Smart Cities and Their Impact on Human Civilization Behavior "Abu Dhabi City Model"

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Abstract: The aim of this study is to identify the smart cities and their impact on the development of investments and solving the problems that Abu Dhabi city suffers from. The study used both the descriptive method and questionnaire to collect data. The sample consisted of 2075 individuals working in investment and economic, public services, social, health and education sectors in the city mentioned. The results showed that the significance of applying smart cities in the fields of investments and reducing the problem of transportation and roads in the city was high and a high level of satisfaction with smart cities, serving the citizens and the city as well. The results also showed that there were statistically significant differences in the significance of applying smart cities in the field of investments according to the gender variable in favor of females and other ones in reducing the problem of transportation and roads in favor of educational sectors. The study recommended creating simulation models for teaching individuals how to deal with smart cities and to get benefit from.

Key words: Smart city, civilization behavior, development, variable, satisfaction, educational sectors

INTRODUCTION

Smart cities is undoubtedly the most interesting issue recently, especially after the announcement of Dubai's hosting of Expo 2020. The word "smart" in itself is perhaps more neutral than other terms that are sometimes controversial such as "green", making it more attracting to a wider audience, it is not desirable to be "intelligent"?! It is not only an attractive term for marketers, it is one of the most important new criteria for evaluating urban space planning (Cowman, 2014).

The revolution of contemporary technologies and their impact and rapid growth and widespread parallel to all previous scientific revolutions in the era of humanity The emergence of this development in the introduction of information technology in the mid-80's culminating in the merger with the technology of communications in the mid-nineties to open to humanity a new dimension and an infinite number of systems and applications and services which contributed to the formation of modern civil life and this unprecedented development of modern technologies directly and indirectly affect all urban manifestations, all these information technologies and their digital systems and virtual will change "Our concept of space, time and distances (Meshur, 2013).

The smart city concept has many characteristics and elements that support the social and human reality of the city. It has adopted intelligent sustainability plans, achieving growth while preserving the environment and conserving natural resources. Smart cities also focused on the institutional and structural system of the city and supported all e-Government principles, disaster management and regulation under modern technology and provided adequate infrastructure to support communication networks and services (Khansari et al., 2014).

Smart cities connect more of the city's components and utilize networking capabilities to increase the efficiency and sustainability of urban operations. Typical examples of smart city applications include smart traffic lights, integration of sensors in public vehicles for improved traffic, mobile applications that allow for reporting of minor traffic accidents, for energy and water supply and smart meters for data collection on energy and water consumption (Nani, 2016).

By 2050, 70% of the world's cities will be smart, he said. Intelligent cities based on the internet, computers and broadband technology are a fertile area for research and investment, especially in the Arabian Gulf as they have the foundations to begin building. Recently, however, the obstacles and the most important specialized human cadres and companies prepared for this type of concept are still not adequately prepared.

Problem of the study: The observer of the prevailing situation is aware that the use of modern means of communication via the internet has begun to affect human societies in general and the Arab societies that have

derived and borrowed this cultural component and new technology during the current decade and are increasingly using it, technology is one of the widest doors to all educational, service, investment and administrative fields, bearing with it the various influences on cultural, social and cultural behavior as an inevitable result imposed by the interaction between individuals and technology.

Abu Dhabi city has become one of the most developed cities in the world. It was necessary to shed light on the practical capabilities of the technical components of smart cities in solving problems, especially the problems of transportation and traffic by monitoring current and future problems. In their traditional and habitual behavior to follow up on technology, modifications and developments which has been reflected in their cultural behavior. Therefore, the problem of the present study has emerged in revealing the impact of the introduction of these techniques on the civilized behavior of citizens in the city of Abu Dhabi.

Purpose of the study: As one of the most important pillars of this development and development is the presence of smart cities, we can consider that the main objective of this study is to try to provide sufficient information about smart cities, specifically in Abu Dhabi city and the extent of utilization of these cities.

This evolution has been reflected in the civilized behavior of individuals and the society in full and has influenced development for all individuals regardless of gender or age. All individuals need to keep up with the development of the ability to interact with these changes. Therefore, the objective of the present study is focused on the implications of the evolution of smart cities on the human civilization behavior "Abu Dhabi Model City".

The study questions: To achieve the objectives of the study, the following questions were formulated: the first question is what are the implications of the development of smart cities on human civilization behavior? Abu Dhabi Model City?, this question is divided from the following sub-questions:

- What is the significance of applying smart cities in the field of investments in Abu Dhabi city?
- What is the significance of smart cities in reducing the problem of transportation and roads?
- What is the level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city?

The second main question: is the level of civilized behavior among employees and citizens in Abu Dhabi different according to gender and sector variables?.

The study significance: When technology moves through a major transformation and results in successful innovation, this technology becomes an effective and important experience not only for a particular city but for all surrounding cities. Smart cities are important for all Arab and Western countries, resulting in many benefits such as evidence of ways, reducing accidents and saving time and effort. Citizens and also in the government transactions and the organization of procedures and contributed to the reduction of crimes and reduce the number of violations and the city of Abu Dhabi is a distinguished city among its sisters of cities and smart cities contributed to the development and progress of Abu Dhabi city became famous for its development and progress the beauty of the organization, the presence of technology and the technological developments have greatly improved the delivery of services and citizen's needs.

