

Turning the tide: Aiming for a smarter Mumbai city

With its large population and an infrastructure system that's bursting at the seams, Mumbai might seem like a lost cause. However, there is still hope for turning things around, feels architect **Dilip Deshmukh**. Through this analytical article, he shares insight on the roadblocks, challenges and prospects that face Mumbai in developing it into a smart city



Let us evaluate the meaning of word "Smart"

Can a smarter, scientific approach be adopted to further develop a metro city like Mumbai? First, let us evaluate the meaning of smart in the context of development in metro cities, which are in existence for more than 350 years.

The meaning of smart as per dictionary is 'clean, tidy and stylish'. However, in my opinion,

smart also includes dynamic and clever meaning of a smart city. A smart city can be classified as a self-sustaining city in areas of infrastructure, energy, communication, including IT and road networks.

Further, it stands for integral but dynamic growth to establish best human life practices for the people, by the people

irrespective of cast, creed and economic status, including but not limited to link with highest human values that are believed in the world.

Here's the lowdown on seven essential pillars that in my opinion define a smart city in a more holistic approach.

The seven pillars of a Smart City

Pillar 1 Social and extraordinary life

Urbanization has led to a paradigm shift in lives of population residing in cities. In cities, all walks of people are seen earning for their family. Therefore, there has been a social aspect to each category of people living in urban areas. For example, labour, skilled labour, service-oriented and professionals and business people have different kind of lifestyle and modes of entertainment. It is further divided into caste-wise population. However, everybody wants to live an extraordinary lifestyle pertaining to their earnings and wants to enhance on both the fronts.

Perhaps, it is time to adopt best life practices according to culture of the country at large. The government should come up with a white paper on the best practices of life so as to guide people of all walks of life to lead it in decent ways. It's

essential that various NGOs and spiritual organizations to come out with a nationwide debate on this particular subject and come to the conclusion as to how to live a life in the best possible

manner in order to make it a big success. It is not caste, creed or discrimination that will bring happiness to self but the lifestyle inspired by best practices that are sustainable to fight odds in life.



Pillar 2

Education for all

Education is the second most important pillar, which is essential in sustainable social and leading an extraordinary life. Education is not just gathering information to earn bread and butter but to evaluate the past and the present and move to a brighter future. The more you are educated, the more you will have peace of mind. The more you have peace of mind, more you will have homogeneous

social life. Education is to gain knowledge from the past to get you inspiration, make or create from the future and live an extraordinary life in the present.

We can derive such education where we can invent best technologies in order to make our life in peace of mind. I invite educationists to hold global conferences and invent an education technology, which is cutting-edge in this field.

A curriculum should be devised to accommodate all classes of life who can start earning at the early age. Following age-groups and their standards given are only for the representational purposes. In each age-group a student must learn value for country, life and fellowship.

A Primary Education

Age-group: 1-12 years, Class I-VII

B Secondary Skilled Education

Age Group: 13-17 years, Class VIII to X and XII

C Higher Education:

Degree in respective fields



Pillar 3 Employment opportunities for all

Without employment, it is needless to think of a smart city. Each and every city, not just a smart city alone, shall have an in-built mechanism to offer employment opportunities for its citizens. There can be some percentage to each category as narrated

below. It is not difficult to have a job if we are determined. Let our experts in this field work out some formula to evaluate a job-for-all opportunity in a smart city.



- a) Labours – Unskilled
- b) Labours – Skilled
- c) Undergraduates – Service industry
- d) Graduates – Intellectual/ but specialized service
- e) Professionals – Highly specialized
- f) Any other



Pillar 4 A complete modern city is an intelligent city

A smart city is one which uses information communication Technology (ICT) to engage citizens, to deliver city services, and an improved urban experience. Intelligent city refers to the knowledge network to advance economic development; the smart city emphasizes the integration of technological networks and in-built environment. Smart cities are often described as both urban systems and the human/ social component. It also has dynamics and flexibility to change from time to time as per the needs based on the factors suitable to betterment of society. The smart cities are economic drivers of the country and excellent contributors to the growth of the country in terms of culture and developments in all areas of life.

Development of all types of infrastructures, civic facilities and means of all types of communication

Components of a smart city

Supporting infrastructure: A smart city relies on Information Technology broadband networks to operate. Today, high-speed broadband networks are critical for road, water-conservation, sewerage and electricity. People stay connected through social-



network applications. Video-streaming and gaming over the Internet are replacing broadcast on television as the main form of entertainment.

