

E-Governance and Its Role in Infrastructure Services of UAE, Case Study—Dubai

Ashmita Karmakar

Abstract As per World Bank (www.worldbank.org) definition (AOEMA report): ‘E-Government refers to the use by government agencies of information technologies such as Wide Area Networks, the Internet and mobile computing that have the ability to transform relations with citizens, businesses and other arms of government’. These technologies are meant to serve a variety of different ends that includes: (1) Better delivery of government services to citizens. (2) Improved interactions with business and industry. (3) Citizen empowerment through access to information. (4) More efficient government management etc. Many countries are adapting to the E-Governance and its applications in the field of infrastructure to improve the governmental services and providing empowerment to the citizens. Dubai is an example of one such city in the UAE which has been at the forefront of adopting the advanced technologies to improve the efficiency of governance and including itself in the list of smart cities. This chapter is effort to represent Dubai as the city which has transformed itself to form smart city and adopted the technologies for E-Governance in the field of infrastructure. With the effort of visionary leadership of UAE has initiated numerous E-Government programmes that aimed at effective policy making, and service delivery. The city is constantly growing with substantial influx of expat population every year to contribute to the city’s trade and commerce. To achieve the target, the city is making efforts to reach to every individual through information and network especially in the field of infrastructure facility provision creating a strong bond with the government. The smart technology in E-Governance becomes active from the time

A. Karmakar (✉)
Dubai Internet City, C/O Ashish Gupta, 3d Floor, Injaz Building, PO Box 11549,
Dubai, United Arab Emirates
e-mail: ashmita.karmakar@gmail.com

when a person enters the city as well as in day to day services. Today the UAE is considered to have one of the most advanced and world-class information and communication technology infrastructures. This chapter has listed few smart services that are used in Dubai as a part of E-Governance. With the Information technology picking up, the e-services are becoming mere necessity in the human life. Use of the smart facilities to interact with the Dubai residents is offering convenience in better service delivery, people empowerment, easy access to information, improved productivity and cost savings in business and participation in public policy decision-making in the governmental activities. Although there are some grey areas and gaps for which the city is making best efforts to come up with an efficient solution and set up an example of E-Governance in front of the developed world. With the success of its E-Government initiatives and its overall popularity for its strong infrastructure and standards of living, it will achieve its goal in public sector integration, and successfully deliver its services to all residents.

Keywords E-Government · Infrastructure · Information technology · Smart city

1 Introduction

Information and Communication Technologies (ICT) have affected the ways in which people, governments and businesses interact with each other. The rapid diffusion of the Internet, mobile telephone and broadband networks demonstrate how pervasive this technology has become. ICT has become the fundamental building blocks of modern societies and digital economies. Yet, the revolutionary pace in countries worldwide is dependent on the preparedness of several factors of both social and political environments. From a government standpoint, E-Government adoption is becoming an unquestionable task. E-Government deals with facilitating the operation of government and the distribution of governmental information and services. The ultimate goal of E-Government is to be able to offer an increased portfolio of public services to citizens in an efficient and cost effective manner. Anticipated benefit of E-Government include efficiency, improved services, better accessibility of public services, and more transparency and accountability [1].

The objective of the chapter is to study the development of E-Governance in Dubai City in the last few decades and its future goals/targets. The chapter provides with the details of E-Governance and how the city of Dubai has transformed itself to adopt various means in order to establish itself as a smart city. The E-Government of Dubai has implemented various ways to interact with its residents/visitors and provide them with easy access to government-related information, power to participate in government-related activities and also in day to day use of services. This chapter has highlighted especially on the smart infrastructure services which forms a major link between the residents and the E-Government of Dubai.

1.1 The Term E-Governance

E-Governance can be defined as the performance of a government via electronic medium in order to facilitate an efficient, speedy and transparent process of disseminating information to the public, and other agencies, and also for performing government administration activities. E-Governance is generally considered as a wider concept than E-Government, since it can bring about a change in the way how citizens relate to governments and to each other. It can bring forth new concepts of citizenship, both in terms of citizen needs and responsibilities. Its objective is to engage, enable and empower the citizen.

