

SMART URBAN PUBLIC SPACES-TOWARDS A BETTER CITY LIFE.

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Abstract

In the past, the concept of smart cities has been used extensively. Many researchers have worked on it and so much is there to talk about the way the modern-day cities are supposed to look like in the upcoming time along with smart technology applications in various aspects and fields of life and smart city-related areas. In public spaces, one of the areas in the urban spaces. It is always vital to consider that how they will produce their appearance when in major cities the smart technology is applied. The smart urban public spaces represent the use of the modernized technology and also assist in the use of spaces in the urban public. At the same time, these spaces are always expected to fulfill the rules of modern technology and architecture, the social, traditional or cultural, financial as well as ecological level of the community is also affected by it. There is a great change in the meaning as well as the functioning of smart urban public spaces in the era where interconnected via technological development. On the basis of smart and networked technological development as well as services, there are increasing facilities and opportunities for those who migrate to the cities. As a result, there is a need to further development of smart technology and smart networks in smart urban public spaces to meet the need of people living in the cities and to make smart urban public spaces attractive for the public. The essential goal of digital and smart networking in the smart urban public spaces is to enhance the use, access to public spaces. These applications also help to understand the city dwellers behavior in the better way especially in the megacities which are of great significance like Cairo. The smart technology application is shown as the way to enhance the structures of mobility, better efficiency of energy and buildings with this technology.

This paper introduces an investigate to answer some vital questions regarding the use of smart technology and how it can be used to make the smart urban public spaces better and how can one enhance the life of people living in these smart urban public spaces. A literature review is presented in this paper along with a research-based methodology, the concept of smart urban public spaces analysis, applied technologies, application and their benefit along with various other challenges. The global case study will also be explored in this paper on the smart urban public spaces, in the end; the conclusion is given by the examination of applications in Cairo along with opportunities of being a megacity, either on the smart urban public spaces current level of in the upcoming times.

Keywords: Smart cities, Urban public spaces, Smart urban spaces.

Introduction

According to the UN, the trends in world urbanization in the year 2104, 54% of the modern-day population of the world is living in cities. By the end of the year 2050, the figure is supposed to reach as much as 66%. By that

time it is expected that 80% of Europe will be urbanized and the case will be more severe in America and they are expected to reach the highest urbanization level. Due to this rapid increase in urbanization against this backdrop, the concept of smart cities is supposed to continue to keep the citizens well engaged. This offers the inhabitants a sense of belonging as well as the community. They remain also kept safe, healthy, attractive and resilient while doing so. In 2014, the report was released by the United Nations by the department of economic and social affairs.

In the various fields of life, there is rapid development such as technological development, climatic changes, social changes and development, demographics and much more, all these are pushing cities and other communities to the concept of smartness. The concept of the smart city is generally based on the forceful and much-interlinked infrastructure which is reliable as well as technical along with networks of communications which allow the development of modern application as well as services so that the needs of inhabitants and stakeholders are catered well. Conventionally, the life in cities is linked to better and superior living standards and there are more benefits and opportunities such as health, education levels, high and increased access to financial and economic stability, cultural resources and other similar facilities. (Dennis van de Meulenhof, 2015).

On the other hand, we are living in the urban development era which is driven via innovations in technology every day and in this, the key enabler will be the digital technology. The concept of smart cities is supposed to change from the building's physical network, roads and digitally connected streets with sensors of the ecosystem, power processing, and actuators, in short, we can say that all over the city there will be a digital blanket. (Dennis van de Meulenhof, 2015).

The research objectives

This research aims at clarifying the relationship between the quality of urban spaces, smart solutions, and advanced technology, in an attempt to analyze the correlation between smart solutions and quality of life and thus reach a roadmap to achieve a satisfactory level of quality using smart solutions. With the projection on the Egyptian situation.

The importance of the research

The importance of this research stems from the fact that it attempts to link smart solutions, digital technology and quality of life with urban Public Spaces. This is critically significant for all cities in the world, but it is developing into what's more important for cities in developing countries that suffer from problems in urban spaces like functional, structural problems & formality in general.

The research methodology

The research methodology will rely on the initialization of concepts in order to achieve the relationship and uncover the link between the urban spaces as a basic stock of cities and smart solutions as an influential variable. And then move on to the value analysis of both variables to reach the relationship between them. Subsequently, adopt the comparative approach and analyze the successful models to determine the implementation criteria for the interventions that can be achieved to convert a traditional or typical urban space to another intelligent.

A hypothesis of the research

The quality and performance of services in the city are supposed to be enhanced via technological development in the field of communication and information. But just what does 'Smartness' mean and how it can be actualized is the key question, in addition to the question of smartness add to the quality of our urban public spaces or not.

What is the public space?

A public space which is generally open and fully accessible to the people there is known as a public space. It includes many components like roads, pavements, public parks and gardens, public squares and beaches, etc. all these areas are typically considered as public spaces. There are some governments based also accessible buildings to some extent for the public such as libraries are considered as an important public area though they tend to have some limited access areas and on use. Privately owned buildings are not considered as public spaces and in the same way, the property which by sidewalks is visible along with the public and supposed thoroughfares to include an impact on the public visual landscape such as advertising outdoors. In the recent past, the shared space concept has been used in its progressive forms to increase the pedestrian's experience in the public spaces jointly the use of motor vehicles and other ways of transportations. (Nadezda Kuzilenkova, 2016)

In relation to philosophy, urban geography, visual art, cultural studies, social studies and urban design the public space has also transformed into something of a touchstone for critical theory. In this way, the public space term is mostly not constructed well to indicate the presence of other factors like places of gathering which is considered as a critical element for the social space and its more difficult concept. There are some familiar examples of public spaces as the most primary example whereby for entry there is no need to pay paid tickets or entry fee. The nongovernment-owned malls are considered as private-public place examples which produce their appearance in being massive spaces occupied by the public. (Nadezda Kuzilenkova, 2016)



Figure 1 a public space is a place that is generally open and accessible to people.

The city needs a public urban space.