The significance of the present study is highlighted in the extent to which digital technology contributes to development in terms of highlighting the significance of smart cities and how to coexist with them and trying to find solutions to reduce the traffic crises and the problems of official transactions and contribute to preserving security. Individual and personal interaction and social interaction with others.

Conventional and procedural definitions
Smart city: Smart cities are called on regional systems with creative levels that combine knowledge-based activities and institutions to develop education and creativity and the digital spaces that develop interaction and communication to increase problem-solving capacity in the city. One of the characteristics of a smart city is its high performance in creativity because creativity and problem solving are the most important features of intelligence (Komninos, 2002). This concept is used to build new cities and to manage their services from electricity, lighting, water and heating. Communications and investment services and meet the needs of citizens. This new technology can also be used to manage a large institution by applying automatic control methods through intelligent means.

Civilization behavior: A particular set of values, in most cases and the behavioral pattern imposed by particular civilization, usually develops a complex economy along with complex technologies (Braudel, 1997). This behavior

is characterized by understanding and practicing the elements of healthy coexistence and productive and fertile collective life where the individual is able to interact with the group, the interaction of the member with the rest of the members in one healthy body, the sense of responsibility and democratic handling and making the collective life a common denominator that everyone develops and improves and protect it.

Limitations of the study
Human limitations: The application of the study was limited to citizens in the city of Abu Dhabi working in the sectors of investment, economic, public service, social, health and education.

Time limitations: The study was implemented in 2017.

Spatial limitations: The study was implemented in the city of Abu Dhabi in the United Arab Emirates.

Theoretical framework and previous studies: The term "smart city" or "digital" emerged during the European Conference of the Digital city in 1994 and in 1996 the Europeans (European Digital city project) began in a number of cities. The European authorities adopted mainly the city of Amsterdam as a digital city followed by the city of Helsinki, the aim of the project was to identify strengths and weaknesses in each of the medium-sized cities to become more competitive through local development for all. Wikipedia also interprets the spatial intelligence of cities as referring to information and cognitive processes such as information gathering, "smartness" or "smart" cities. The concept of intelligence enables the unification of a smart city and an ingenious city in a common area of study based on the processes of institutionalization. The focus is on the spatial dimension "Space and cluster are preconditions for this kind of intelligence. The concept also refers to the increased spread and use of ICTs and institutional environments to access science, innovation and city infrastructure to improve problem solving in society (Kababrah, 2014).

Qyum (2014) points out that the digital infrastructure of a large number of Arab countries aiming to build smart cities allows them to do, so, as 7.3% of the total internet users around the world from the Middle East use 88% of these social networking sites every day. Facebook is the most popular social networking site in the region with 58 million users, followed by Twitter and LinkedIn with 5.6 and 8.5 million users, respectively as smart cities are no longer a science fiction, actual presence in several countries around the world.

Abu Dhabi has implemented intelligent transportation by employing modern technologies and to utilize the unused capacity of the road and automatic control of light signals. Abu Dhabi also introduced the first principle of intelligent transportation in 2000 through automatic control of optical signals, via. an advanced communications network equipped with cameras and fiber optic control-related signage directly connected to the vehicle and driver information base (Awadh and Jamal, 2009).

Dubai has also developed comprehensive plans to employ modern technologies in the field of transport and communications. A traffic control center has been established. Traffic cameras have been used to monitor traffic, manage emergency events, adjust traffic according to traffic conditions and size, monitor faults and problems immediately and prioritize traffic directions. According to, specific priorities and criteria Al-Saeed.

Smart cities are undoubtedly the most recently interesting issue, especially after the announcement of Dubai's hosting of Expo 2020. The word "smart" in itself is perhaps more neutral than other terms that are sometimes controversial, such as "green", making it more attracting to a wider audience, it is not desirable to be "intelligent"?! It is not only an attractive term for marketers, it is one of the most important new criteria for evaluating urban space planning (Cowman, 2014).

The technological development of the means of communication and their widespread spread in societies and their transformation from an emerging phenomenon to an influential phenomenon in these gatherings in an unprecedented and rapid way has led to the fact that information technology is the main control in this era which is called the "Information Technology Age". And the impact of this on the formation of urban communities, especially in the smart urban projects and if the main engine and the framework of governance in urban communities in the late 18th century and the 19th century is the industrial revolution only, the information revolution is now the main engine of these projects (Nassar and Wahab, 2008).

The integration of information and communication technologies into the basic processes of sustainable smart cities is important for sustainability and technologies can assist in the creation of cities through innovation and redesign of existing processes. This may include new applications, technologies, smart energy systems, smart transportation, smart water management and smart government. ICTs can provide an approach to sustainability and intelligence in sustainable smart cities, getting them as factors for urban development and integrate information and communication technologies of existing urban infrastructure plays a vital role in achieving the United Nations goals for sustainable development by 2015 with particular attention to the construction of

sustainable infrastructure, the promotion of inclusive and sustainable industrialization and the fostering of innovation, the goal of making cities and human settlements universal, secure, This integration can also play a crucial role in promoting levels of education, achieving gender equality, raising awareness on human rights issues and promoting global cooperation for development (Guzman, 2016).

