smart cities principles and structure

The smart cities are helping to build and implement operational competencies to provide services to citizens and businesses, including ensuring efficient traffic management during traffic safety times or e-services to obtain business approvals and permits, which contributes to building an environment – finding An environment that attracts business and keeps economic growth» Urban and Traders ' statistics are effective in attracting foreign direct investment and supporting innovation; providing a safe environment and effective energy for citizens through the implementation of solutions such as television circles»[2]

Closed, smart counters, building management systems and smart lighting to better monitor citizens ' behaviors and promote energy efficiency; support growth, innovation and acceleration and reliability» E. Some cities can choose from the use of robots (Android) to provide monitoring services in B Bite pre-defined areas. Technology building smart cities based on IDC smart data documents or allowing cities or businesses to use citizen data to develop innovative new services or applications; ensure high levels of citizen participation and provide a better quality of life, as smart cities» will enable citizens to provide ministers, feedback and communicate with the authorities directly. Smart cities will consist of initiatives such as Internet services, mobile devices, smart traffic, intelligent lighting, smart health care, smart counters, smart grids, and security systems to create a system that ensures a strong sustainable environment for its citizens. [3]

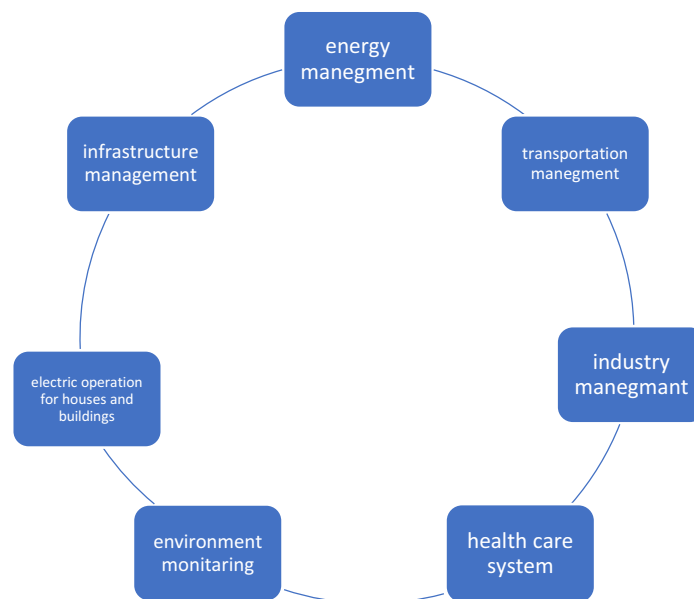


Figure 1. Smart cities structure\ Reference: [<https://www.emc.com/leadership/digital-universe/2014iview/executive-summary.htm>]

The Smart cities diminutions are: economic dimension, social dimension, institutional dimension and infrastructure management

- The economic dimension: includes all eco-friendly economic activities that conserve natural resources, reduce pollution rates and, more importantly, provide employment opportunities for young people.
- The social dimension: includes the people who will live in the smart city and their activities and behavior. So, a smart society that is easily adapted to change can be a very suitable community for living in smart cities, where the behavior of the individual is very important in the implementation of the smart concept
- The infrastructure: we mean by all the services and the infrastructure that must fit the concept of smart cities
- The institutional dimension we mean by urban governance and its laws governing the city.

Which should be strong and smart and easy to implement [4]

The research will focus on the *societal dimension* in the smart cities and will spot light on the role of social on achieving progress or not in to smartness.