There is more capability in cities to offer something to everyone who wants to represent a part of it, only because they are made or developed by everyone. Jane Jacobs mentioned in his book that urban spaces affect our physical, behavioral and emotional well-being in the book named *Death and Life of Great American Cities*. How we behave every day and becoming aware of it we know it all alone in contrast to when in the similar situations we are brought like street arts, public installations, markets and other public festivals. (Jane Jacobs, 1961)

Urban areas provide the capability of allowing a brief comment, simply because and just when they are made by everyone. As specified by Jane Jacobs, in his book *The Death and Life of Great American Cities*. Urban spaces influence our physical, mental, and enthusiastic prosperity. Getting to be mindful of how we carry on in ordinary situations when we are united in circumstances like open establishments, road craftsmanship, celebrations, markets, etc. (Jane Jacobs, 2001)

Importance of urban public spaces.

Generally speaking, there are specific criteria for determining public space. A public space is a place that is accessible to the public at any time of day, such as parks, beaches, squares, roads, sidewalks, etc. such public spaces are supposed to perform various functions and in spatial terms, they can easily be seen. They can be

turned into lively yet with the community effort along with the creation of spaces which can introduce the public together. (yang Lisa, 2015).

Public spaces are always precious because of the following significant reasons which are mentioned below:-

- **Benefits of human health.**

In the larger of megacities, there is an urgent need to make concrete jungle, relaxing public spaces such as parks and gardens with the cool and calm atmosphere so that people. When they examine such places, approach a time to relax and decompress their stress and get a little break from their hectic mode of life at the workplaces and home, in achieving this they also get rid of stress and feel more active physically. Public parks and gardens offer the sources of also helpful greenery to minimize the negative effect of pollution as they control the climate as well making it more pleasant and suitable for mortal life. Central Park in New York City is one of the most well-known public parks and in the same way in Vancouver the Stanley Park, Montreal has Mount Royal Park and in London, there is a Hyde Park. (Yang Lisa, 2015)

- **Building a sense of community, civic identity and culture.**

Communities are not built by public spaces; there are some citizens however who allow an active part in the creation of community building and likewise activities not exclusively promote a livelier community but also make it a better living place, they also help to make a project for the public spaces and effective processes which on the asset of local community capitalizes and have further potential and capability to establish the life of people better in providing health, happiness, and wellbeing. In this way, we can say that people can be attracted to come together in the successful smart public spaces and can allow an interaction with each other. We can have a little comparison here, a spacious and full park of greenery and birds to the open area with heaps of unconsidered garbage as a suitable utilization of a broad space. A community can be created at any place, but there is always a need to make this community attractive and open space much pleasant so that people can consume time together. (Yang Lisa, 2015).

- **Driving economic growth.**

We can consider the example of Montreal's Place Des Arts Esplanade where people come in hundreds of thousands from all across the globe. They examine this area to take part in festivals which take place in this particular area. Other such areas are open markets for public and there are shared spaces which drive more and more traffic benefiting the local business owners and another local economy via sales and taxes and this also increases the job opportunities. In the year 2002, in the public services project, almost 800 customers were surveyed from around the country from a variety of indoor and open-air markets. It was discovered by PPS for the market shoppers in about 800 customers keep themselves engaged. 60% of market shoppers visited nearby stores as discovered by PPS visit the stores nearby on the same day; they also visited the additional stores on that day and the number of such people was 60% the days when they explored a particular market. (Yang Lisa, 2015).

- **Transforming wasted space.**

TED talk mentions that how cities are made to work in public spaces? According to the former director of the city planning department of New York City, Amanda Burden, he offered the example of a waterfront degraded in the surroundings of Green points and in Brooklyn the Williamsburg. It is not possible to access the waterfront as it was abandoned. As a result, little economic activity and little to no traffic were there. In this lovely city, it was a waste of such an open space. A project was given to the group of architects, and it was transformed beautifully into the public place with a waterfront with tree-lined paths and green parks. Space thrives today and nowadays it has a superb system of transportation which successfully runs all over it. From this example, the lesson is drawn, and this reflects that when you are creating a space to invite, people will definitely come. (Yang Lisa, 2015).

City character and enhancing architectural diversity.

In the urban environments particularly, the critical choice of building material is concrete and skyscrapers reign, along with a color dash, an attraction of a community or installation of public art is likely to make a considerable difference in the environment of the city. In New York City, if you consider Bryant Park, in the Manhattan's middle urban park, it is considered as an easy and convenient employee pace and most of the tourists like to take some breaks at this part and consume time in the colorful flowers and marked paths with dense trees. A city can even be livening up by the art installation. For this, we can consider an example of the enormously popular Luminothérapie exhibition, which has taken place every year as an interactive place at Art in Des Art Montreal, until now from here in there in Winnipeg, or Yue Minjun's A-Maze-Ing Laughter in Morton Park, Vancouver. The landscape of the city is not only complimented by such installations but these art exhibitions also hearten people to communicate more with each other and the piece of art become a topic for such interactions. (Yang Lisa, 2015).

The Difference between a 'Public Space' and a 'Common'

Those who explicitly compromise and some who share resources implicitly in the modern community overall is always a fascinating aspect whereby the areas of cities also show their interest. These at the minimum are inclusive of streets inside a community, the sideways walks, and other public facilities and along with this some other factors is there which include a scenic vista, the characters of the architect, and resources inside the environment. In Massachusetts, the most familiar and famous park of the city is known as common Boston due to this. Of shared interest these places are critical, and they are significant to the environment in cities which is supposed to be natural and need to be protected and improve. In actual we can debate the other commons which ultimately become the symbol of identification for the local community and we are all knitted together with this. (Kaid Benfield, 2013).

The Environmental Commons

Commons in the world of the environment represent the points which refer to the things tangible in the world which is all nature around us, this not only includes the individual owned parties and are likely to have an interest. Talking about the larger scale, global commons are also included in it and the introduction of the first phase to me by the Jacob Scherr: the example of it can be given as the ocean ecosystem, the ecosystems of the polar ice caps, endangered species of animals birds and plants, atmosphere and another internationally significant land and the ecosystems of riparian. Over the governance, in the worldwide commons, there has been a great establishment. If via conventions and international treaties, as CITIES, and the endangered species list can be established. This includes enforcement of worldwide agreements which in most of the cases are problematic. Water bodies are included in environmental commons along with domestically related ecosystems like the Chesapeake Bay or Great Lake; the land of public use which includes national parks along with municipal parks at the level of a state or a town with the pure air so that we can breathe better. One of the particular reasons behind many health concerns in the urban areas is pollution which is albeit a negative one. (Kaid Benfield, 2013), the federal laws, local and state complex systems govern these interests.