It is noted that the social behavioral patterns on the ground are steady for increase and high demand for the numbers of people from various technology-using groups, especially youth where their use can reach the degree of addiction which may affect human behavior, social relationships and the ways of thinking about dealing with life variables which would promote individual values rather than social values and the values of collective teamwork which is an important element in the culture of society (Al-Osaimi, 2004).

Literature review: The previous studies dealt with a description of the smart cities their assessment and their impact on the progress, prosperity and development of the countries whether they were foreign or Arab countries.

Sadiq and Mohammed (2013) conducted a study aimed at identifying smart city planning approaches in Damascus. The study showed that a strategy should be formulated to take advantage of modern technologies in urban planning by adopting the concept of smart city. The study also, showed that some applications can be adapted to the requirements and needs. For each city, to increase these applications over time as the transformation of any city to a city with intelligent technologies is a continuous process in addition to the need to prepare operational plans and prioritize the work in line with the reality of the city of Damascus in the transformation into a city with intelligent technologies, search a scientific effort to take advantage of smart technologies in urban planning by formulating a strategy to transform existing cities into smart cities using theoretical studies and Arab and international initiatives in creating smart cities, transforming existing cities into smart cities and proposing a vision for future use. Smart technologies in Damascus by defining strategy, operational plans and setting priorities.

Tok *et al.* (2014) compared smart cities in Qatar and the United Arab Emirates. ICTs published Smart Cities in the GCC region, including Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Oman and Bahrain. The first question to be addressed is the definition of smart cities as this concept is used in a variety of ways in literature and the transformation of cities into smart cities is a newly

emerging strategy to deal with the problems caused by urban population growth and rapid urbanization. Smart city is often defined as a "symbol of a sustainable and livable city". Smart cities are also a crucial means of building social capital, smart cities contribute to social, environmental and political changes in the form of sustainable economic growth to improve the quality of life. The UAE invests in Masdar city and other cities in other states to diversify the UAE's investment portfolio.

Manville *et al.* (2014) provided background information and advice on smart cities in the European Union and explained how existing mechanisms are functioning. A practical definition of smart cities has been developed and cities identified that integrate this definition across member states. Analysis of the goals and objectives of Europe 2020 for smart city initiatives shows that despite the early development phase, the city's smart goals must be more clearly defined and clearly aligned with the development of cities and innovation plans and Europe 2020 to be successful.

Monzon (2015) evaluated smart cities in the Mediterranean region where a project was developed by the Polytechnic University of Madrid to call for the development of the smart city and the application of European and international expertise in the Mediterranean region. Designed to analyze the visualization process, deployment methods or results of smart city projects as in many areas since its concept, the city's smart idea of implementing specific projects has evolved to implement global strategies to meet the broader city challenges. This project takes as a starting point that any kind of city assessment. The smart cities should be presented in response to the real challenges facing the cities of the 21st century and provide an overview of the possibilities available and connect them to the specific challenges of the city a selection of smart city initiatives will be presented to build relationships between the specific city challenges and the real smart projects designed to solve them as a result of this project, a project guide has been developed as a tool for implementing smart city projects that respond efficiently to complex and diverse urban challenges without compromising sustainable development while improving the quality of life of their citizens.

Slater (2015) presents a series of cases studied smart cities from different parts of the world to explore the difference in approaches such as intensive use of ICT to make smart city services, large capital investments to build new infrastructure or entire cities and policy initiatives to build smarter communities and more. The aim is to provide lessons from these case studies, develop ideas that are sustainable and scalable and avoid previous

mistakes. The study sheds particular light on case studies from China, Japan, Brazil, Korea, Kenya, Israel, Germany, the UAE, Colombia, the Philippines, the United Kingdom, Canada, Thailand and Vietnam to explore the dimensions of smart cities in the case of developing and developed countries alike. It also highlights the potential benefits of each case study and explores its significance in the context Every city embraces a vision according to the aspirations of citizens (connected city, sustainable city, low carbon city, etc.) to target the prevailing issue and build solutions around it. Smart cities are also focused on attracting investments from all over the world and the creation of global cities by investing in services such as high-speed and intelligent transportation systems and economic climate the proper and other internet. Moreover, cities transformed are considered as a social laboratory to devise new ways to improve the quality of life for citizens and the experience of new initiatives.

Efthymiopoulos (2016) conducted a study aimed at identifying security in smart cities in Dubai. The study shows that Dubai is emerging as a leading partner not only in technological innovation but also in infrastructure design and strategic security which will globally add the city and leadership to the smart ones. The world's leading in the current and future challenges, the strategic objective is the intelligent behavior of Dubai by 2020. Dubai is a city of strategic technology, innovation and management as it is a global, vibrant and emerging economy among others. Dubai may become an economic hub for the Middle East and North Africa Region. The study is to explore, analyze and discuss elements of strategic management, innovation and development. It also aims to discuss elements of strategic security to make the city safe on the internet in a smart infrastructure and equipped with services.