World Bank (www.worldbank.org) definition (AOEMA report): ‘E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions’.

United Nations (www.unpan.org) definition (AOEMA report): ‘E-Government is defined as utilizing the Internet and the world wide web for delivering government information and services to citizens’.

1.2 Objectives of E-Governance

The strategic objective of E-Governance is to support and simplify governance for all parties—government, citizens and businesses. E-Governance uses electronic means to support and stimulate good governance. In other words the objectives of E-Governance are the ways to achieve the objectives of good governance. Good governance can be seen as an exercise of economic, political and administrative authority to better manage affairs of a country from national to local levels.

Regarding E-Government, the distinction is made between the objectives for internally focused processes (operations) and objectives for externally focused services.

External strategic objectives. The external objective of E-Government is to satisfactorily fulfil the public’s needs and expectations on the front-office side, by simplifying their interaction with various online services. The use of ICTs in government operations facilitates speedy, transparent, accountable, efficient and effective interaction with the public, citizens, business and other agencies.

Internal strategic objectives. In the back-office, the objective of E-Government in government operations is to facilitate a speedy, transparent, accountable, efficient and effective process for performing government administration activities. Significant cost savings (per transaction) in government operations can be the result.

Thus, E-Governance is more than just a Government website on the Internet with Political, social, economic and technological aspects forming its integral part.

2 Development of Dubai

Dubai is located on the southeast coast of the Persian Gulf and is one of the seven emirates that make up the country. Abu Dhabi and Dubai are the only two emirates to have veto power over critical matters of national importance in the country's legislature.

Dubai was formally established on June 9, 1833, by Sheikh Maktoum bin Butti Al-Maktoum when he persuaded around 800 members of his tribe of the Bani Yas, living in what was then the Second Saudi State, to follow him to the Dubai Creek by the Abu Falasa clan of the Bani Yas. It remained under the tribe's control when the United Kingdom agreed to protect the Sheikdom in 1892 and joined the nascent United Arab Emirates upon independence in 1971 as the country's second emirate. Its strategic geographic location made the town an important trading hub, and by the beginning of the twentieth century, Dubai was already an important regional port. The city has made its global identity for its skyscrapers and high-rise buildings, world's tallest building, ambitious development projects including man-made islands, hotels and some of the largest shopping malls in the region and the world.

3 Need for E-Governance in Dubai

3.1 Dubai and Its Global Identity

Today, Dubai has emerged as a cosmopolitan metropolis that has grown steadily to become a global city and a business and cultural hub of the Middle East and the Persian Gulf region. It is also a major transport hub for passengers and cargo. Although Dubai's economy was historically built on the oil industry, the emirate's Western-style model of business drives its economy with the main revenues now coming from tourism, aviation, real estate and financial services. Dubai has recently attracted world attention through many innovative large construction projects, sports events and the sole host for World Expo 2020.

3.2 Practice of Traditional Governance

Similar to other Emirates Dubai had a Traditional Government. Traditional governments were always small, both in size and scope. This was natural, given the size of the communities and the difficult economic environment in which they

existed. However, this environment valued consensus as well as participation in a traditional form that would exist within the context of a majlis or council. In this framework, issues relevant to the community were discussed and debated. Opinions were expressed and the sheikh would take these opinions into consideration prior to taking a decision. Traditionally, the ruler of an Emirate—the Sheikh—was the leader of the most powerful tribe, while each tribe, and often its subsections, also had a chief or Sheikh. The Sheikhs maintained their authority only as long as they were able to retain the support of their people. This in essence, was a form of direct democracy. Part of that process was the unwritten, but strong, principle that the people should have open access to their ruler, and that he should hold a frequent and open majlis, in which his fellow citizens could voice their opinions. It is now evident that it is these elements of governance that has served as a solid foundation in maintaining the unique identity of the country against a backdrop of rapid economic and social changes.

