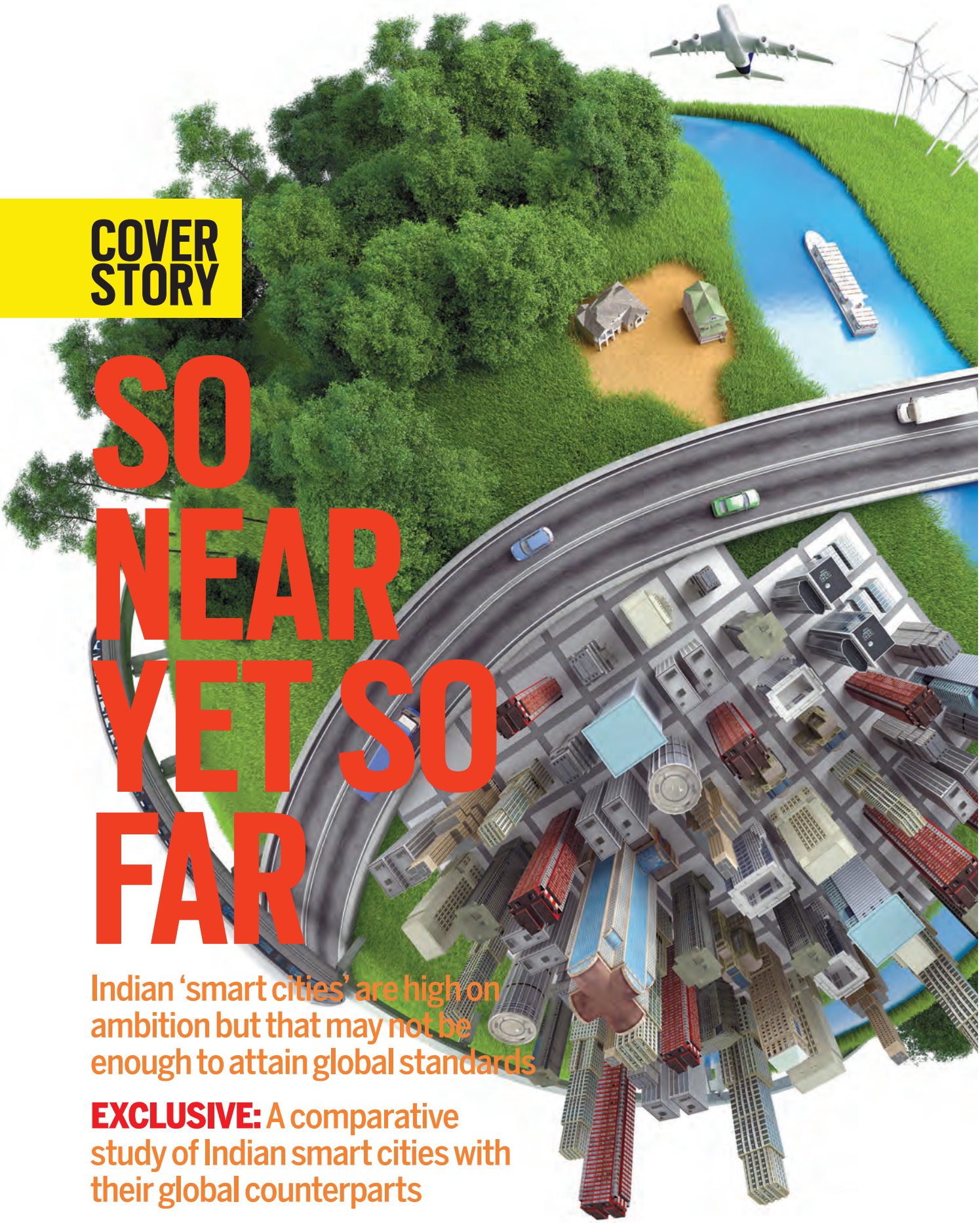
COVER STORY

SO NEAR YET SO FAR



Indian 'smart cities' are high on ambition but that may not be enough to attain global standards

EXCLUSIVE: A comparative study of Indian smart cities with their global counterparts

THE year 2009 marked a watershed in the history of mankind . It was the first time that the number of people residing in urban areas exceeded the number of people residing in rural areas. Our future is increasingly becoming urban. A lot of people (about 43% of the total population) are also now connected to the Internet and have digital access. Over the next few years, both these are going to increase. Both these megatrends have a bearing on what lies ahead for the future of cities and their development. Newer concepts like smart cities that have recently gathered traction lie at the intersection of city elements (infrastructure, mobility platforms), people and technology. It is interesting to see how these building blocks come together for greater benefits to citizens- the people residing in those cities.

Smart cities as a concept was conceived in developed countries and is slowly entering policy debates elsewhere. A notable example is that of India where the coming in of the new government in May 2014 also brought in India's Smart Cities Mission. A lot of planning and discussions have taken place ever since some within the country some with other countries so as to understand how to move ahead on successful implementation of the mission. The concept of smart cities overall resonates well with a country like India since every minute nearly 25-30 people move from rural area to cities in search of better livelihood and other lucrative opportunities. This requires thinking on governance and a concerted effort to find feasible and sustainable solutions to India's institutional, physical, social and economic problems while witnessing, the massive transformation that is underway. It is hoped that such solution oriented thinking can help shape Brownfield and Greenfield cities development and build livable ecosystems of the future.