It is important to note that critically that a resource is not supposed to be owned by a public but it should be considered as a part of common. In the sustained production, we all have an interest in the well-managed forests along with innovations in the field of agriculture. The example of it can be taken as even the forestland in vast portions and private owned farmlands.

Which are in the field of advocacy of the environment and also its infancy in the past few days, public environmental commons arise in the situations whereby the local government was not able to do it and they were unwilling too? It will remain forever as a logical response or direct response to the common's tragedy whereby the individual's interest is seen which when left to go unchecked will ultimately deplete the negative resources on which depends is the larger interest of the public. (Kaid Benfield, 2013)

The Urban Commons

The bit of environmental philosophy can be related as there are limited commons to the found resources in the naturally existing world. The sort's ecology is there which pertains to the settlement of mortal life and habitat of people and in this way, they are seen distinct from each other and also they are analogous to the ideal habitat and their ecology. The habitat of people includes the built environment fundamentally. In this ecosystem of the natural environment or habitat, the main concern is the re-health of the system, and habitat of people is concerned mainly with the human communities and their health aspects.

According to the definition, the traditional habitat for the people is typically seen in the urban or city areas, like suburbs and towns in the more global cities. In this case more than half of the world that is considered as four fifths of the US people residing. In our public and generally shared spaces, the most visible indication is visible in the streets, parks, markets either indoor or outdoor, public libraries, waterway, academic institutions and transport means, courts and other similar public spaces with many public gathering. In this are included the privately owned museums and other sites which are of great significance from the public point of view such as a church or mosque, etc., cultural venue, sports, open to public campuses of certain universities. (Kaid Benfield, 2013)

What is smart urban space?

The themes for smart urban spaces in the public spaces look in the cities as the parts where so many things come together physically. For multiple functions, it offers spaces and other activities which host the solutions of traffic and also allow the management of waste and solutions regarding it along with an infrastructure based on ICT. For the perception of safety and security, atmosphere and life quality the public space is important in the same way the atmosphere and life quality inside a city is, in addition, a major concern. There is a need for enabling social cohesions or attachments in the residents of cities. In the exceptional events the public lighting is regarded as the energy consumption source but at the same time, it offers ICT based creative opportunities and solutions. In the smart urban space filed the aim or involved partners is to develop the smart urban spaces roadmap. The roadmap like this there is more options to actualize the expected scenarios of the future in the principal and explored cities. To collect information on the technological options, the desk study will be done. Industrial experts, educational institution workers and another outstanding worker in the government based institutions will be invited to contribute to their views on the workshops to find out the possibilities in the future. In the process of the roadmap, the organizations will be invited explicitly.

To design the system of roadmaps via networks in the cities, the local companies will be sent invitations to participate. On the sustainable technologies, the focus will be kept along with the sustainability inside an organization and sustainable behavior to actualize the aims in spaces of ambitious cities and also the energy sustainability in the external and public spaces. Change in the meeting has been experienced by the public open urban areas in the technological development age and relative interconnectivity. On the basis of smart development in the field of the technology and another service along with opportunities which have enhanced an essential aspect for those who are living in the cities. Significant information can be collected with the help of this technology and ultimately it is used to check out and experiment the pilot projects of cities. (Roadmaps for energy report, 2018)

Smart connectivity for public spaces

The cities of the future are faced with the challenge of improving the quality of life for their city dwellers, particularly in the context of increasing urbanization. Public space plays an essential role here and has, therefore, become a priority topic within urban planning circles.

Objective

The essential goal of smart networking based on the digital technology of the open public space is not only aimed to make the accessibility and usage better and to increase the aesthetics of the public space, it can also help in a better understanding of the behavioral aspects of those living in major cities. This also allows the dynamic data collection which also includes information regarding mobility behavior, pedestrian, environmental data, etc. for the more isolated development of smart networking in the open public areas the continuous evaluation can serve as a basis and it also allows fulfilling the demands of city inhabitants and also the attractiveness of public spaces is increased. (Nora D. Fender, n. d.)

Major opportunities for new technologies

For the development of smart technological solutions, the public spaces offer creative opportunities as the innovative platforms. In this way, the inhabitants of the modern and megacities get more opportunities to understand better and shape actively their spaces which are open to the public. (Nora D. Fandlr, n. d.)

Sustainability

Smart module systems with the help of innovative technologies along with smarter module system are likely to make their own energy making use of solar power which is generally characterized by the exceptionally high efficiency. Social added values compliment it and significant improvements can be made with the help of such interventions to make the open spaces sustainability better and superior.

Modular offer

The smarter and modern innovative technologies also offer many uses as a potential. The technological modularity also enables the coupling of core modules along with modules to expand and adapt the need of the cities accordingly. (Nora D. Fandlr, n. d.)

Smart Urban Space

The focus on the application area

The smart urban space application zone underscores an all-encompassing methodology on economical answers for open spaces, incorporating different capacities to enhance personal satisfaction. These difficulties incorporate, the dynamic utilization of open space by residents as a feature of their living condition, and empowering wellbeing and essentialness (counting physical, mental and passionate, and the effect of physical movement, exercise, sustenance and rest designs), spatial equity and open utilize, waste and asset administration (counting roundabout frameworks that add to a brilliant utilization of assets), and atmosphere flexibility (e.g. rain water administration and warmth stretch). (Punit Sethi, 2017)

Desired solution spaces include:

- For all the people living inside the cities, a pleasant and multifunctional environment which is secure and in this way preserving the city's cultural and traditional identity.
- Making some prominent steps in order to progress in the field of urban health in the capital cities, this helps to improve the expectancy of life and in the same way; it can also reduce or diminish the differences in quality of life and its expectancy.
- Infrastructures and other greener spaces for the public which is a source of calmness and lead to a healthy lifestyle along with better communication inside the society.
- For both public and private spaces the integration of urban planning to contribute to the resilience of climate.
- Management of rainwater as a key part of this system to offer flood protection and also to make sure that a critical resource named water represent a presence.