3.3 Initiation of a Change in Governance

Such a direct democracy, which may be ideally suited to small societies, becomes more difficult to maintain as the population grows. Simultaneously, the increasing sophistication of government administration means that many people now find it more appropriate to deal directly with these institutions on most matters, rather than seek personal meetings with their rulers.

3.3.1 A Balanced Approach

The changes envisioned and undertaken by the UAE leadership represent an indigenous initiative reflecting the need to transform the country's traditional political heritage—based on consensus, the primacy of the consultative process and gradual social change—into a more modern system that takes into account the rapid socio-economic advances made since the establishment of the federation.

3.3.2 Adaptation of E-Governance by Dubai

ICT have affected the ways in which people, governments and businesses interact with each other. The rapid diffusion of the Internet, mobile telephony and broadband networks demonstrate how pervasive this technology has become. Today, ICT is considered as one of the fundamental building blocks of modern societies and digital economies.

From a government standpoint, E-Government adoption is becoming an unquestionable task. E-Government deals with facilitating the operation of government and the distribution of governmental information and services. The ultimate

goal of E-Government is to be able to offer an increased portfolio of public services to citizens in an efficient and cost effective manner. Anticipated benefits of E-Government include efficiency, improved services, better accessibility of public services and more transparency and accountability. The primary drivers of E-Governance is explained in Fig. 1 [1].

In a smart city initiative, the citizen and Government merge together and cannot be distinguished from one another other as the end user is just a service consumer and is heavily dependent on both the E-Government and private sectors.

Dubai has been investing heavily in adopting and implementing ICT in its government and private sectors. The Global Information Technology Report 2010–2011 indicates that the UAE leads the MENA region in leveraging ICT for increased economic diversification and competitiveness. The E-Government programme in the UAE is a key initiative of the UAE-Government Strategy 2011–2013 that lays the foundation to achieve UAE Vision 2021 [2] (Fig. 2).

The strategy is divided into seven general principles as follows:

- Enhance the role of federal entities in devising effective regulations and integrated policies by successful planning and enforcement.
- Enhance effective coordination and cooperation among federal entities and with local governments.
- Focus on delivering high quality, customer-centric and integrated government services.
- Invest in human resource capabilities and develop leaders.
- Promote efficient resource management within federal entities and leverage dynamic partnerships.

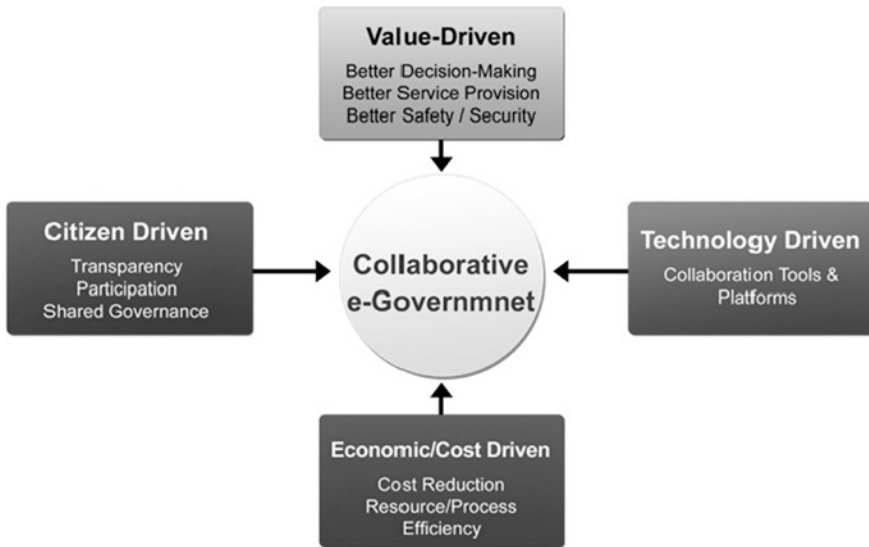


Fig. 1 Showing the importance of E-Government. Source [1]