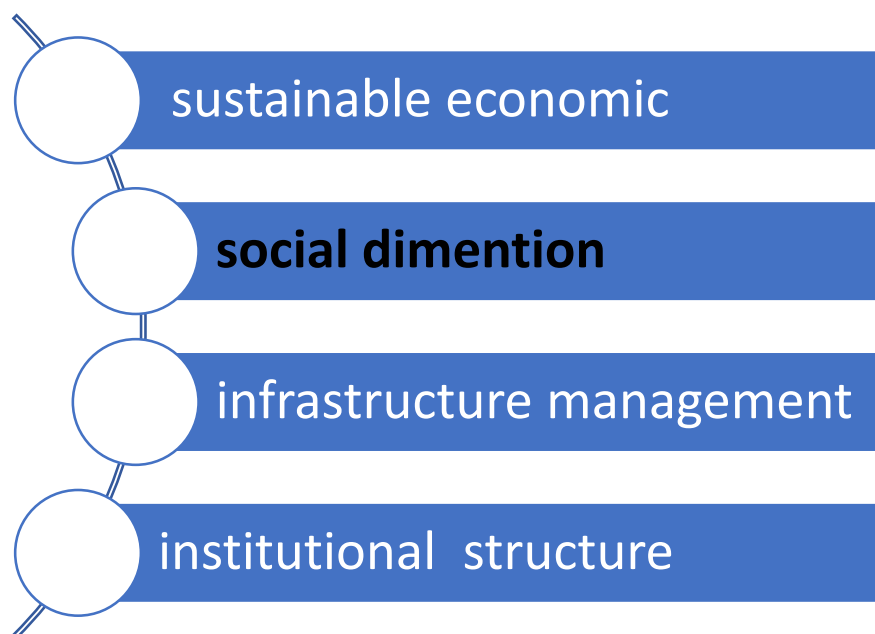


Figure 2. Smart cities dimension\Reference: the researcher

1.2 Smart city indicators

- Smart community: The potential of information technology (IT applications), and the possibility of changing from a natural society using technology to an innovative society capable of reaching innovative solutions to its current problems and future development.

An individual in a smart city can do most of his activities through his home. In other words, he can handle everything that starts with an e-government such as, e-mail, e-cards, e-books, e-commerce, e-shopping [5]

- Smart activities: includes a range of services and activities that contribute to the provision of quality of life, cultural, educational and tourist activities, emphasizing the quality of the health system, and quality building services.

- Intelligent transportation: Any management of the transport system and traffic through a range of IT-based technologies ensures easy and fast access to and from services. Where sustainable transport is a key focus of intelligent transport

- Renewable energy: Smart cities are characterized using energy, water, sanitation and solid waste, transforming them into environmentally sustainable elements and the use of information technology for their sustainability.

As well as the use of solar, wind, geothermal and hydropower energy, increasing its utilization at the city level, as well as developing ways to reduce energy consumption at the level of the building or lighting roads and streets within the solar photovoltaic city. [6]

- Water and sanitation: Reducing energy consumption was not only a sustainable component of the city but also a reduction in water consumption and recycling. IT has produced many applications that have contributed to the conservation of natural water resources to ensure their sustainability.

- Green transportation: such as walking, using clean electric or solar transport, while minimizing traditional transport. In case of unavailability, the Green City reduces emissions resulting in rational use by investing in public transport and minimize the use of private transport.

- Intelligent economy: approaches to dealing with activities such as e-commerce, e-tourism and e-services. It refers to a new global economic architecture dominated by information services in commodity production in job creation. Characterized using information and communication technology, in general. [7]

2. The case study

It was focused on the indicators we discussed above to demonstrate the impact of society on the applicability of smart cities in Iraq. We chose a group of experts to answer the survey questionnaire of 30 experts in the field of sustainability, architecture, planning and environment.

1. Infrastructure: 75% of the answers to the infrastructure (sustainable infrastructure that does not allow for excesses and minimal loss ratios) can contribute to (the resilience of society faster) with the idea of smart cities while the traditional infrastructures will work on (not adapting the society) with the idea of research especially that have bad experiences with the reality of the bad Infrastructure, see figure 3.

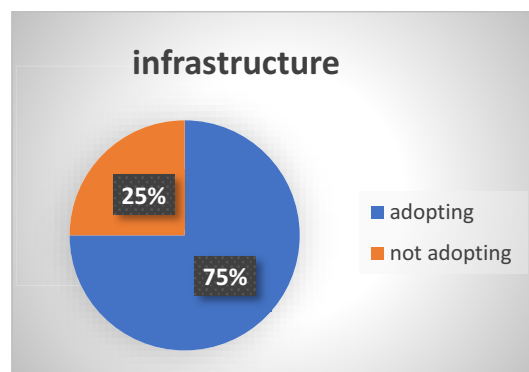


Figure 3. Infrastructure

2. E-government: The answers were as follows:

70% of the answers are contribute fast while 20% contribute slowly, the difference between the answers is related to the diversity of the Society based on the education background, see figure 4.