- The interlinked areas in urban and rural areas along with the stable economy in the locality along with resource's circular flow to ensure the more valuable and superior quality of life in major cities of the world.
- A grid-based facilitates secure, smarter and resilient framework along with data which is based on real-time is seen to motivate and increase the quality of services in urban areas of the world.
- On the basis of access to data, the innovative model of business especially services with collaboration and financing in the creative forms.
- Facilitation of every day and active lifestyle with the help of contextual and personal integration based on either physical or socio-economic environment along with various factors of technological advancements to grow and optimize the systems of personal development and complex health.
- Keeping the climate of outdoor health and these include the sound, air quality, and wind quality, etc.
- The food production solutions, cities urban farming is there, and this is to fulfill the needs of more population and their demands and this ultimately is due to the increased awareness regarding the sustainability of food styles, health aspects and security of food along with the life quality inside the external green spaces. (Punit Sethi, 2017)

Active Public Space

In the European Union, it is seen that over 70% of the citizens are residing in cities or urban areas. These mega-cities are considered the hub for the services, financial development, knowledge seeking and innovation, etc. Seoul has a public space inside it where people from the various social group come and interact. The area is regarded as a zone of interconnection and overlapping; it is regarded as a place where materialization of culture and society takes place. If in any case the general population space we possess today was essentially built earlier or amid the Industrial Revolution, the Information Society is currently starting to carry new standards and growths with which to reevaluate the working and structure of the boulevards, roads, squares, and parks. Public space would now be able to be changed in Active Public Space, encouraging individuals association with streams of vitality, materials, administrations, and accounts to catalyze maintainable monetary improvement, versatility and high caliber of life. Smart urban technologies represent fundamentals for the change and comprise on a mix of programming and equipment that permit constant information catch, vitality age, stockpiling and reuse, material flexibility, continuous administration of time-uses and national space communication. (Creative Europe Programme EU, 2015)



Figure 2 UN World Urbanization Trends, 2014 APS (Active Public Space) is an EU Co-funded project with the aim of developing knowledge on Active Public Space.

Project objectives

In implementing the sustainable urban development we can increase the role of architecture which is quite integrating and innovating. Exchange of knowledge forecasting and the most adequate possible measures in the smart urban technology application so that the active spaces are created via the transformation of remaining public spaces. This can contribute a great deal to bridge the skills which are existing and also the gaps in the use of technology in smart urban architects and urban planners can develop the use of such applications. This can ultimately result in enhancing the participation of the city in the EU's sustainable development of urban areas.

For the European architecture, the visibility increase along with the urban spaces can result in much of awareness inside the public and architecture can play an essential role when we talk about the urban sustainable development in the mega cities. (Creative Europe Programme EU, 2015)

Project activities

By the collecting and publication of the European active spaces for public in the state of art technology, a workshop was developed in Barcelona, Prague and Vienna which was basically aimed to offer architects and other planners for urban areas who are skilled enough regarding the use of smart technology in urban areas and they are able to share their knowledge and good practices and also with the participation of people of the city they can experiment with such the technology in order to provide sustainable urban development and likewise processes. "How to implement urban smart technologies Guide" is an online publication; the three urban installation organizations are part of it. For the sustainable urban development, the participation of the citizen will be put at the service. When a major symposium is implemented to present the result of the projects among the representatives selected globally which include both architects and planners of the cities. On the best practices and learned experiences, the coproduction of a touring exhibition took place in some cities where the wide-reaching program of dissemination took place in these cities, the aim was to increase the role of European architecture and visibility of their role in the sustainable urban development and how it can more substantially be enhanced. The cities which took part in this were Barcelona, Prague, Vienna, London, and Copenhagen. (Creative Europe Programme EU, 2015)

The importance of smart urban public spaces

The smartness is a concept which has several important components which are mentioned below:

A- User experience feedback:

It is a study regarding the citizen movement and related habit and sharing of their personal experiences. The mobility of pedestrians especially those who are disabled which are regarded as the most vulnerable group of people. The information gathered is likely to improve enormously in representing any particular decision to improve the features of such pavements so that people can walk easily and make them more accessible to a more significant number of people especially the disabled ones. The gathered information is also given to the customers to make the high accessibility of public areas which can affect the decision of not going to any particular open public space due to limited accessibility.

B- Data accessibility and personalization:

In the world of perfection, no individuals will be overpowered by the measures of unreasonable data which doesn't exist in reality. No undistinguishable recipients will be there for the telecommunication nonpartisan and due to this the opposite arrangements to it are likely to happen like a programming brilliance for the sake of collecting channel data. In the modern days, such applications are becoming much typical, and we can clearly regard them around, with the level of control shift and from the proposition of Amazon on the likely purchases to be made in the upcoming times, it can either by anything recommended by Facebook, occasions, communications, and gatherings or any sort of social communication networking with the help of Google to the newly customized maps. A warning character is there in some of them on another hand the channel data has to the goal which is to be achieved by a user. Surrounding knowledge and the result all fate is likely to suggest that to get pre-chosen data we get a chance by calculations and their handling which can be altered to the identity.

The end goal is supposed to be kept in a mind so that some impacts which are conceivable for the connection with open space state are there. We can also see the Google, customized maps in this case. There is an improvement in the Google Maps and also they allow a guide which is one of the kinds for anyone constantly adjusts to the errand you need to perform right this moment. "The features of it are shown in this way which

straightforwardly is accepted as they are linked with the hunt. On the guide, each tap offers another level of customization which represents a way to change quickly to feature data which is most concerning. With the help of a guide, the results and record are made better with the data of your quest. In this way, the Google is able to make or construct simply more helpful maps with appreciable data and places in the profile view.