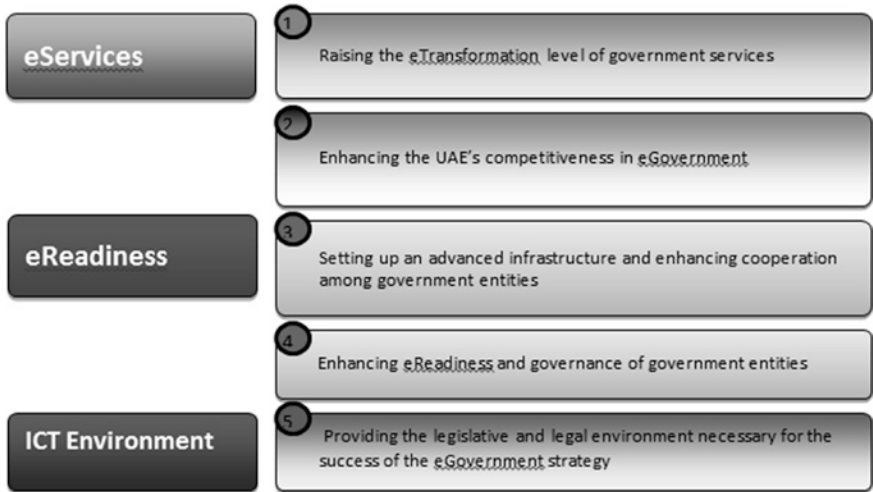


Fig. 2 Showing the important strategic domain of action in E-Governance. Source <http://www.emiratesegov.ae>

- Pursue a culture of excellence through strategic thinking, continuous performance improvement, and superior results.
- Enhance transparency and accountable E-Governance mechanisms throughout the federal entities.

4 Achievements of Dubai as a Smart City

According to 'Internet World Statistics', the UAE has 5,859,118 Internet users as of June 12, 2013, 70.9 % of the population of the country has access to internet either through web or mobile devices. Usage of E-Services has become a daily norm for Dubai citizens and this high percentage of users makes Dubai implementing smart city-related initiatives and projects.

Although Dubai is in the initial phase of setting up the building blocks for a smart city transformation, the city has made a remarkable progress in the use of smart devices/technologies in the field of infrastructure. The E-Government has tried to introduce maximum number of services with user friendly IT applications thus establishing a strong network between Government and the citizens. In case of Dubai use of smart card and smart phone has proved to be successful in connecting to the masses (Fig. 3).

This chapter has tried to highlight few prominent smart technologies adopted by Dubai city so far on the way to smart city development. These technologies are as listed below.

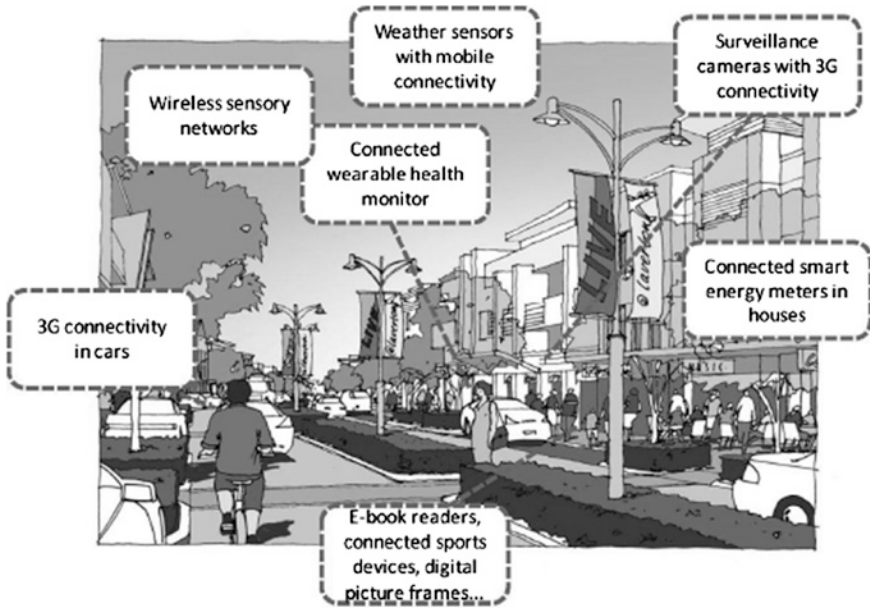


Fig. 3 Showing the concept of a smart city where citizens, objects, utilities services connect in a seamless manner using ubiquitous technologies. *Source [9]*