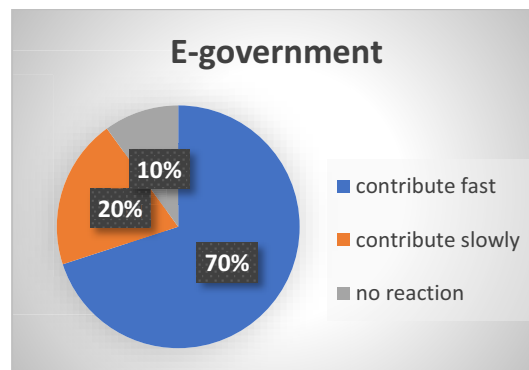


Figure 4. E-government

3. Economic activities: the question is (describe the ability of economic activity in the smart cities) the answers were: 40% slow adopting while 20% of the answers are (not adopting) and 40% adaptive the smart active depends on the group young people who can work according to the information technology machinery who (they do not represent most of the population) and that was the reason for the low contribution ratios as shown in figure 5.

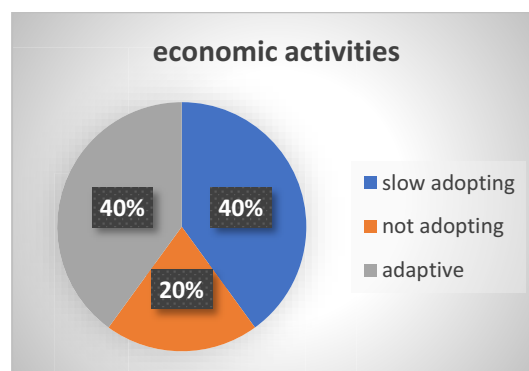


Figure 5. the economic activities

4. Social activities (when we ask about the impact of smartness on the society) the answers were: 80% not adapting. The reason is that Iraqi society is interdependent and cohesive and governed by social ties, despite the development of technology and social media programs, the society still sticking to its customs and traditions social communication, while the answers on (the smartness will help the society in Iraq to improve) take 10% of the total answers and 10% choose (the social activities will never effect by smartness), see figure 6.

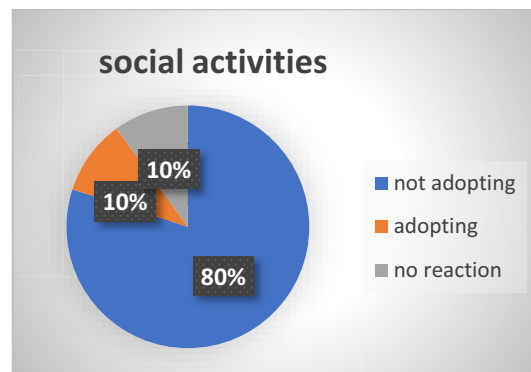


Figure 6. Social activities

5. Recreational Services: about the recreational activities 50% of the answers are quick adopting, when 40% are slow adopting

The varies in the answers due to the nature of the Iraqi city's population pyramid (children, women, and the elderly) those categories interested to recreation more, see figure7.

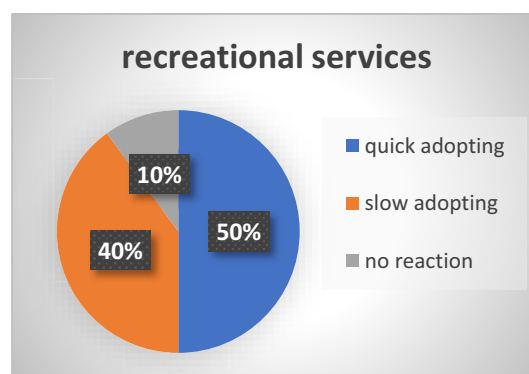


Figure 7. Recreational services

6. Administrative services: when we asked the questionnaires about (the role of smartness on administrative services) the answers were 90% quickly adopted (the reason is that the community finds it better to complete its administrative transactions in a confidential manner to save time and effort especially as it is a method that currently followed in some region 10% answered it will not adapted, see figure 8.