The difference between urban public space and smart urban public space:

	Urban public space	Smart urban public space
Accessibility/connected	Physically only	Physically and digitally
Visually attractive	yes	Yes, and VR can add to it
Eco-friendly	According to city governance	Mostly Eco-friendly
Sociable	Yes	Yes
Inclusive	Yes	Yes
Management	governmental, rigid	collaborative, adaptive
Event coordination	regulated, time-consuming	Spur of the moment,
User experience feedback	Manual surveys, infrequent	Digital surveys, at the moment
Interaction with space	Limited	Vast, evolving

Table 1 showing the difference between Urban public space & Smart Urban Public Space(Surabhi Pancholi, Tan Yigitcanlar and Mirko Guaralda, 2015)

The effect of smartness on urban public spaces

The vital goal of public spaces and their smart digital networking is to enhance their utilization and accessibility by increasing the public space’s aesthetics. This can help the city dwellers to move to such places and also they can collect the dynamic information regarding a particular place such as the data regarding environment, city dwellers behavior, mobility, and pedestrians, etc. for the more isolated development of smart spaces for networking in the public and this is done to establish the public places more attractive to gather the public. When innovative technologies are used, the systems of smart modules are likely to generate their own energy which traditionally represents solar energy containing the higher rate of efficiency. Socially added values compliment it and these are the types of likely intervention to make more enhancements for the sustainability of open urban public areas. (PÉREZ-DELHOYO et al., 2017)

Urban metabolism

The metabolism of city areas can be utilized as an apparatus to screen material streams and enhance the metabolic impression (asset sources of information and waste yields) to diminish a biological effect while enhancing bearableness. Like living beings, diverse city communities allow distinctive systems of metabolism. Examination of a point by point contextual analysis in Perth demonstrates that diverse parts of a city (strolling, travel and vehicle cities textures) additionally have distinctive cities systems of metabolism. The cities system of metabolism investigation is basic for distinguishing cities outline use focuses that will allow the change of Australian cities areas from a portion of the world’s most assets escalated to feasible cities communities. A keen city, hence, is one that measures material streams and makes this information broadly accessible as data streams to those individuals who can impact cities results. Cities a system of metabolism can advise to prove based approaches to streamline practical cities plans. (Giles Thomson, 2016)

Application tools to make public spaces smarter

The term smart means various innovative features as highlighted and also linked with, yet it is more feasible and securer, the features are more appealing as well. Consider, for example, a city where the government is spending to produce improvement in the adjustment of urban communities. To enhance the administration of communities in cities, the going for mechanical advancement offers a senior level of personal and social satisfaction to the people residing in these communities. By some neighborhood organizations, this is a heading taken in Europe which represents the beginning of new assertions setting and undertakings to establish the urban areas develop smartly. As settled by European Union, in the connection of destinations the upheld arrangements are some sort of taken responsibilities as formal and all the communities inside cities with these

changed procedures are linked and in various courses in the smart urban areas, these should reverse them. (Sanseverino et al. 2014).

Incorporating subject interest as a genuine piece of shrewd urban areas strategy at all levels of choice and usage is a principle aspiration of The European Innovation Partnership on Smart Cities and Communities. In the areas of urban units, the supposed subjects to establish the urban life better and enhance industry through coordinated arrangements made reasonably. (European Commission, 2015). From the training when it ascends, the smart city is a do technique in particular; it is a collection of some tasks and important activities which are open and sometimes private in the forms of associations. As a result of such activities and tasks, the unconstrained decisions and they're after effects by various performers are contingent upon some benefits in addition to a specific smart city, extremely heterogeneous accumulations are obtained. For planning of definition by keeping an eye on the contextual researches and investigations to make up the portraying definition for a smart city, in particular, is not a standard. (Hollands, 2008).

The fast advancement of current data and correspondence advances (ICTs) guarantees to change urban Governance into savvy city administration since these ICTs empower city governments to complete their assignments all the more successfully and proficiently (bury alia Walravens, 2012; Hoon et al., 2013). The more significant part of savvy urban communities depends on an exceptionally solid digitalization of administrations for the tenants and every other partner. In this issue, shrewd networks are comprehended as a gathering of related human-digital physical frameworks, where ICT speaks to the detecting and activating digital foundation to gauge the condition of human and physical frameworks and help with adjusting/changing these frameworks (Nahrstedt et al.2016).

Wi-Fi services in public places can be a feature to attract differently and more users to sites leading to greater use of these spaces. Bringing more people outdoors can make public space more alive, deserted places can be revived. More people also improve the safety of the places and can mean diversity, thus contributing to reduce social inequalities and to increase cohesion and tolerance. Since participating in real and virtual spaces can contribute to the public discourse, which in turn can stimulate political action and develop more democracy. At the same time, it is possible none of these will happen, as the internet and ICT may prevent existing public life making private activities in public spaces shrink or diminish. The availability of Wi-Fi hotspots does not mean necessarily the access to information is more unlimited or the dissemination and diversity of ideas increase (sHamptonet. al. 2009).

Wi-Fi reaching public spaces is already challenging designers and landscape architects to focus on the needs of people living in an increasingly united world. The Wi-Fi hotspots do not require only new signs to inform the existences but for developing the use of ICT and mobile devises outdoors more comfortable already new street furniture is being designed. This new furniture could have the further influenced on the urban landscape. In Paris, six various kinds of intelligent street furniture are being already tested. This includes the Digital Harbor, a kind of open kiosk with a plant replaced roof, equipped with swivel seats and tabletops designed for laptop computers. It offers free Wi-Fi connection and recharging points for electronic devices. In Belgrade, users of the Tašmajdan Park can recharge the batteries of mobile phones, tablets, and multimedia devices with solar energy. Solar powered benches are planned to be installed in Boston offering similar services. (Costa and Erjavec, 2015)

Application tools examples

Improving urban accessibility

Through the accessibility of cities and the system of monitoring which is based on the analysis of dynamics, for example, the study related to the citizen and their movement habits along with their experiences and

information is important. In particular, the work is more focused on the mobility of the pedestrian especially in the vulnerable group which according to the report is the group of people with certain disabilities.

As a result of an integrated system and is specially designed, the following aspects are covered in it which includes the information gathering which means to receive the information regarding the location of people in the cities as well as their experiences. In the second step, the information which is collected is structured and stored and in the end the gathering, contrasting and analysis are done on the movement of a citizen and their flow trends. (PÉREZ-DELHOYO et al., 2017).

The automatic reading of the locations of the citizen is also added to the system which provides the basis for this system. Individual locations are obtained continuously via technologies like RFID and GPS. The RFID tags contents and locations of GPS are also seen to be obtained by the devices acquisition. The application, furthermore, is also designed explicitly for the cell phone devices which allow users to report the real-time experience of their own. Sending comments and photos and posting of anonymous posts is also possible through these apps. The implementation of the architecture of the city and its accessibility can be analyzed, and an information location service in the global system of architecture is also centralized. The information service regarding the accessibility of services is also supported with the help of Enterprise Bus services known as infrastructure ESB integration.

