

Smart City “A Dream to be true”

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Abstract— India has witnessed massive growth in its urban population and it is envisaged that the urban population will double to 750 million by 2050. For decades our policy planners and city administrators have been facing challenges such as large influx from rural areas, land and water pollution, inefficient use of resources, unplanned growth, sub-standard delivery of urban services, huge infrastructure gap.

To accommodate this enormous and unprecedented surge in urban population it is imperative that India needs to develop new cities as our existing cities are over saturated and poorly managed. The new Government which has announced its intent to develop '100 Smart Cities' is a refreshing approach. It is anticipated to comprise a mix of up-grading the existing cities and building new cities or Greenfield cities.

Keywords— *Smart City, FDI, Energy efficiency, Demand Management, Environmental Sustainability*

1. Introduction

Urbanization accompanies economic development. As countries move from being primarily agrarian economies to industrial and service sectors, they also urbanize. This is because urban areas provide the agglomerations that the industrial and service sectors need. In fact, 90% of the world's urban population growth will take place in developing countries, with India taking a significant share of that. Urban areas also contribute a higher share of the GDP. While the urban population is currently around 31% of the total population, it contributes over 60% of India's GDP. It is projected that urban India will contribute nearly 75% of the national GDP in the next 15 years. It is for this reason that cities are referred to as the "engines of economic growth" and ensuring that they function as efficient engines is critical to our economic development. This trend of urbanization that is seen in India over the last few decades will continue for some more time. The global experience is that a country's urbanization up-to a 30% level is relatively slow but the pace of urbanization speeds up thereafter, till it reaches about 60-65%. With an urban population of 31%, India is at a point of transition where the pace of urbanization will speed up. It is for this reason that we need to plan our urban areas well and cannot wait any longer to do so. The relatively low base allows us to plan our urbanization strategy in the right direction by taking advantage of the latest developments in technology

especially in ICT (Information and Communication Technology). Moreover, it also offers us an opportunity to create conducive environment for creation of many times more employment opportunities and economic activities while improving the quality of life substantially. It also allows an opportunity to learn from good practices and mistakes made elsewhere within the country as well as outside the country. It is in this context that the Government has decided on developing 100 "Smart Cities" in the country. Accordingly, in his budget speech of July 2014, the Finance Minister has stated as follows:

"As the fruits of development reach an increasingly large number of people, the pace of migration from the rural areas to the cities is increasing. A new middle class is emerging which has the aspiration of better living standards. Unless, new cities are developed to accommodate the burgeoning number of people, the existing cities would soon become unlivable. The Prime Minister has a vision of developing 'one hundred Smart Cities', as satellite towns of larger cities and by modernizing the existing mid-sized cities."

2. Smart City

Smartness in a city means different things to different people. It could be smart design, smart utilities, smart housing, smart mobility, smart technology etc. Thus it is rather difficult to give a definition of a smart city. However, people migrate to cities primarily in search of employment and economic activities beside better quality of life. Therefore, a Smart City for its sustainability needs to offer economic activities and employment opportunities to a wide section of its residents, regardless of their level of education, skills or income levels. In doing so, a Smart City needs to identify its comparative or unique advantage and core competence in specific areas of economic activities and promote such activities aggressively, by developing the required institutional, physical, social and economic infrastructures for it and attracting investors and professionals to take up such activities. It also needs to support the required skill development for such activities in a big way. This would help a Smart City in developing the required environment for creation of economic activities and employment opportunities.

As consumers of private goods and services we have been empowered by the Web and, as citizens, we expect the same quality from our public services. In turn, public authorities are seeking to reduce costs and raise performance by adopting similar approaches in the delivery

of public services.

However, the concept of a Smart City goes way beyond the transactional relationships between citizen and service provider. It is essentially enabling and encouraging the citizen to become a more active and participative member of the community, for example, providing feedback on the quality of services or the state of roads and the built environment, adopting a more sustainable and healthy lifestyle, volunteering for social activities or supporting minority groups. Furthermore, citizens need employment and “Smart Cities” are often attractive locations to live, work and visit.