Madakam and Ramaswamy (2016)'s study of the state of Masdar city in the UAE as a smart and sustainable city revealed that it will be rich enough in renewable energy sources and sustainable buildings. The researchers found that this smart, sustainable city will be fully energy efficient through solar power then smart cities in Abu Dhabi's source city are the best for using natural resources in smart buildings, renewable energy sources and sustainable buildings, reducing energy consumption along with waste management.

Comment on previous studies: Literature review have shown the impact of smart cities on countries in terms of their development and contribution to their growth and advancement among other countries. The study of Tok *et al.* (2014) on smart cities in Qatar and the United Arab Emirates. Manville *et al.* (2014) and Monzon (2015)

provided a comprehensive overview of the possibilities available, linking them to the specific challenges of the smart city, urging the development of projects as a tool for smart city projects. Finally, a study by Slater (2015) conducted to show how to use intensive ICT make huge investments through smart cities.

MATERIALS AND METHODS

Study procedures: This study used the descriptive approach to suit the nature of the study which aims to reveal the implications of the evolution of smart cities on human civilization in Abu Dhabi city. The descriptive approach which is based on the study of reality is a description of its strengths and weaknesses.

The study population: The population of the study will be consisted of citizens of Abu Dhabi city as employees of investment and economic, public service, social, health and educational sectors during 2017.

The study sample: The study sample consisted of 2075 employees in the sectors of investment and economic, public service, social, health, educational in the city of Abu Dhabi of the sample available in the community were selected randomly (Table 1).

As shown for the gender variable, the number of male and female employees 1226 and 59%, females 849 and 41%, for the sector variable, the number of employees in the social services sector reached 528 and by 25.4%. The number of employees in the social sector was 346 and by 16.7,35.1 and 17.1%. The number of employees in the educational sectors category was 416 and by 20%.

The study instrument: The questionnaire consisted of two parts, the first part included the personal and functional variables of the study sample (gender, sector), the second part included three areas, the first area, "The significance of applying smart cities in the field of

Table 1: Distribution of study sample individuals due to gender variables and sectors

Variable/Category	No.	Percentage
Gender		
Male	1226	059.1
Female	849	040.9
Total	2075	100.0
Sectors		
Economic investment	430	020.7
Public services	528	025.4
Social services	346	016.7
Health services	355	017.1
Educational services	416	020.0
Total	2075	100.0

investments" includes 5 paragraphs and the second area, "The significance of smart cities in reducing the problem of transportation and roads" and finally the field of "satisfaction with smart cities in the service of citizens" and included 20 paragraph.

Validity: The 8 well experienced and competent arbitrators in administrative sciences, information technology and Arabic language, aiming at judging the appropriate wording of the paragraphs and the extent of affiliation of the paragraphs of the study tool have been taken in consideration as well as the views and suggestions of theirs and the necessary deletion and modification, a questionnaire consisted of 31 paragraphs was applied (Table 2).

In order to a certain the indicators of the structural honesty of all the questionnaires, they were applied to a sample of 90 individuals from the study community and from outside the original sample and to calculate the correlation coefficients between each paragraph and the field to which it belongs and the questionnaire as a whole.

Table 2: Correlation coefficients between the paragraph, the domain to which it belongs and the questionnaire as a whole

No.	Correlation to domain	Correlation to tool as a whole
1	0.75**	0.61**
2	0.72**	0.60**
3	0.75**	0.66**
4	0.64**	0.58**
5	0.56**	0.51*
6	0.62**	0.52*
7	0.60**	0.54**
8	0.63**	0.59**
9	0.66**	0.59**
10	0.67**	0.60**
11	0.68**	0.61**
12	0.63**	0.55**
13	0.65**	0.57**
14	0.83**	0.79**
15	0.66**	0.58**
16	0.60**	0.51*
17	0.69**	0.58**
18	0.72**	0.62**
19	0.74**	0.66**
20	0.72**	0.61**
21	0.75**	0.68**
22	0.77**	0.61**
23	0.74**	0.58**
24	0.67**	0.59**
25	0.77**	0.61**
26	0.66**	0.55**
27	0.65**	0.57**
28	0.69**	0.60**
29	0.78**	0.64**
30	0.60**	0.57**
31	0.59**	0.55**

**Significance level ($\alpha \leq 0.01$); *Significance level ($\alpha \leq 0.05$)

Table 2 shows that correlation coefficients between each paragraph and its range ranged between 0.83-0.56. The correlation coefficients between each paragraph and the whole questionnaire ranged from 0.10-0.79 and the affiliation of paragraphs to the same areas.

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Reliability: To extract the reliability of the study instrument, it was applied two times by a 2 weeks interval on a sample of 90 workers and citizens of the study community and outside the original sample. The correlation coefficient between the two applications was used to extract the reliability of the (R-test) α to all areas of study and questionnaire as a whole to extract internal consistency and Table 3 shows this.

It is shown in Table 3, that the coefficients of the Cronbach' alpha for the areas of resolution ranged from 0.81-0.88 and the Cronbach' alpha coefficient as a whole was 0.85. All stability coefficients were high and acceptable for study purposes. Stability coefficients for the areas of resolution ranged between 0.79-0.82. (0.83). All stability coefficients are high and acceptable for the purposes of the study where the stability coefficient is acceptable if it exceeds (0.70).