There are two ways via which the outcomes are shown: as per business to customer paradigm which is represented as B2C the interaction of users is allowed as well and the consumers are able to connect in B2C making use of websites and other services at the web for the improvement of making decisions. To supervise specific areas of cities both protocols can define the search related filters. (PÉREZ-DELHOYO et al., 2017)

When the system receives an information search, it undertakes the process of inference consisting of the following steps:

1. The information regarding the location of citizens which is completely structured to make up the flow of movements of citizens.
2. The analysis of the classification module in the flow of the citizen and routes which are generalized can be identified and also the patterns of behavior are classified based on the disability and its kind. In order to make it done the types of disability are supposed to be aided by the disabled people.
3. The citizen flow module regarding comparison is made and processed by these patterns which are to contrast the paths which citizen use if they experience or don't experience any particular disability. In the end, the addition is finalized, and it is the data of the people of cities which they experience on the designed applications at their personalized gadgets such as cell phones.

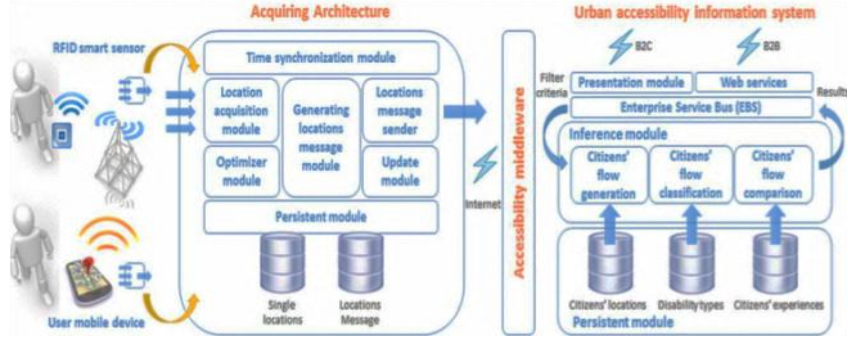


Figure 3 Application tools examples, the consumers are able to connect in B2C making use of websites and other services at the web

A specific method was based on the dynamics of the city and its analysis and also it ensures the effective accessibility estimation in the environment of cities and maintenance of control with the passage of time with a proper system.

In representing any decision regarding the improvement in actions to prioritize the public paces the suggested system offers significant support. The collection, record, and estimation of the spatial information are done and accessibility of the true state is also recorded an estimated. From the cities operation itself, these are all accomplished by the included mechanism to offer people with disabilities some voice. The obtained data also allows the excellence and superior designs for the mobility of pedestrians in the city. (PÉREZ-DELHOYO et al., 2017)

Augmented reality

One of the most immediate forms which are identifiable in the real argument is the presence of screens in the physical spaces, two units atoms and bits there are other ways as well which include the presence of networks which are wireless as a mean of communication and in general more association is seen in between the electronic resources and spatial sequences which are the ubiquitous computing origin. The time when virtual was opposed to the real has a phone and now to stability, it seems to threaten. The banal is seen in between the linkage of atoms and bits and aims are also referred by it which includes the civilized projects as to make up the valuable data for the public, the educational series and commercial movies without mentioning the arguments which contributed in the reality to make the complex system control including the scientific investigations. On the fixed and mobile screen although the range of information is displayed also from the terminals of digitalized gadgets which municipalities have installed in the towns which include urban flow panels in the link New York City and Helsinki to the smart cell phones and users are enriched via then by the immediate environment interpretation and the to transform the public spaces the argument indeed has begun to show variations inside the open public spaces. It also offers the application of tourism-related arrays in wide ranges such as in the town of Cluny in Burgundy a few years ago the Eastern parts of France used to screen the trails allowing the movers to walk around the ruins of their abbey church in order to see the building Romanesque on their way to Heyday. (Antoine Picon, 2015)

Augment reality as a method to impose biophilia

Biophilia is defined as being “the inherent human inclination to affiliate with nature” with no physical or tangible link to the nature of living systems some biophilia effects can be obtained. In the living systems or nature, the indirect experiences also include representation of nature artistically and virtual reality virtual and nature’s other illusions are also likely to be formed in order to make the responses which are psychophysiological as well as biophilic. (Philip Roos et al., 2016)

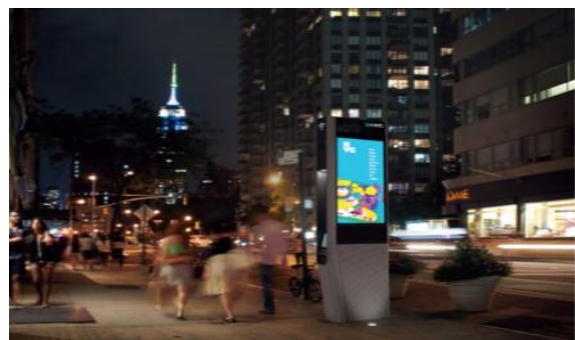


Figure 4 Augmented reality for the visitors so that they can see the church as it used to be before it was destroyed.

The reconstruction of the Church of Cluny in the area of France named Burgundy is shown in the augmented reality terminals in the year 2011. In the same church, the Romanesque buildings for churches were also constructed which at the beginning of the 19th century were destroyed. Arts et Métiers ParisTech attend the engineering school which cooperated in the city of Cluny which was tested for the use of terminals based on augmented reality for the visitors so that they can recognize the church as it used to be before it was destroyed. (Antoine Picon, 2015)

Link New York City experimented which was a link or point to the city of New York in the year 2014 which was generally aimed to the networking aging for the city's telephone pay by Links, the points of iconic construction will offer wireless technology for the communication. As a result of this people will be able to make free phone calls all around the US and also touchscreen tablets will be given to them with the modern interface and digitalized displays for announcements of public services as well as advertising. (Antoine Picon, 2015)

Interactive reality

Example:

The extent to which the reality which has intervened has tremendously altered the cities design and desire to transform it is also implied with the help of Pokemon Go along with the fanciful layering over reality in the called genuine world and the harries potter's wizarding world which is abbreviated as WWoHP at the worldwide stops of amusement in main cities such as Florida where once obtained an infrared reflector supporting a wand at the upper edge along with can wave at the want at pre-defined spots in the specific movements and infrared triggers are there to control along with the prowl recipients, some sort of impact is delivered with these lines such as in a shop window open up making a book and its dim facts uncovering which are located inside it. To pour the water down the outwardly used umbrella or ink when it is undetectable to itself cover on some sort of parchments (Varnelis, Kazys, 2016 Design after the Event Horizon—in Volume #49: Hello World! September). A model for the future conscious city is possibly made by him and the demonstration can, however, be given if at all there is a desire of doing some things. The exiting method is used to later the quiet generally sensor based the environment which is parched with the possible impact of cities. The ending is there in a vision whereby the city natives are supposed to face biophilia from the surge of wilderness and thereby gardens are thickly blossoming or cascade outland as a city piece and produced all such things making use of computer technology is fanciful. Philip Roos et al., 2016)

The codes for rapid or quick response are seen to be on items and in-store buildings as we see around. With the help of cell phones, these can additionally be checked for additional or extra information such as selecting of a particular challenge or making use of any coupon. For the landscape architect, the San Francisco for the project of CMG is also seen to obtain a combined effort by many architects working for MRY. With the realistic nature of QR codes, they are seen as intriguing as a conceivably clear design for their own ventures at the UC Berkeley Lower Sprout Plaza, which represent a free-speech organization. (Amanda Walter, 2011)

To check the capability, the codes are regarded as noticeable in the encompassing structure from the maps such as Google Earth. To the quicker advancements in innovation, this is a good gesture with quick speed as well. As per proprietor of an organization named Willet Moss says, "I like that the innovation would wind updated, much the same as the mid-century structures that encompass it, yet the example would at present capacity, just, as a clearing design. A substance can be given a foundation data when it got through the codes on any specific site and it can be used for the purpose of business and also it underlines the proprietors' essential squares.



Figure 5 Buildings now includes QR codes on all of its posted construction and electrical permits—making all the information about the construction, from the site manager's phone number to the contractor's prior violations, available to anyone with a smartphone. (Smart Phones and Public Spaces, 2014), In Seoul, Korea, QR

codes are at each of the city's bus stops. Users who scan the code obtain access to real-time information on services and schedules, even the location of the bus itself. The City of New York's Department

The QR used codes can additionally be connected to the building plans such as N working close in the building veneers at the station of Tachikawa in the town of Japan by tera Design Company as well as Qosmio. The contrasting or comparing option was also given, and it was to issue the announcements publicly to attract masses and outlines of the MVRDV's being to make a working which was neglected in the France Dijon and with a secured QR exterior. (Amanda Walter, 2011)

Location-based technology

The innovation which is based on the area in the streams of broadcasters and applicable to the sound substance to where the targeted audience can listen right to them is made. The client's record is listed down, and it is a sound and shared substance online especially via tablets, and smart gadgets like computers, versatile cell phones, etc. a fellow benefactor and Broadcasting CEO named Andy Hunter says that "Story and place have dependably been personally associated. Fashioners recognize this superior to most likely any other individual. By utilizing sound, Broadcast delivers you a chance to get to data about the world without hauling you out of it your hands and eyes are free."

We can consider an example that if the stories were contributed by the Bryant Park Corporation on the broadcaster regarding the town square at Manhattan, a Bryant Park represent the place where a client strolls through an also for the foundation they can tune into for the creation of centers on the well-known seats in the centers for recreation, this is about the program of Yoga every Thursday night even a form of the anecdote regarding the center of recreation which on instructive vegetation garden is facilitated to make it possible for the residents of New York to make their own food during the time of the supreme world war. (Amanda Walter, 2011)

Opportunities to make an urban public space smart

Smart crowd control for Kyoto station deployment as a Case Study:

The smart public areas the cities and their arrangement for spaces is a significant testing, it is always hard to link it with sensors to the guests included in the site inside the spaces, it is equally likely to lose or Un gain or even reject the application or request that they have the ability to take some interest in tests. Along with this, the difficulty is there to close the guests in the spaces around so that they keep this in mind that the ending aim is to make it possible for different tires of things by the member's consideration.

In excess of 300,000 travelers go through Kyoto station, the principal railroad station in Kyoto City, consistently. In this station, we introduced a direction framework that tracks travelers to help their route in light of their present positions (Nakanishi et al.,2004). Past customary route frameworks, which latently exhibit course data, the framework proactively sends guidelines to the people's cell phones to control their courses and stay away from the clog. The framework's essential application is jam control in crisis situations. (Toru Ishida and Satoshi Koizumi, 2008)

Financial estimations of shrewd Urban Public space

1-Adaptability = reserve funds

Massachusetts, 2014 the bridge boarding for the downtown transport was accomplished. The transport and its customary translation of the cities framework system are that by various administrations it is tested and verified. Boston-territory Bridj transports are the example of it. The courses of it don't take after the examples of testing settlements, on the other hand, they adjust the particular rhythm of the city by accepting the request of clients via mining of information which can be obtained at the cell phones with a modern interface. There is a continuous adjustment of timetables to make their clients satisfied by offering them the essential needs along with possible information to the gathered suburbanite ventures from the ending positions.

The LinkedIn, Google Earth, Twitter, Facebook, and Foursquare are also after gaining entry into the coveted takeoff and on the cell phone applications, the entry is typically focused. The clients of Bridj are also given the opportunity to get and their focus can be dropped off. On the other hand the mining informational measures and making of the possible and accurate outcomes which are conceivable as well for the association remain the key with users who with cell phones are offered and the framework of transportation along with their creators are currently investigating the modernized and latest headings which can prompt the settlements and they are likely to be more adaptive as compared to the conventional frameworks. (Antoine Picon, 2015)

2- Real-time updates = Faster intervention in case of crisis

The mapping is allowed by it and it is becoming more dynamic and updatable which either on demand and automatically zoomed or able to be clicked inside the interactive word. The new cybernetics and control rooms the simulation-based programs are inspired by this project of smart cities and before our very eyes they are emerging, for example, the maps which are allowed to keep and maintain the tracks, in the real time in most of the cases regarding the things which in technological systems are happening and they also include power grids, the systems of water hygiene and sanitation, networks of roads and transportation to public. what visibly happens to render to it, they are also seen to be linked to the panels for control and also they allow the operators to show some intervention to regulate and solve the situational crises. (Antoine Picon, 2015)



Figure 6 The maps which are allowed to keep and maintain the tracks

In the year 2011 In facilities like this one, especially in Public Works Operations Center, Rock Hill, South Carolina, the infrastructure of the city such as a network for the supply of water and plants for the treatment of water in the real time can be monitored. On the right screening the map is displayed, hand in hand the wall goes with many figures and diagram along with the presentable charts which show how the system of documents is generally running at the present. (Antoine Picon, 2015)

Melbourne as a case study of smart public spaces in cities.