But the concept is not static: there is no absolute definition of a smart city, no end point, but rather a process, or series of steps, by which cities become more “livable” and resilient and, hence, able to respond quicker to new challenges. Thus, a Smart City should enable every citizen to engage with all the services on offer, public as well as private, in a way best suited to his or her needs. It brings together hard infrastructure, social capital including local skills and community institutions, and (digital) technologies to fuel sustainable economic development and provide an attractive environment for all.

There are five key aspects to smarter approaches, which are strongly information driven:

- A modern digital infrastructure, combined with a secure but open access approach to public re-useable data, which enables citizens to access the information they need, when they need it.
- A recognition that service delivery is improved by being citizen centric: this involves placing the citizen's needs at the forefront, sharing management information to provide a coherent service, rather than operating in a multiplicity of service silos (for example, sharing changes of address more effectively), and offering internet service delivery where possible (at a fraction of the face to face cost).
- An intelligent physical infrastructure (“smart” systems or the Internet of Things), to enable service providers to use the full range of data both to manage service delivery on a daily basis and to inform strategic investment in the city/community (for example, gathering and analyzing data on whether public transport is adequate to cope with rush hour peaks).
- An openness to learn from others and experiment with new approaches and new business models.
- Transparency of outcomes/performance, for example, city service dashboards to enable citizens to compare and challenge performance, establishment by establishment, and borough by borough.

3. Challenges in developing smart cities in India

With a large number of people migrating from rural areas to cities in search of better opportunities, the goal of providing a roof over everyone's head is bound to get even more challenging for the government.

The present NDA government at the Centre has promised housing for all by 2022, when India completes 75 years of independence.

In 2013, there was a housing shortage of 108 million units for a population of 258 million households in the country. Out of the overall housing shortage, urban housing shortage accounted for 25.7 million units. The overall housing shortage grew at a CAGR of 0.7 per cent during the period 2003-2013. The gap widened more profoundly by 1.8 per cent in urban areas during the same period. It is expected that the overall housing shortage will reach 114 million units by 2018.

With rapid growth in population accompanied by urbanization, the housing shortage in the country will only get more acute. India's population is expected to reach 1.3 billion by 2021. By 2022, more than one-third of the population will be city dwellers. As of 2011, 31 per cent of India's population lived in urban areas.

According to CRISIL Research, the urban housing shortage will grow faster than the rural housing shortage over the next five years due to increase in migration to cities, rise in incomes and proliferation of nuclear families.

To deal with the rapid urbanization and also avoid severe strain on the existing infrastructure in cities, the government intends to create 100 smart cities as satellite towns of large cities. A sum of Rs. 7,060 crore has been allocated in the Union Budget 2014-15 for the ambitious project.

A smart city is one which enjoys sustainable economic growth and high standards of living. Investments in human and social capital, physical infrastructure such as transport, and social infrastructure like healthcare, education and recreation, are the usual hallmarks of such a city. It intelligently manages resources and uses Information and Communication Technology and technology platforms including automated sensor networks and data centers to make living efficient. In other words, a smart city has a mix of commercial (services and manufacturing), residential, social infrastructure, physical infrastructure and public utilities.

The PHD Chamber of Commerce and Industry and CRISIL recently released a white paper on smart cities. It said that while the concept of smart cities was a promising one, several challenges would be encountered in development of such cities.

Pointing out that a smart city could take between 8 to 10 years to build from scratch and even more time to attract

businesses and people, the white paper said such an initiative required commitment and persistence on part of the government over a long period of time. It stressed that the authorities needed to be aware of the latest relevant technologies and the technologies had to be tailor-made and used effectively taking into account the topography, location and natural resources of the area. It added that the success of a smart city depended on residents, entrepreneurs and visitors actively participating in energy saving, implementation of new technologies and decisions to improve quality of life.