4.1 Use of Smart Card at the Entry Points to the City

The smart city has made a commendable progress in the field of security. The city records the identity of each person crossing the border through eye scanning and starts maintaining the database thereafter. And once the person re-enters the database is checked at the security point against the person's criminal records, outstanding fines and immigration details registered within in any emirates becomes accessible at the touch of a button.

For the people who are frequently entering and exiting the UAE can use E-Gate card which makes the passport control procedure as easy as swiping card. Emirates ID cards are soon going to replace the E-Gate cards which will be capable multiple uses and also continue to bypass the long passport control procedure at the airports. Around three passengers will be able to be processed each minute using the new system and Smart Gates—a vast improvement on the current average wait of about an hour.

At a later stage smart Gates are the second-generation 'electronic gates' in which the travellers only need to scan through the Smart Gate with their passport, Emirates ID or E-Gate card.

4.2 Emirates ID Card

The UAE national identity management infrastructure is a strategic initiative to enhance homeland security and develop a federated identity management system enabling secure E-Government transactions. A federated identity is the means of linking a person’s electronic identity and attributes, stored across multiple distinct identity management systems. Such systems would allow individuals to use the same user name, password or other personal identification as a part of the programme, the UAE issues smart identity cards for all of its population. The UAE national identity card is one of the world’s most advanced and secure smart cards. The card is provided with identification parameters stored securely in the smart chip. It thus enables establishing a person’s identity on-site (physically) and remotely (virtually), enabling secure and trusted transactions. The multi factor authentication which provides both match-on-card⁴ and match-off-card⁵ features, facilitates validation, verification and authentication of any given identity. The cardholder can then access all identity-based services sign into the networks of more than one enterprise in order to conduct transactions (Fig. 4).

The UAE ID card capabilities of on-site identification, remote identification and authentication are available and are used across the different applications enabling various forms of electronic transactions e.g. G2C and B2C these are facilitated by PIN code selected by the user. The UAE national identity management system eliminates the need to maintain distinct user credentials in separate systems and instead a single user credential can be used for multiple facilities. In an E-Government context, this has resulted in greatly simplified administration and streamlined access to resources, data verification, biometric authentication (match on card and match off card features) and digital signatures.



Fig. 4 Shows a sample of UAE national ID card. Source [1]



Fig. 5 Showing the physical urban limits of Dubai city. *Source* Dubai Strategic Plan, year 2014

4.3 Internet Access for Government Activities

As per the recent governmental strategy of Dubai, wireless internet access will become available across the city under the latest plans to turn Dubai into a ‘smart city’ (Fig. 5).

Sheikh Mohammed bin Rashid, Vice President and Ruler of Dubai, has announced a plan to increase Wi-Fi penetration across the city. The project aims to provide all Dubai residents with high-speed internet in public places, and live services and information. This Smart City project involves remote sensor devices all over Dubai. Education, health care and general security will be managed via smart systems creating a new reality for our people, a different life for our children and a new global development model. The strategic planners are studying various plans and will soon come up to the mega launch.

4.4 Use of Smart Card for Public Transportation

Since technology drives the very core of a smart city, the usage of smart devices, the smart card technology has enabled the residents of Dubai to carry a single card to reach to any destination through public transportation service. These services include the metro railway, Dubai taxi, Dubai water transport and buses. The card is available at any transportation node, supermarkets, retail shops and railway stations.