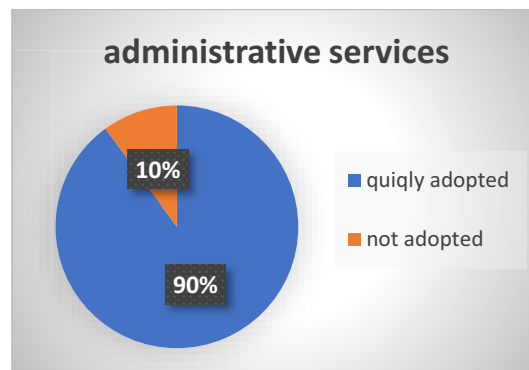


Figure 8. Administrative services

7. Health Services: when we ask about how are the relation between the smartness and health services they answered (slow adoption) with percentage of 64% and 30% of the answers were (not adaption) while 6% of the answers were (quick adaptation).

Different answers were due to the difficulty acceptance of community to electronically services and the other reason is the large spread of private clinics in all the Iraqi cities, See figure 9.

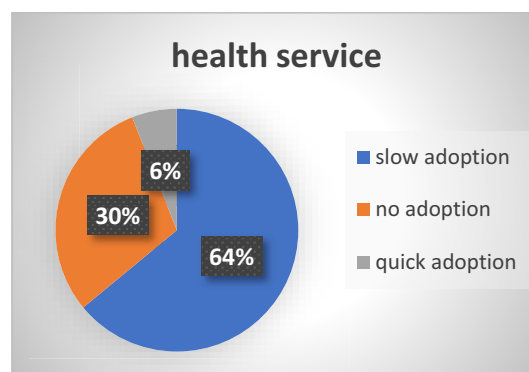


Figure 9. Health service

8. Educational Services: in the educational sector we can tell that the smartness has a big role in our society, 89% of the answers were (quick adaptation) when 10 % of the answers were (slow adaptation)

The high and excellent percentage because of the experiences of some Iraqi universities in the field of e-government and distance education, see figure 10.

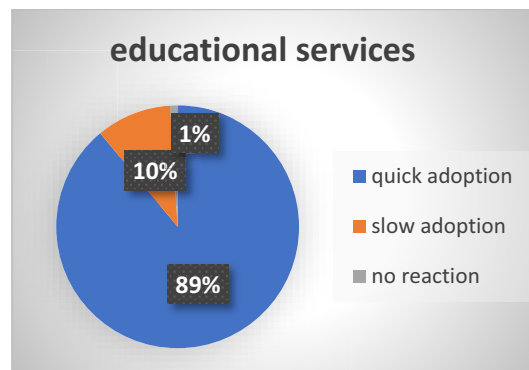


Figure 10. Educational services

9. Renewable energy: when we ask about the application of renewable energy in the smart city the answers were 35% (fast adaption), 55% No adaption and 15% slow adaption.

bad energy services and weak conventional networks in Iraq, the lack of clear and serious steps in the field of renewable energies in addition to its big problems makes the verities in the answers, see figure 11.

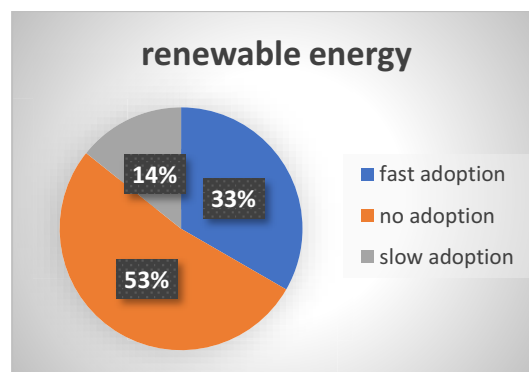


Figure 11. Renewable energy

10. Water supply and sanitation: as we can see the answers 73% for rapid adaptation and 20% for slow adoption

Most of the residence are suffering from the daily water share due to the poor quantity and bad quality of water for the dwelling unit, where the per capita share is less than half of its assessed, due to losses and seepage in the network, thus the society is adapting to the rational consumption significantly

As for sanitation, the adaptations reached 89% of the community's need for this service and significantly while the 11% of them they are not adopting because they already have sanitation services, see figure 12.