The white paper outlined the key measures that need to be initiated for success of smart cities in India. Highlighting that the government had a major role to play in development of smart cities, it called for setting up of a central planning authority that would manage and provide single window clearances, monitor progress of such projects and ensure compliances. To attract businesses to newly developed smart cities, the white paper suggested incentives in the form of long-term tax holidays and other tax sops. It further said that in order to develop smart cities at par with global standards, the government needed to involve the private sector as well as global urban planning groups who had implemented the concept of smart city elsewhere in Asia.

4. Dream of Smart City and “Made in India”

In his Independence Day address to the nation Prime Minister Narendra Modi had called upon foreign investors to “Make in India.” He has also sought foreign investment from China, Japan and NRIs in the United States. He hopes that Multinational Corporations (MNCs) from these countries and others will invest and help India become the workshop of the world. On the other hand, National General Secretary of BJP, Muralidhar Rao has recently stated that the expansion of manufacturing in India cannot be driven by foreign investments. “The Make in India campaign is not driven by foreign capital. The track that we are laying for Indian manufacturing is not led by foreign capital,” he said. The two statements create a sense of confusion regarding the precise role of FDI in the India Story.

The underlying assumption of inviting FDI is that India needs foreign capital and technology to be able to manufacture to world standards; and the impact of such foreign direct investment (FDI) will be hugely positive on our economy. I had undertaken a study of impact of FDI on Indian economy about 15 years ago. I had found that the impact is positive in the short run but becomes negative after about 15 years. FDI creates demand for cement, steel and machinery when a new project is established. This leads to higher growth rate in the short run. In the long run, however, profit repatriations start. This leads to the bleeding of our economy. Secondly, MNCs have deep pockets. They resort to predatory pricing and force

domestic businesses to shut down. Having established their dominant position in the market, they start charging exorbitant prices. Thirdly, they kill domestic entrepreneurship which is the long run engine of growth.

I searched on Google Guru for recent studies on the topic and found that my assessment is confirmed. A study by University of Minnesota found that specific instances of FDI have generally had a negative impact. Study of impact at economy level found that there is no independent impact of FDI on economic growth. “Independent” here means that once the impact of education, domestic savings, free trade, etc. is removed then no impact of FDI is seen. Implication is that the alleged positive impact of FDI is actually due to these other factors and not due to FDI itself. A study done at University of Calcutta found that FDI and economic growth go together. But the causality runs from economic growth to FDI. In other words, FDI does not push growth. FDI comes to make profits one growth has taken place.

A study by University of Amsterdam found that the impact of FDI depends on the source country. FDI from UK was found to have positive impact on the host economy, that from Germany and USA was found to have a negative impact and that from Japan was found to have a severely negative impact. A study by Harvard University said that FDI exerts an ambiguous effect on growth. FDI in the primary sector has a negative impact on growth, while FDI in manufacturing has positive impact. I must confess that few studies commissioned by the World Bank and the International Monetary Fund found positive impacts of FDI. However, I have deliberately chosen to ignore them for being motivated. Conclusion is that FDI is not so good. At best it has no impact.

The Policy of attracting FDI has to be reviewed in this backdrop. It seems that FDI is beneficial where it comes along with frontier technologies. Such FDI is welcome. Problem lies with FDI that mainly brings capital. For example, Hindustan Lever had bought Indian company TOMCO. Such FDI brought only capital and no technology. Such capital-led FDI needs to be rethought. Actually the developing countries have become exporters of capital. All the developing countries taken together received 506 billion US dollars of FDI in 2006 according to statistics provided by the World Bank. Against this, an amount of 858 billion US dollars has been remitted illegally from developing countries according to the international watchdog Global Financial Integrity. The developing countries are getting less money from FDI than they are losing through illegal remittances. If Mr Modi wants to jumpstart investment then he should focus on preventing illegal remittances. The resolve of the NDA Government to bring back black money stashed abroad is an admission of this illegal outflow.