Instrument scale: The questionnaire was used to measure the opinions of the sample members of the study. The results of the survey were carried out as follows, very high) grade 5, (OK) (2) and (very weak) are given a grade (1) with a sign ()) in front of the answer which reflects their degree of approval. The following classification is based on the following arithmetic: arithmetical mean >2.33 low grade, arithmetic average 2.34-3.66 E, arithmetic average 3.67-5 high grade rating.

Study procedures: In order to get the objectives of the study and to reach its results obtained, the researcher carried out the following procedures, review the theoretical literature and previous studies related to the subject of the study, determine the community and sample of the study which includes all citizens residing or working in the city of Abu Dhabi.

Table 3: Cronbach alpha coefficients and the test R-test of domains for instrument as a whole

Domain	No. of item	Cronbach alpha	R-test
The significance of applying smart cities in the field of investments	5	0.81	0.79
The significance of smart cities in reducing the problem of transportation and roads	6	0.86	0.80
The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	20	0.88	0.82
Questionnaire of civilized behavior as a whole	31	0.85	0.83

Building a questionnaire using some previous studies related to the subject of the study and the researcher's experience in the electronic services provided to the city by means of communication and the internet.

Verification of indicators of honesty and consistency of the study tool (questionnaire). Distribution of the study tool in the final form to the sample of the study in a random way and by e-mail. The questionnaire was organized electronically and distributed to different categories of citizens of employees in different institutions and companies in Abu Dhabi city.

Monitoring the data and conducting the appropriate statistical processing according to the study questions using the Statistical Packages for Social Sciences (SPSS) program to reach the results. To propose a set of recommendations in light of the findings of the study.

Statistical processing: To answer the study questions, the following statistical treatments were used through the Statistical Package program (SPSS) where the frequencies and percentages of the variables of the sample of the study sample, the arithmetic averages and the standard deviations of the responses of the study sample members were calculated for all fields of the study instrument. The differences in the fields of study according to the personal and functional variables of the sample members and the Analysis of Variance (ANOVA) to detect the differences in the total score of the questionnaire according to, the personal and functional variables of the sample members.

RESULTS AND DISCUSSION

This study includes the results of the study aimed at identifying the implications of the evolution of smart cities on human civilization behavior in the city of Abu Dhabi.

Results answering the first question
The main question: What are the implications of the development of smart cities on human civilization behavior "Abu Dhabi Model city"? To answer this question, the arithmetical averages and standard deviations were calculated for all fields of cultural behavior and the scale as a whole.

Table 4 shows that the mathematical averages of civilized behavior ranged between 4.03-4.16, all of them with high scores, the most prominent of which is the area which states "The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city" which stipulates "The significance of smart cities in the field of investments" with an average of 4.12 and high and the lowest of field which states "The significance of smart cities in reducing the problem of transport and roads," and to a high degree, to civilized behavior as a whole 4.13 and to a high degree. This is due to the role of smart cities and their facilities in dealing with the problems of urban life. Data technologies have begun to change the way cities work, through the use of data to improve their operations, providing safe infrastructure for investment creation, tailored to the needs of individuals. Citizen's satisfaction was high due to the fact that they were aware of the facilities offered by smart cities and the widespread use of smart phones and mobile devices that enabled citizens and employees alike to monitor problems and provide feedback to the city center.

This finding was consistent with the study of (Tok *et al.*, 2014) which noted that smart cities contribute to social, environmental and political changes in the form of sustainable economic growth to improve quality of life. The UAE invests in Masdar city and other cities in other states to diversify investmentp portfolio of the UAE.

Sub-question 1: What is the significance of applying smart cities in the field of investments in Abu Dhabi city? To answer the first sub-question, means and standard deviations were calculated for all items of the significance of smart cities in the field of investments.

Table 5 shows that the mean and standard deviations of the paragraphs of the significance of applying smart cities in the field of investments ranged between (3.89-4.29) all of which are high, the most prominent of which is paragraph which states that "smart cities facilitated electronic applications" which states that "intelligent cities have facilitated the implementation of various projects" with an average of 4.26 and a high level and the lowest paragraph which states "smart cities are alleviated from security problems" and to a high degree and the arithmetic average of the significance of applying

Table 4: Means and standard deviations of "civilized behavior" and it's domains (n = 2075)

Domain	Mean	SD	Rank	Degree
The significance of applying smart cities in the field of investments	4.12	0.71	2	High
The significance of smart cities in reducing the problem of transportation and roads	4.03	0.66	3	High
The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.16	0.59	1	High
Civilized and human behavior as a whole	4.13	0.54	-	High

Table 5: Means and the standard deviations of the significance of smart cities in the field of investments (n = 2075)

Paragraphs	Mean	SD	Rank	Degree
Smart cities have facilitated the implementation of various projects	4.26	0.80	2	High
Smart cities have attracted local and international investment	4.13	0.87	3	High
Smart cities have facilitated e-Applications	4.29	0.91	1	High
Smart cities have contributed to the expansion of investments andthe development of large-scale projects to produce huge investments	4.03	0.99	4	High
Smart cities have mitigated security-related issues	3.89	1.12	5	High
The significance of smart cities in the field of investments as a whole	4.12	0.71	-	High