4.5 Use of Power and Water Services

The escalating scale of urban development outlined above is impacting significantly on the demand for electricity. Annual demand growth peaked in the UAE at 14.1 % in 2004, and continued to be strong in 2005 with an increase of more than 12 %. In fact, the UAE has the highest projected increase in demand within the Gulf region, which is expected to continue to grow at a minimum rate of 10 % per annum until 2010, far outstripping the world average of 3 % per annum. Plans are, therefore, being formulated to increase the UAE's electricity generation capacity by as much as 60 % by 2010.

Dubai Electricity and Water Authority (DEWA) is taking major steps in saving the resources by involving the residents in various awareness programmes. The launch of smart grid technology, smart meters for the consumption of the resources, various types of bill generations showing the consumption rate for each property and various award ceremonies for residents saving the resources are the steps taken by the E-Governments. The application which can be downloaded on mobile and internet for the payment of the water and electricity and the services charges for a property, checking the history has been introduced by DEWA. This application can also be used for various enquiries and suggestions from the public side to the E-Government [3].

4.6 Use Traffic and Transportation Services

4.6.1 Map Guidance for Commuters

Use of Geographical information system (GIS) has helped in mapping all the parcels of the urban area with all associated information such as the geographical and physical features, transportation corridors, land uses, land marks as well. All the land parcels with any land use are to be registered in the Dubai land department and with various governmental authorities and eventually the information obtained by various authorities are compiled to be reflected in a centralized mapping system available with Dubai municipality. Use of GPS in Dubai is linked with the GIS to guide a person to any corner of the city. The application has the capability to track the path of the commuter while they are on the way to their destination.

There are various measures taken by the Road and Transport Authority (RTA) to control the flow of traffic within the city. The measures include the installation of toll gates, speed checking cameras along with the design measures for the roads such as access points, road diversions on and off street parking provisions as well. The devices used to maintain the traffic are controlled by the authority and are made connected to all the commuters through internet and mobile phone apps.

The apps help to check the vehicle registration details, traffic fines, payment of toll taxes, fines and invitation of management improvement suggestions from the users.

4.6.2 Guidance in Vehicular Parking

Dubai has introduced a website to locate the parking areas within the city. The parking areas are categorized as short term and long term and the parking fee is fixed accordingly. The commuter can select the parking area as per their choice even before they start for their destination.

The payment for parking has been made easy and the commuter has been given the choice of payment

- at the parking spot by paying cash at parking metres at hourly basis,
- buy a parking card from the municipality centers and use the provision at monthly basis,
- use their mobile phones to pay the parking fees via m Parking app as described below.

The RTA has launched mParking service (mParking) which is a new value-added service that will allow motorists to pay for their virtual parking permit using their mobile phones by simply sending an SMS in a pre-defined format to a number thus eliminating the need to walk to the Payment Display (P/D) Machines and search for coins. The mParking service also alerts the motorist via an SMS prior to virtual permit expiry and if needed the motorist can extend their parking period from their office or home without having to walk to his/her vehicle.

In order to make the SMS format easy, registration will be not be required for Dubai registered private plate numbers starting with the alphabet character A-K & M whilst all other motorists who own a non-Dubai private registered plate number registration is made mandatory in order to use the mParking service. Some of the benefits of m parking are as given below [4].

- No hassle to find a parking metre and coins.
- No worries about remaining parking time, with reminder alerts via SMS.
- No need to run to buy another parking permit when your paid parking period is about to expire. Simply extend your parking period from the luxury of your office or home.

4.7 Police Service

Dubai Police has launched its official mobile application as part of the mgovernment initiative announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of UAE and ruler of Dubai earlier

this year. The Dubai Police app will provide access to various services including the followings:

- Traffic Services—Fine Payment, Traffic Clearance Certificate, Traffic Wallet and Road Status Notification.
- Security Services—Good Conduct Certificate, Police Report Inquiry, Prevent Crime, Tourist Security.
- Community Services—SOS Button, Police Leaders contact, Social Media, Pharmacies on duty, Critically ill patient service, Police Station location, Job Vacancies.
- Other Services—Appointment scheduling, News, Events Media [5].