More importantly, studies indicate that MNCs have a huge role in making these illegal remittances. A study supported by the Finnish Government estimated that only a

small part of illicit capital flight is due to corruption. “A lion’s share of developing countries’ tax losses result from tax evasion and avoidance by MNCs,” it found. Another study by a Belgium-based organization has estimated that the developing countries lose more than \$ 1000 870 billion each year through illicit financial flows, mainly in the form of tax evasion by MNCs. Literature available on the net is full of details of how MNCs misuse transfer pricing to make these illegal remittances. They over-invoice imports and under-invoice exports made to their principals. In this manner the developing countries are losing huge amounts. The policy of inviting MNCs to make in India is, therefore, like inviting the thief to set up the police station in the town. They may appear to bring dollars upfront but they take out much more on the sly.

The FDI policy needs to be revisited. Every FDI proposal must be closely subjected to a technology audit. Proposals involving transfer of advanced technologies alone should be welcomed. All proposals should also be subject to a social audit. Often the direct impact of an FDI may be positive in creation of jobs. But it may lead to more unemployment by displacing small producers. A proposal to make textiles may, for example, lead to unemployment of large numbers of weavers. Lastly, the character of the source country must be kept in mind. Mr. Modi must direct the Finance Ministry to commission a study on the impact of FDI that has come from various countries. If FDI from Japan has been found to have a severely negative impact in developing countries in general then we should be wary of proposals coming from that country.

The Government must clear the confusion about the role of FDI in the economy that has been created by different statements emanating from the Prime Minister and the General Secretary. The Government should tell the people its assessment of the role of FDI in bringing new technology and in both generating and killing employment. Also it needs to be made clear what steps the Government proposes to take for preventing illegal remittances via transfer pricing by MNCs; and whether there will remain a need to attract FDI for augmenting our requirements of capital after these steps are taken.

5. Suggestions make smart cities possible

5.1 Energy efficiency

Energy concerns are also a key feature of “Smart Cities”. Energy efficient practices are adopted in transportation systems, lighting and all other services that require energy. Tariff structures are such that conservation has incentives. Awareness programs lead to a culture of conservation. Good areas to focus energy efficiency measures would be the building material used, the transport system, sewerage and water supply systems, street lighting, air-conditioning systems and energy consumption in buildings.

5.2 Demand Management

While enhancing supply to meet the demand is important, Smart Cities would also lay special emphasis on demand management, by creating incentives for savings and disincentives for excessive consumption. This could be by way of rate structures that are affordable and low levels of consumption, but increase steeply as more is consumed. For transport systems the demand management efforts will be such that they promote the use of non-motorized modes of travel or public transport and discourage personal motor vehicles. They also promote shorter trip lengths by improved integration of land use and transport plans and mixed use planning, where residential and commercial areas are well interspersed.

5.3 Improved access to information

A very important feature of all smart cities is good citizen access to information. Whether it is regarding city specific data or the measures being taken by municipal bodies or information relating to various service providers such as transport and similar information relevant for potential investors has to be conveniently available. This could be through multiple channels – internet, mobile apps, radio, TV, print media, etc.

5.4 Environmental Sustainability

Pollution in our cities is growing at an unprecedented pace. As per the WHO report published in 2014, our cities are amongst the most polluted ones in the world. This has resulted in a high rate of air borne diseases in all age groups. To create a more liveable and healthy environment, it is therefore important that smart cities that are planned, are environmentally sustainable. This would mean not only improving the air quality but also reducing wastage of water, electricity, fuel etc. Steps have already been taken in this regards, however much more needs to be done. Star rating is being done for electrical appliances and in the building industry. All vehicles should also be star rated to indicate their energy efficiency. Also industries should be given incentives to reduce their carbon emissions.

5.5 Participation of the Private Sector

PPP allows Government to tap on to the private sector’s capacity to innovate, invent and bring in efficiency. Greater involvement of the private sector in the delivery of services is another instrument as it enables higher levels of efficiency. However, there are a few concerns that need to be addressed. These are defining the scope properly, dispute resolution mechanism at local level, designing of PPP Projects so that enough flexibility is available while ensuring 100% transparency and accountability, shortening the procurement cycle and due recognition to quality rather than going in for L-1 only.