Table 6: Means and standard deviations for each item of the significance of smart cities in reducing the problem of transport (n = 2075)

Paragraphs	Mean	SD	Rank	Degree
Smart cities have made it easy to move from place to place by providing information on important places to speed up access	4.02	1.12	3	High
Smart cities have alleviated the problems of transportation and roads, especially in congestion and emergency situations	4.15	0.98	2	High
Smart cities have reduced time and effort to reach the destination	4.23	1.05	1	High
Smart cities have contributed to reducing traffic accidents	4.01	1.06	5	High
smart cities have facilitated emergency service for transportation	4.03	1.08	4	High
Smart cities have been able to provide transportation easily and easily by providing access to information about the needs of citizens	3.73	1.12	6	High
Domain as a whole	4.03	0.66		High

smart cities in the field of investments each 4.12 is medium. This is due to the advanced services offered by smart cities which contribute to facilitating investments. Information technology is the main infrastructure and the basis for providing basic services to investors and individuals. These services include comprehensive infrastructure that can adapt to changing economic, social and cultural conditions, waste management, automated sensor networks and data centers.

The result was consistent with a study (Tok *et al.*, 2014) which showed that Masdar city in Abu Dhabi opened up opportunities in the market by attracting international investors and joint ventures. The study (Monzon, 2015) noted the significance of smart cities lies in improving the quality of life of citizens.

Question 2: What is the significance of smart cities in reducing the problem of transportation and roads? To answer this question, the means and standard deviations were calculated for all item of the significance of smart cities in reducing the problem of transportation and roads and total them.

Table 6 shows that the means and the standard deviations of the significance of smart cities in reducing the problem of transport and roads ranged between (3.73-4.23) all of which are high, the most prominent of which is paragraph 8 which states that "smart cities contributed to reducing time and effort. Paragraph 7 indicates that "smart cities are alleviated from transportation problems and roads, especially in overcrowding and situations" with an average of 4.15 at a high level whereas the lowest means and the standard deviations are shown in paragraph 11 that states "smart cities have been able to provide transportation easily and

by providing information services on citizen's needs." The mean is that smart cities are important in reducing the problem of transportation and roads as a whole of 4.03 at a high degree. This is due to smart transportation and smart traffic systems provided by smart cities to reduce overcrowding and energy consumption as well as to improve the use of public transport in the city and to facilitate the movement of citizens within urban communities through transport networks which is reflected in the economic growth of the city. It is worth mentioning that smart city systems collect and analyze data and information on roads and traffic conditions continuously and convey real-time information on traffic, parking conditions and public transport options to provide the best solutions and effective decision making, thus improving transportation, traffic and traffic accidents.

This finding was consistent with the results of the Sadiq and Mohammed (2013) which showed that smart cities contribute to solving part of the traffic problems without the need to create new roads or expand existing ones.

Question 3: What is the level of satisfaction with smart cities in the service of citizens and serving the city of Abu Dhabi? In order to answer the third question, means and standard deviations were calculated for all paragraphs levels of satisfaction with smart cities in the service of citizens and service of Abu Dhabi city and all paragraphs of each domain.

Table 7 shows that the mean and standard deviations of the level of satisfaction with smart cities in the service of citizens and service of the city of Abu Dhabi ranged from 3.94-4.33, all of them in high grades, the most

Table 7: The means and the standard deviations of satisfaction level smart cities, serving citizens of Abu Dhabi and the city as a whole (n = 2075)

Paragraphs	Mean	SD	Rank	Degree
Smart cities have facilitated the ability to process transactions electronic way	4.05	0.95	17	High
Smart cities have provided the ability to use automation in homes and offices	4.18	1.03	11	High
Smart cities have upgraded emergency services to required extent	4.28	0.89	3	High
Smart cities meet the needs of citizens	4.33	0.80	1	High
Smart cities have raised the economic level of citizens by providing access to jobs through the easy marketing of services and facilitate access to jobs	4.20	0.83	7	High
Smart cities have increased the economic level of Abu Dhabi city	4.08	0.97	16	High
Smart cities raised the economic level for citizens	4.15	0.85	12	High
Smart cities have increased the cultural level of citizens	3.94	1.04	20	High
Smart cities have increased security in the city of Abu Dhabi	4.22	0.97	5	High
Smart cities have provided a smart environment for citizens in terms of reducing pollution	4.18	0.88	9	High
Smart cities have increased security in the town of Abu Dhabi	4.33	0.85	2	High
Smart cities have increased citizen confidence in information security	4.12	0.96	14	High
Intelligent cities have increased awareness of individuals	4.12	0.94	13	High
Smart cities have contributed to improving the quality of life for citizens	4.19	0.91	8	High
Smart cities provided better educational services in terms of schools, colleges and universities	4.04	0.88	18	High
Smart cities provided a better life for citizens	4.18	0.90	10	High
Smart cities have facilitated the process of extracting contracts and investments from the internet	4.21	0.90	6	High
Smart cities have increased the comfort of citizens in meeting services	4.25	0.92	4	High
Smart cities have reduced the effort and time to do business	3.97	1.15	19	High
Smart cities have increased citizen confidence in the country	4.10	0.90	15	High
Domain as a whole	4.16	0.59		