Business must have 24/7 access to such instruments. To build proper foundation, one must have high-speed broadband and city wide communication. Video-on-demand, Internet TV peer to peer file sharing, tele.-conferencing, among others is expected to represent 80-90% of internet traffic in 2017. Cloud computing requires centralized data processing and storing. Hence, data centers are an essential component of a smart city. There will be multiple devices used by members in a particular family, such as PCs, laptops, television, mobiles and tablets. Members in a family will be simultaneously streaming high-definition video streams on separate devices and will require ultra-fast bandwidth speeds. Over a time, more devices will be used, such as washing machines, thermostats, refrigerators, power meters, light bulbs, applications

like sensors used for smart-grid, smart homes, smart transportation, smart water. Machine to machine (M2M) applications are used for monitoring. It is projected that M2M traffic over the internet will grow by 84% by 2018. More people are working part or full-time from homes. Even full-time office employees need to access work networks during off-hours. In order to accommodate this growing demand, we need to plan a high-speed broadband network with 100 mbps download speed. India is emerging a global power in creating business. Therefore, it is the need of the hour to upgrade our IT infrastructure. Another area is wireless network which is essential in cutting cost on cable networking. All the devices will be Wi-Fi-enabled hence it is absolutely necessary to switch over to such Wi-Fi technology. A smart city will need both robust wireless networks to provide the mobility and convenience.

Technology application and Data: There will be need to develop technology on-going,

including but not limited to development of various applications its improvisation and up-gradation and data communication. Data communication will require to quick response, storage and smart accessibility.

Sustainability resilience and energy:

Core objective of a smart city is to utilize smart technologies to improve the quality of life without compromising on the ability of coming generations. A smart city is expected to show proactive change whenever required, whether it is ageing infrastructure or natural calamities climate change or population growth, it is expected to react positively to a makeover whenever required. Smart city technologies are also playing a strategic role in reducing emissions, encouraging clean energies. It is essential to use alternative energy systems to produce efficient, reasonable, cost-effective source of energy, which will ultimately reduce pollution and carbon footprint. And thus save the earth.

Pillar 5

Self-sustaining infrastructures in sectors of power and solar power

A smart city must have power produced from natural, conventional and non-conventional resources. Our country is having abundance of solar energy and hence must adopt or invent possibilities to produce energies for all the future activities.

Smart transport is another way to fulfill the gap in a smart city. It shall provide low fares and efficient services throughout the city as a proud partner in business.

Green buildings concept is a special ingredient in making the idea of a smart city a 100 per cent success. It not only reduces use of material, but it also uses recycling of building material thus helping in saving natural resources and preserving it for future generations.

Zero-garbage is essential aspect of any smart city. Recycling of all types of wastages and putting them to re-use is quite important. The serious issue of disposing chemical and bio-medical wastes is suitably required to be tackled. A scientific approach adopted in disposing it of will give positive returns in the future.



Pillar 6

Self-sustaining agro infrastructures

Right from milk to vegetable produce, in my opinion vegetables must be produced in the same district of neighborhood. It will not only save the transportation cost but will also enhance ozone in the nearby vicinity directly. Fresh vegetables can be available easily that too at a reasonable cost. There will be increase in the quality of soil as well.



Pillar 5 Political leadership

A socially-empowered community demands more transparency and accountability from the government, corporations and political leaders. Nowadays, a political stability is sustainable on these parameters, more transparency, freedom and self-expression. He/ she who will exercise will be ruling the hearts of people. Dynamic, action-oriented and decision-making leadership

will have scope to expand in the 21st century.

A popular government and dynamic leadership is directly proportionate to power.

A smart city has direct potential to increase the quality of governance by utilizing applications and data to provide the most cost-effective services. It also helps the government to share information.


Can Mumbai emerge as one of the smart cities?

Mumbai started developing somewhere from 1700 AD. In particular, Mumbai city is reclaimed and connected by seven islands, possibilities are that, these islands could be reclaimed because of shallow waters or depth of reclamation may not be more than 5 to 7 feet and in some exceptional cases it may be 25 to 50 feet.

There must be distinct geographical partition by

passage of backwaters in city and suburbs. Now, a city is almost reclaimed and it is absolutely difficult to identify these islands except when craters form in the middle of roads or some portion of land collapses and creates big hole within ground, maybe it is because of filling of land to the depth of 25 feet to more.

Keeping in view the above characteristic of a land, we need to review the developments in city areas. However, a proper study is required to ascertain the man-made filling of earth in the island at large.



It is the need of the hour to propose vertical real estate development rather than spreading across the land and make available a sizable natural ground coverage to achieve open space criterion per capita as per town planning standards.

Here, what we are talking about is also creating required infrastructure if we make available the natural ground open space, then we have a scope for making the city smart in a true sense.

As regards making Mumbai a smart city, there are lot of constraints and equal opportunities together which go hand in hand.

In order to make Mumbai a smart city, we need to decide first what will be the cap on the population of the city in terms of future growth looking at least 35 years ahead. Recent study reveals that the city had a

decline in population growth rate and observed migration of families from city to suburbs, mainly due to increase in family size and need of bigger or multiple houses. Hence, those families who could not afford to buy another house in their locality were forced to sell the present residence and migrate to the suburbs. They were able to buy two houses as well as able to save money for the future retired life. Today, the population of Mumbai, including the suburbs is 130 Crores, which means 26 lakh families are staying in Mumbai. Of these, about 60 lakh people are living in slum areas. There are about 19,000 old buildings other than slums, which are in urgent need of re-development. There are residential colonies which are under private trusts and central government having more than 25 sq. meters per person of open space. However, such areas are not open for the general public.