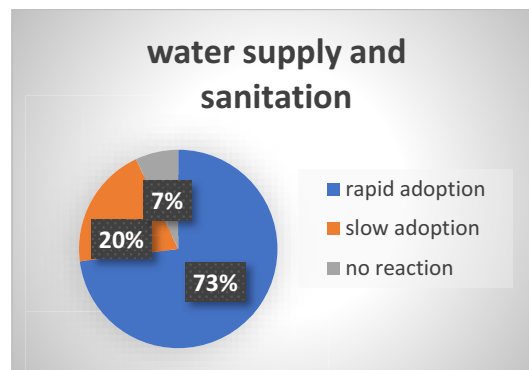


Figure 12. Water supply and sanitation

11. Transportation: due to the transportation problems in Iraq we find that 52% of the questioners were highly adaptive when 40% were slowly adapting.

This variation in the answers because of the society awareness toward the transportation problems which were complex and difficult to be solved, thus the person find that the work from home is saving time and money as well as it better than go out in bad transportation and infrastructure systems, see figure 13.

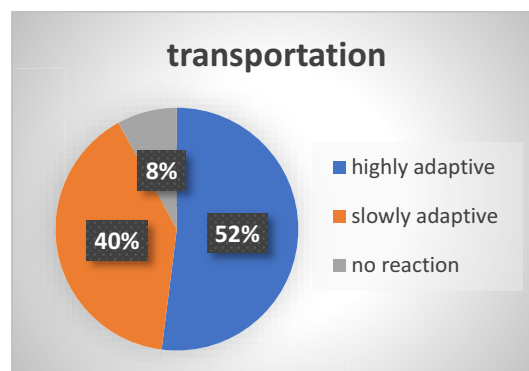


Figure 13. Transportation

12. Green economy: for that concept the answers are 90% who chose highly adaptive and 10% choose poor adaptive, that highly adaptive because most of the tourism, foreign transport, import and export activities are now done electronically, see figure 14.

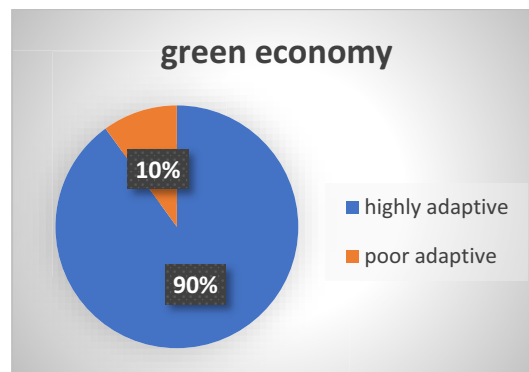


Figure 14. Green economy

3. Conclusions

1. The social dimension is important in the implementation of smart cities because it is one of the most important pillars
2. The applications of smart cities around the world vary according to their societal fabric, services and energy used
3. Iraqi society is civilized enough to activate the idea of Smart City
4. The study showed that the Iraqi society is highly adaptable and clear with indicators (e-government, educational services, recreational, management, water and sanitation, transport and green economy) which indicates the need of society and its awareness and perception
5. The survey showed a weak and unclear adaptation of indicators (renewable energy, health services and economic activities) and the reason is the reality of these services and the difficulty of implementing them intelligently now
6. Iraqi society is characterized by an interconnected fabric which is why it does not adapt to the idea of a smart city clearly in the indicator (social activities)

4. Recommendation

1. In order to solve the problems of public transport and traffic congestion must adopt a sustainable transport system and establish a new and fast road network in addition to build ring road around the cities to avoid through traffic
2. Increasing population densities with the provision of basic services
3. Conduct accurate population studies to solve the problems of urban services
4. Application of the idea Smart government widely to include all Iraqi cities
5. Creating employment opportunities for youth based on information Technology
6. More use of renewable energies to avoid pollution problems
7. Sustainable water resources, rationalization of their consumption and work for sewage recycling

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