prominent of which is paragraph 15 which states that "smart cities meet the needs of citizens", "at a high degree and then paragraph 22 which states that" smart cities increased security in the town of Abu Dhabi "with a mean of 4.33 and high and the lowest paragraph 19 which states that" smart cities increased the cultural level citizens "at a medium degree and the mean reached the level of satisfaction with smart cities in the service of citizens and served Abu Dhabi city as a whole of 4.16 at a medium degree. This is due to the fact that smart cities equipped with ICT systems have contributed to providing a digital environment that has been a means of improving the quality of life of citizens, enhancing the sense of happiness and health in addition to improving and improving the economic, social and environmental sustainability of the city. Managing and facilitating daily life.

The result was agreed with a study conducted by Slater (2015) which demonstrated the significance of applying smart cities to meet the needs of citizens and improve the quality of life in these cities. Madakam and Ramaswamy (2016) noted that smart cities in Abu Dhabi's Masdar city are the best for using natural resources in smart buildings, renewable energy sources and sustainable buildings and reducing energy consumption along with waste management.

Question 4: Does the level of civilized behavior among employees and citizens in Abu Dhabi differ according to gender and sector variables? To answer this question, the means and standard deviations for all the domains of civilized behavior of workers and citizens have been extracted according to different gender and sector

variables. MANOVA has also been applied to detect differences in the fields of study according to gender and sector variables, ANOVA for the total score of behavior civilization.

Table 8 shows the existence of prominent differences between the mean for the fields of study and the scale as a whole according to, the different sex and sector variables. To detect the statistical significance, the Multiple Variance Analysis (MANOVA) was applied to detect differences in the fields of study according to gender and sector variables, for the total score, Table 9 shows this.

Table 9 shows the following: *there were statistically significant differences at the level of ($\alpha \leq 0.05$) in the domain (the significance of applying smart cities in the domain of investments) to the gender variable whereas the value F for domain at (10.228) and statistical significance at 0.001 with mean of 4.17 and the male mean of 4.09. This is due to the increasing role of women in investments in Abu Dhabi city where they become more aware of the needs of investments and the level of infrastructure services that depend on the modern technology needed by investors.

There were no statistically significant differences for the gender variable at the level of ($\alpha \leq 0.05$) in the study domains (the significance of smart cities in reducing the problem of transportation and roads and the level of satisfaction with smart cities, serving the citizens and Abu Dhabi city, respectively of whereas F-value at (2.954) (2.425) at the statistical significance level at (0.086) (0.120), respectively. The participants of the study (male and female) noticed the significance of smart cities in providing solutions to the problems of transportation and

Table 8: The mean and standard deviations of each domain according to the variables

Variable/Category	Domain	Mean	SD
Gender			
Male	The significance of applying smart cities in the field of investments	4.09	0.734
	The significance of smart cities in reducing the problem of transportation and roads	4.05	0.655
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.14	0.602
	Domains as a whole	4.12	0.556
Female	The significance of applying smart cities in the field of investments	4.17	0.680
	The significance of smart cities in reducing the problem of transportation and roads	4.06	0.662
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.18	0.562
	Domains as a whole	4.14	0.508
Sector			
Economic	The significance of applying smart cities in the field of investments	4.17	0.708
investments	The significance of smart cities in reducing the problem of transportation and roads	4.02	0.678
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.19	0.604
	Domains as a whole	4.15	0.573
Public services	The significance of applying smart cities in the field of investments	4.19	0.726
	The significance of smart cities in reducing the problem of transportation and roads	4.01	0.667
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.13	0.617
	Domains as a whole	4.11	0.570
Social services	The significance of applying smart cities in the field of investments	4.07	0.763
	The significance of smart cities in reducing the problem of transportation and roads	4.03	0.645
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.24	0.525
	Domains as a whole	4.17	0.477
Health services	The significance of applying smart cities in the field of investments	4.19	0.656
	The significance of smart cities in reducing the problem of transportation and roads	4.03	0.650
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.15	0.557
	Domains as a whole	4.13	0.493
Educational	The significance of applying smart cities in the field of investments	4.06	0.702
services	The significance of smart cities in reducing the problem of transportation and roads	4.07	0.643
	The level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	4.09	0.591
	Domains as a whole	4.08	0.536

Table 9: Results of Multivariate Analysis (MANOVA) to detect differences in all domains of civilized behavior according to gender and sector variables

Source of variance/Domains	Sum of squares	df	Mean of squares	F-values	Sig
Gender					
The significance of applying smart cities in the field of investments	0005.167	1	5.17	10.228	0.001
The significance of smart cities in reducing the problem of transportation and roads	0001.279	1	1.28	02.954	0.086
Level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	0000.827	1	0.83	02.425	0.120
Sector					
The significance of applying smart cities in the field of investments	0000.539	1.000	0.54	01.875	0.171
The significance of smart cities in reducing the problem of transportation and roads	0007.250	4	1.81	03.588	0.006
Level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	0001.547	4	0.39	00.893	0.467
Error					
The significance of applying smart cities in the field of investments	1045.161	2069	0.51		
The significance of smart cities in reducing the problem of transportation and roads	0895.800	2069	0.43		
Level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	0705.601	2069	0.34		
Total corrected					
The significance of applying smart cities in the field of investments	1055.766	2074			
The significance of smart cities in reducing the problem of transportation and roads	0898.221	2074			
Level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city	0711.835	2074			

*Statistical significance at the level of significance ($\alpha \leq 0.05$)

make it safer, more comfortable and saver for time and effort as they are satisfied with the level of services provided by smart cities to improve the quality of their lives.