There are areas like Sanjay Gandhi National Park (SGNP),

mangroves and airport land, which restricts the possible development in terms of legitimate growth of Mumbai.

Developing Mumbai into a smart city is definitely a dream since it has lots of challenges for any future development. There are inadequate road networks which need to be improved. Inadequate infrastructure services, including electricity, sewage disposal and treatment, water reservoirs, network of water distribution, fuel for cooking, lack of means of energy efficiencies, lack of use of solar energy, recycling of building materials, effective communication, civic services, hospitals, educational facilities, recreations spaces, standard living conditions. Last but not the least, it has lack of one vision, one mission in the society which requires systematic training. In all odds then, how is it possible to make Mumbai a smart city and what are the challenges to make it happen.

Though Mumbai is ready for a makeover through re-development, some of the challenges it faces in terms of a smart city include

- It is already developed and thickly populated
- It has inadequate infrastructure to serve future development
- It has inadequate source of electricity and green source of electricity
- It has inadequate source of water reservoirs to cater to future development
- Ineffective road network
- Ineffective public transport
- Inadequate educational facilities to different age of people
- Ineffective business model to create money to implement smart city concept
- No plan to combat global warming effect
- Common man has less money power to buy houses, hence not affordable
- There is less opportunities in business or service industries
- There is tendency to form community-based colonies
- There are no SOPs to best practices in life published by the government authority
- There is no effective law in development of old buildings and creating affordable housing
- There is ineffective governance and delays which causes high price rise in the commodity.
- There is no sectorial or neighbourhood planning concept in regulations which will ultimately accelerate the process of redevelopment
- There is no priority development clause
- Families are living in tenanted properties and hence do not have choice of development

However, not everything is lost. Some of the factors that favor Mumbai as a smart city include:

- It is the financial capital of India
- It has a long coastal frontage
- It is having an international importance as finance capital of India
- It has potential to grow as international tourist destination
- It has a potential to explore SGNP as an international tourist destination
- It can be developed as an international market hub as free port
- It has a potential as an educational destination
- It is also near to JNPT and most preferred destination for international business
- Water-sport activities of the best in class can be proposed
- It has potential in developing service destination to world\
- It has potential to develop IT-enabled services in reasonable cost
- It has potential to super servers planted in Mumbai
- It has strong cine industry in the form of Bollywood
- It has potential to develop as the world's finest place to live in at affordable prices for business professionals
- It has potential to have vertical growth
- It has potential to expand from north to east directions
- It has all types of skilled and semi-skilled personnel
- It has natural resources
- It has potential to improve infrastructure
- It has support from all business communities from across the country

Understanding the future of smart city for Mumbai in the face of above challenges

Mumbai is having the potential of re-development only. Hence, a sectorial plan of area bounded by four roads not less than 10,000 square meters must be prepared and sub divided into neighborhood which will give scope to make the sectors into smart sectors. It can be developed under Development Control Regulation (DCR) 33/9 urban renewal schemes. Essentially, regulation would make it compulsory to convert it into a smart sector and if required, proposed new roads all parameters are stated in the seven pillars of a smart city.



- An infrastructure that is self-sustaining shall be proposed in such Urban Renewal Scheme (URS), a close monitoring and incentive can be awarded in terms of ICT and other infrastructures
- A green building concept for all high-rise structures should be made mandatory
- It is the basic responsibility to provide water facilities for drinking to buildings
- A road network can be improved under special powers in URS
- All the civic amenities can be proposed in sectorial plan
- Affordable housing is essential part of URS which will provide subsidized affordable houses
- Slum pockets can be developed under URS and housing stock can be created
- Wherever there is low-lying area that portion needs to be filled up as keeping flood areas does not shift due to land fill. However, this aspect needs careful study. Incentives can be granted to such areas so that community shall come for re-development within stipulated time.
- A priority clause shall be incorporated in regulation so as to make the infrastructure development effective and can be completed within stipulated time frame. A tribunal for disputes shall be established and all the cases shall be treated in fast track. No appeal shall be allowed thereafter
- The airport limits restriction on height of buildings. In my opinion, airport runway and taxiways can be lifted up to 60 meters and a comprehensive plan can be worked out for which a proper study is required. It is estimated that on commercial exploitation of airport vicinity under airport authority can earn Rs. 30 lakh Crore as revenue. Similarly, if Sanjay Gandhi National Park is developed as an international tourist destination, it will fetch an earning to the tune of Rs. 5,000 Crore annually.
- Mithi River can have means of transport for citizens. Coastal roads can be developed in such a way that we can fight global warming and water sports in the coast of Mumbai can provide additional revenue
- Global warming effect is a challenge it can be neutralized by allowing future development with still proposed 25 feet high with an arrangement to fill the land in case of water levels comes up.

The government has a great challenge in making Mumbai into a smart city. Therefore, we propose Mumbai Development Corporation under one roof of the Municipal Corporation, Rent Corporation, Eligibility Corporation and Construction Corporation.

Further, I am of the opinion that no task is difficult if we make up our mind to improve. The core aim of this write-up is to drive people and those in power to take a positive note in developing Mumbai into a true smart city in all perspective.

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