5 Communication

Mobile phones are playing a vital role in the part of life of every residents of any country. The device has been taken into consideration for providing information and communication between the E-Governmental departments and the residents of Dubai city. Mobiles have proved to be a complete success in order to reach out to every resident and create overall transformation equation in the smart world. According to “Our Mobile Planet” Website, some interesting statistics are available to further understand the overall behaviour of Dubai’s citizens. The following statistics from “Our Mobile Planet” portray the potential success for Dubai as a smart city (Fig. 6, Tables 1 and 2).

Many government entities had already launched smartphone applications to offer their services over mobile phones and portable devices. However, the number of apps increased considerably since the launch of the mGovernment Initiative. It became necessary to guide the users about the genuine and official UAE mGovernment apps in order to facilitate them secure access to the services.

A number of government entities are currently using this service, which covers Salik (Toll Tax) recharge from RTA, payment of traffic fines from Dubai Police, payment of electricity bills from Dubai Electricity and Water Authority, payment of telephone bills and donations to various foundations as well.

To use this service, which guarantees the highest degrees of security, users must register first with their credit card details in mPay, enabling payments to be withdrawn. More details about the service and how to register make payments and SMS can be found in on the mPay website. Alternatively, iPhone users can download the mPay app from the Apple Appstore, while Android users can download from the Google Play store.

The UAE mGovernment launched the UAE’s official mGovernment App Store (www.apps.gov.ae), which is a repository of all the official mobile applications that provide UAE-Government services. The UAE is the first government to launch an official app store.

Fig. 6 Usage of smart applications by mGovernment. *Source* mGovernment, UAE, year 2014 [2]



Table 1 Smartphone usage frequency in Dubai

Device typology	Usage in (%)
Smart phone penetration rate	56
Frequency mobile internet usage via Apps	75 daily

Source mGovernment, UAE, year 2014 [2]

Table 2 Smartphone usage levels at various activity centers—Dubai

Location	Usage (%)
At home	94
At work	76
On the go	73
Café of coffee shop	72
Public transport	56

Source mGovernment, UAE, year 2014 [2]

6 Importance of Smart Applications in Dubai’s Urban Governance

As the city gains momentum in the field of development through business, trade, commercial activities, the magnetic pull for population towards the city becomes stronger. As the population starts growing, the city starts expanding physically both in horizontal and vertical directions. Decentralization of the E-Government is a practice

which is common for the developing urban areas. The main city no longer remains as the sole focal point in terms of business and hence is divided into various smaller urban centers to control a certain limit of urban activities and population around. When the city expands further the central and the subcentres need a support to maintain the network and that support is offered by smart technologies. The technologies

Table 3 List of few smart applications and practices in different sectors of Dubai

Category	Areas where smart devices introduced	Examples
Environmental improvement	Smart metres	Environment monitoring Energy billing
	Smart grid	Power distribution
	Solar panels	Power generation
Economic growth	Smart educations	Using of e books and tablets in schools as a replacement for physical books
	Green growth initiatives	Recycling of water
Cost efficiency	Replacing paperwork in government departments	Using a common and shared inter-departmental information database
	E paper work	Online applications and submission in various industrial sectors
Safety	Redirecting transport around a collision	Use of walkie talkies to receive instructions from road and transport department to the taxi drivers giving them road status information and necessary information.
	Traffic speed monitoring	Use of speed radars for vehicles and connecting to e information system for the same
	Toll tax collection for vehicles	Automatic toll tax sensors and payment
Quality of life	Feedback loops in urban panning from data across the city	Use of internet and smart devices in sending suggestions to the E-Governmental departments
Connected citizens	Transport apps for a connected commute	Use of M payment by citizens in paying the toll taxes and transport fines
Smartphones business models	Using data from smart-phones across a city to create new advertising and revenue stream for local businesses	Use of various apps by smart phones in business-related activities
Expats settling	Connected immigration clearance to bank account openings, residence search, best schools recommendations	Use of E-ID card for various government-related operations

Source Author

with the help of smart devices help in eradicating the physical presence in various government transactions. The technology binds the citizens with the E-Government for any physical size of the city through smart applications. *Source* [10].