There were statistically significant differences for the sector variable at the level of ($\alpha \leq 0.05$) in the study domains (the significance of smart cities in the domain of investments and the level of satisfaction with smart cities in serving the citizens and Abu Dhabi city) where F-value was respectively at (3.588) (4.199) at the statistical significance level of (0.006) (0.002), respectively. This is attributed to the participants of the study sample who research in the various sectors of investment, economic,

services, social, health and education and they agreed with the significance of smart cities in attracting investments and they also, expressed their satisfaction with the services provided by smart cities to improve the lives of citizens in various aspects.

There were statistically significant differences for the sector variable at the level of $\alpha \leq 0.05$ in the study domains in the field (the significance of smart cities in reducing the problem of transport and roads) where the F value was 0.893 and statistical significance at 0.467 and to detect the trends of differences, Scheffe test was applied according to the sector variable on all domains of the study Table 10.

Table 10: Results of Scheffe test to detect differences in study domains due to sector) variable

Domain/Category	Mean	Investment and economic	Public services	Social services	Health services	Educational services
The significance of smart cities in reducing the problem of transportation and roads						
Investment and economic	3.99	-	0.011	-0.016	-0.015	-0.055
Public services	4.00	-	-	-0.028	-0.027	-0.067
Social services	4.04	-	-	-	0.000	-0.039
Health services	4.04	-	-	-	-	-0.039
Educational services	4.07	-	-	-	-	-
Level of satisfaction with smart cities in the service of citizens and the service of Abu Dhabi city						
Investment and economic	4.19	-	0.06	0.05	0.04	0.10
Public services	4.13	-	-	0.11	0.02-	0.04
Social services	4.24	-	-	-	0.09	0.15
Health services	4.15	-	-	-	-	0.06
Educational services	4.09	-	-	-	-	-

Table 11: Results of ANOVA to detect differences in civilized behavior level as a whole according to gender and sector variables

Source of variance	Sum of squares	df	Mean of squares	F-values	Sig.*
Gender	000.539	1	0.54	1.875	0.171
Sector	002.524	4	0.63	2.194	0.067
Error	595.156	2069	0.29	-	-
Total corrected	598.009	2074	-	-	-

*Statistical significance at the level of significance ($\alpha \leq 0.05$)

Table 10 showed significant differences in the significance of smart cities in reducing the problem of transportation and roads between the investment and economic sectors and the educational sectors in favor of the educational sectors with a mean of 4.07 while the mean of the economic and investment sectors at 3.99. The difference between the public services and the educational sectors for the educational sectors has a mean of 4.07 while the mean of the general service sectors at 4.00. This is due to the fact that the category of employees or beneficiaries (students) in the educational sectors depends largely on transportation daily by providing safe and comfortable transportation, so, they felt the significance of smart cities in providing safe and comfortable transportation.

There were also statistically significant differences in the level of satisfaction with smart cities in the service of citizens and service of the city of Abu Dhabi, between the sectors of investment and economic sectors and the educational sectors for the benefit of social sectors with a mean of 4.24 while the mean of the economic and investment sectors of 4.19 and the existence of differences between sectors of 4.24 and the educational mean of 4.09. This is attributed to the fact that the investment and social sectors are very satisfied with the city services that develop in Dubai, especially compared to previous periods when the level of these services was less and smart cities provide them with electronic services contribute to reduce their problems related to place services and inquire easily about Any information by available electronic networks.

Table 11 shows that there are no statistically significant differences due to gender and sector variables at the significance level ($\alpha \leq 0.05$) where, respectively the values of F (1.875) (2.194) and at the level of statistical significance (0.171) (0.267).

CONCLUSION

This is due to the agreement of the study sample members on the significance and usefulness of smart cities and their impact on human civilization behavior which changed and developed the behavior of residents in these cities and adopted the ideas of saving time and effort and keeping information security for individuals and cities in general and contributed to the advancement of these cities compared to other cities.

RECOMMENDATIONS

Upon having reached the findings, the study suggests the following recommendations: creating a guide to facilitate the handling of smart cities and their applications and to increase awareness among individuals. Creating simulation models of reality to contribute to raising awareness and education of children and the elderly, especially to deal with these cities.

Activating applications in mobile phones for easy access to required services from these cities. Upgrading the quality of the internet and reduce its costs to get it usably easier in communicating and using. Conducting more studies on smart cities and recognizing their impacts on human civilization behavior.

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