Over the last few months, several professional agencies made presentations in the Ministry highlighting different

aspects of what constitutes a smart city. Globally renowned consulting companies like McKinsey, KPMG, PWC, ILFS, Accenture etc., have presented a wide range of features that are the hallmark of a smart city. Leading experts like Dr Keshav Verma have also presented some of the important features of a smart city. Leading IT companies like Microsoft, IBM, CISCO, WIPRO, TCS, INFOSYS, Mahindra Tech have made presentations on the role that IT can play in developing smart cities.

5.6 Citizen participation

Citizen consultation and a transparent system by which citizens can rate different services is yet another instrument for improving performance. Making these ratings openly available for public scrutiny creates a powerful incentive for improved performance and a disincentive for poor performance. A Smart city also communicates well with its people and enlists their support in everything it is doing. The culture of working in a closed environment needs to end as people are often the biggest support base for any initiative a city takes up, if they have been informed of the efforts and the reasons for the same. Social pressure on other citizens can often remove resistance and facilitate a greater degree of civic discipline.

6. Practical implementations

To implement 'Smart City' concept to existing the cities will have to migrate from physical methods of data capturing to digital methods by installing sensors/surveillance. Further various systems within the cities will have to be seamlessly interconnected with each other and thereby offer real time information for action of users ie administrators and the citizens. For example one of the initiatives could be to monitor traffic and congestion levels on various roads on real time basis. Then this data can be used to feed into the variable message sign boards to direct or redirect traffic on affected roads and also alert the citizens about it through SMS's on their mobile phones. This can drastically reduce congestion levels and result in reduction of traffic emissions, fuel consumption etc.

However implementation of 'Smart City' program will have to overcome lots of challenges on ground. Firstly this program will have to start from the scratch. Though there are several initiatives such as Smart City project in Surat or traffic surveillance and management system in Bangalore but these initiatives are few and far between. Hence there is very little precedence within the country and the city administrators will have to quickly move up the steep learning curve based on the first hand experiences.

Secondly uninterrupted power supply to these cities has to be ensured which is the basic building block for a 'Smart

City'. Urban Local Bodies in India have been chronically under staffed with lack of capacity and have very little capabilities in Technology to implement such initiatives. Therefore as pre-requisite there has to be a massive capacity building exercise undertaken to sensitize the administrators to bring a shift in their thinking. Acquisition of large tracts of land for building new cities and resettlement of project affected people will definitely be a big challenge.

Some of the key measures that the new government needs to undertake is to formulate a long term vision for the each of the city taking into account the ground realities. Further it should insist upon assembling of teams with right skill set i.e. technology and urban planning & management skills at all levels. Going forward it must be made mandatory for all cities to also have an ICT master plan. There should also be adequate incentives provided for developing the ecosystem such as internet service providers, hardware instruments, and mobile apps etc. which are essential for success of 'Smart Cities'.

The government should undertake a quick assessment of city readiness, growth potential of cities etc. based on which the target cities can be selected focusing more on tier 2 and tier 3 cities. Apart from setting up of Greenfield 'Smart Cities' within the mega industrial corridor projects such as Delhi - Mumbai Industrial Corridor or Chennai - Bengaluru Corridor or Bengaluru-Mumbai Industrial Corridors, the government should also look at the proposed National Manufacturing Investment Zone (NMIZ) where new townships are likely to be built on the backdrop of large manufacturing clusters.

Ultimately creating 'Smart City' is a continuous endeavour and shall have to be relentlessly pursued. The new governments being given a clear mandate by the people of the country to change the way things are, it is evident that they are off to a good start. Like they say a good start is half the journeys covered. Let's hope that they overcome the challenges during the other half of the journey and leave behind a legacy of vibrant and sustainable cities.

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