Dubai is a growing city and is continuously showing signs of further growth in future. This is the reason that adopting smart technologies at the initial phase of growth will boost the growth of Dubai in the field of sustainability. Implementation of smart technologies in different aspects resulted in a strong network between the E-Government and the residents.

On the operational front, having smart infrastructure in place has increased the life of each property, translating into fewer upgrades, less maintenance, faster maintenance, a smaller number of maintenance staff, and fewer inspection visits. With planned maintenance programmes in place, city management has enjoyed lower costs in the long run. Centralized teams are there to work to manage the city from one command and control center. Cost savings will eventually come from needing fewer maintenance and management team members, purchasing spare parts on schedule, monitoring the city remotely, utilizing energy saving programmes and leveraging other smart innovations [6] (Table 3).

7 E-Governance in Gulf Cooperation Council (GCC) Countries

Overall, GCC countries have maintained leadership in E-Government readiness among Arab peers by taking serious steps to support the diffusion of E-Government in their societies. Several UNDP reports confirmed that the growing efforts of GCC governments to promote digital transformation and literacy have helped further enhance. Governments of the GCC countries are considered to be in intense competition with each other to develop a new knowledge-based economy, away from the current dependence on oil, and to make their products and services competitive on a global scale. GCC countries are proceeding at a rapid pace to use more service-oriented and citizen-centric operating models. This rapid reform is bringing a paradigm shift in the way citizens in the GCC are interacting with their governments. There are serious efforts in these countries to develop electronic operating environments, with advanced capabilities to build the right conditions for the E-Citizens concept to evolve [1].

8 Conclusion

The above-mentioned aspects give a picture of Dubai as a smart city through various smart applications implemented and practiced in the field of infrastructure. The booming UAE economy is further fuelling the need for infrastructure development on an unprecedented scale. This has been depicted as a 'new era of economic

transition', characterized by a public-private partnership that is gradually taking over the role traditionally held by government in infrastructure development. Housing, tourist, industrial and commercial facilities, education and healthcare amenities, transportation, utilities, communications, ports and airports are all undergoing massive redevelopment, radically altering the urban environment in the UAE [7, 8].

Dubai stands a fair chance to achieve its ambitious goals of transforming the city into the Middle East's first smart city. With the success of its E-Government initiatives and its overall popularity for its strong infrastructure and standards of living, it will achieve its goal in public sector integration, and successfully deliver its services to all residents. However, parallel the governing body should consider is how to bridge gaps between its government departments and private companies. There should be initiatives defining innovative ideas, service alignment, end-user experience, synergy between public and private sector roles and adaptation of new technologies. At the end of the day, the residents of Dubai are ready to adopt their city as a smart city.

References

1. Al-Khouri AM (2012) E-Government Strategies the case of the United Arab Emirates (UAE). <http://www.epracticejournal.eu>
2. Hamad Obaid Al Mansoori, Director General, UAE, mGovernment and Deputy Director General, Information and E-Government Sector Telecommunication, Regulatory Authority, UAE (2014) An overview of E-Government in the United Arab Emirates-2014
3. Dubai Water and Electricity Authority Data, Dubai, UAE (2014). Available at <http://www.dewa.gov.ae>
4. Road and Transport Authority Data, UAE (2014). Available at <http://www.rta.ae>
5. Dubai Police department Data 2014
6. Anthopoulos LG, Vakali A (2011) Urban planning and smart cities: interrelations and reciprocities. Springer, Berlin
7. Government of UAE (2007) United Arab Emirates year book-2007, Infrastructure. Available at www.uaeinteract.com
8. Rauf A, Enterprise Architecture, Innovation & Strategy (2013) Dubai 'smart city': are we there yet?
9. Dohler M, Vilajosana I, Vilajosana X, LLosá J, Smart cities-an action plan. Barcelona, Spain
10. A Smart Card Alliance Physical Access Council White Paper (2011) Available at <http://www.smartcardalliance.org>