The Melbourne City in the year 2013 in Australia sent to email addresses along with national identity card numbers to address to the trees so that the possible threats to the trees can be reported by the citizens and they can in this way contribute to supporting greenery as well as health. The vandalism is guarded as a result and trees remain safe. To the human networking data, one can like them as well. The example consists of a digitalized bridge between humans and non-humans in nature so that in the superior beings a link is established between trees and local people and electronic media can be used to encourage much awareness by campaigning.

The strategy was to conserve forests around the city of Melbourne and the aim of this project was to encourage awareness with the noble cause which is to protect the greenery and nature. According to the website by the officials of Melbourne government, an enormous population of Melbourne trees is over 70,000 trees which are owned by the council and the net worth of these trees as per estimation is \$650 million. In the parks, gardens and open spaces or tree-lined streets of Melbourne trees constitute the defining parts, and they develop the environment of the city pleasant since trees also help in temperature regulation. Trees in the past few decades in the city of Melbourne are under immense shock or stress due to the severity of the drought, restrictions of water and extremely heated periods and there are many in the state now which show the decline in the number of trees present inside the city. The consequences are expected as to lose 27% of the

population of trees at present in the coming up the decade and in the next two decades, it could be 44%. When this loss is aggregated, the city forests of Melbourne are on the verge to face severe challenges in the future, one of the biggest challenges is the climatic variations and growth of the city. In the city of Melbourne, the strategy to conserve the tree is aimed to manage such changes which are taking place and to protect trees against the vulnerability in future by offering a framework of a robust strategy for the longevity and evolution of the forests in the city of Melbourne. (Melbourne City council Report, 2013).

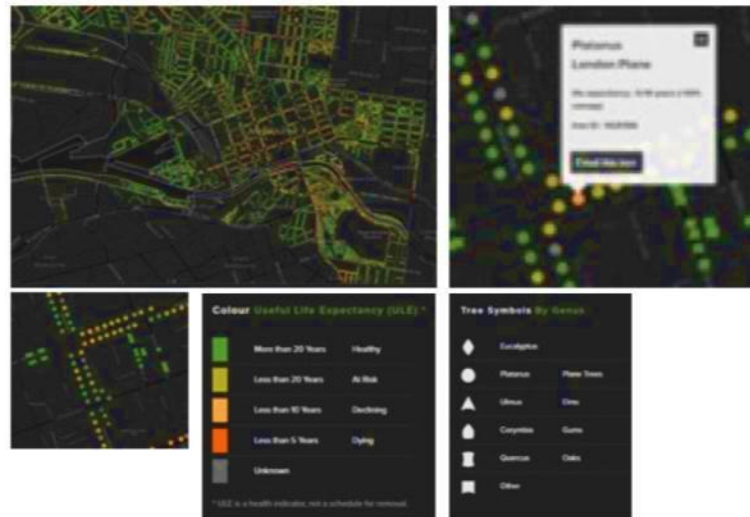


Figure 7 A digital map of the city, through which trees are browsed by location, genus, age expectancy and a unique email address for each tree to report on it the condition of the tree or any vandalism.

Discussion “ the Egyptian situation “:

There is no doubt that the urban context reflects the character of the society, the environment, and the local culture and identity and the smart technology have the power to redefine the urban space, based on that, the public admiration of latest technology will have a significant impact in the massive use of smart solutions through designers. To some developing countries, Egypt as well, using and applying systems is regarded as a forceful statement about the country’s economic, social, cultural Aspects. Therefore, This use if not codifies and used in accordance with the well-organized methodology that knows, what must be done and what should be avoided. The result will be a negative impact on both the culture (may lead to local identity loss and frustration) and the economy (raising energy consumption, light, and sound pollution).

For sure there are some positive impacts like Generating new city landmarks and Re-framing existing monumental buildings, it can enhance both individual and mass communication, so it can act as a new style of promoting urban tourism. When the use of smart technology has negative and positive aspects, it leads to the need for the approach to evaluating the use of this technology.

The researchers were adopted in preparing the evaluation methodology to his personal view of the previous display various forms as well as a reviewing of some academic publications (Denisse. I,2011) (Martin. B and others) (Source: Peter.D. and Kim. H, 2010) (Patrick. T, Eva. H, 2012)) Hendrik W, 2010(. Which concluded that there are some criteria can act as main axes of evaluation:

- 1- The urban space morphology: perceptibility, close distance effects, and long-distance effects.
- 2- The smart intervention: Which include the size and value, location and its form. The type, level and color of light, the level of abstraction, and the information included and the way of interaction.
- 3- Technology: the level of technology “high, medium, low.”
- 4- Information: the content and the message included (data, text, film) and how it is suitable for the stakeholders.

5- Interaction: the type (direct \ indirect), self-expression possibilities, and controllability.

These criteria should be studied in conjunction with cultural, economic, physical and social environments and conditions, the order of priorities for the criteria should be defined in accordance with the impact of these environments. In case of urban space of monumental and historical content, the priority should be for the urban space morphology, and in case of commercial or entertainment content, the priority should be for information and interaction criterions.

Conclusion:

It is completely apparent that space which is in the cities for public and is smart extremely has an average growth for any space in the public for cities. Smartness is a term which is to be applied at the broad scale and it is not possible to summarize it since it is dependent on both forms of technologies, financing, and adaptability of users along with the creation of laws and current guidelines to train the data protection for the end users and performing the most efficient possible services to the users at the same time. The instantaneous data is supposed to be completed and this ability can help to prevent loss of life as well as properties of people and it involves automatic emergency based services which start from the automated evacuation and there is no need to call a person in this period of crises.

The smart systems have faster adaptability and yet they are allowed to be developed totally and some networking features which are nontraditional like Bridj bus wise traffic is forecasted to help in the reduction of the emission of carbon footprint and at the same time to the end users they will be more efficient and money saving.

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