This present body of work looks at the some of the key conceptual and theoretical underpinnings of smart cities as well takes cues from smart city development efforts in different cities across the world. Apart from the comparative perspective, a detailed case example approach is taken within the Indian context to see how the smart city development can fit in with the overall urban development of India. Case examples, it is hoped, will add to better understanding of the key grassroots level issues. Livability as a construct is often also seen missing in the research on smart cities, and this is where an adequate focus in this study has been given to that dimension as well. Lastly, comments of external experts from outside India namely Kevin Stolarick (known for his work on creative cities) and Susan Zielinski (known for her work on urban mobility) have also been added to give an overall balanced perspective to the debate on Smart City development in India. It is hoped that the following body of work will spark debate on smart cities and also help them become more transparent, participative and vibrant in the process.

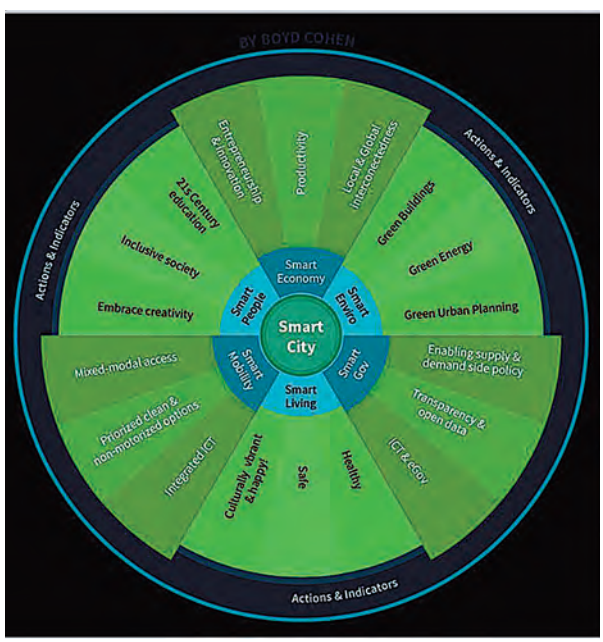
PHOTOGRAPHS: SHUTTERSTOCK

COVER STORY

WHY ARE SMART CITIES SMART?

THE construct of smart cities was drafted in the late 80s to foresee the future of urban development and with time they are becoming a reality across the globe. Its definition varies from one institution/country/city to, but all of them focus on the interlinkages of various elements within a city and their usage of technological innovations. The ultimate aim is to make overall city's processes efficient, build transparency within the ecosystem and improve the overall quality of life for its citizens. As a result various cities with their connotation of 'smart' are pushing their limits for the future transformation and to emerge as the globe smart centers.

Smart cities are cities with certain automated features that make them more productive and sustainable. In other words, they make better use of information and communication technology (ICT) to manage their urban ecosystem. Boyd Cohen, the urban and climate strategist, has explicitly listed the key factors of a smart city by creating 'Smart Cities Wheel '. The wheel was prepared after delving deep into the research work of many people making it a comprehensive tool to understand the components that make a city smart. According to the wheel, a smart city is an integration of six vital components. They are the smart economy, smart environment, smart government, smart living, smart mobility and smart people. These components are further divided into related areas such as, smart environment comprises of green buildings, green energy, green urban planning and smart people relates to educated population, which embrace creativity and help in building an inclusive society. Cities have already started adopting elements of an ideal smart city and are implementing others with time. The reason is that the process of transformation is long, and most of the cities are still working on these areas. Many of them might not be able to accept all the components of a smart city, but they are certainly trying to adopt one feature to the core before implementing the other. It has been observed in the case of Copenhagen- the city has been able to achieve success in the area of Smart Mobility by promoting and prioritizing cycling. It also has been measuring the impact and in 2012, the city's authority collaborated with MIT to create The Copenhagen Wheel. This wheel turns the bike into an electric bike by harvesting the energy used during braking and cycling. The sensors fitted in the wheel also collect information about road conditions, air and noise pollution, which can be easily scanned on the Smartphone of the rider. Thus making it innovative, friendly and a part of daily life. The 'smart' component of smart cities has the potential to make cities competitive and gives a push to building an urban ecosystem. They also offer to bring several amenities on a common platform and then offer the requisite solutions with technological innovation. This structured and sustainable approach makes smart cities different and better than the other cities.



HOW DEVELOPED ARE INDIA'S FIRST 20 SMART CITIES?

AFTER several rounds of assessment, the Ministry of Urban Development declared the first list of smart cities at the beginning of this year. The list comprises of 20 cities in India and is topped by Bhubaneswar followed by Pune, Jaipur, Surat, and Kochi. As the next step, these 20 smart cities will receive funds from the central government to start their development process as projected in their respective proposals. It thus becomes vital to understand the areas that make these selected 20 cities better than the rest of Indian cities. This section will project a broad picture of their existing performance and their next set of action plans, which will be devised over the next five years.

Analysis of the first five cities - Bhubaneswar, Pune, Jaipur, Surat and Kochi provide some interesting insights about their existing development models. All of them have good service delivery of basic amenities like water, electricity and housing. They have also made significant progress on promoting the solid waste management programs such as the efficiency of door-to-door garbage collection in Kochi is 100% and adopting e-Governance to encourage communication between citizen and administration. Their most distinct feature is the use of smart and digital technology for increasing operational and energy efficiency. Some of the smart city features such as CCTV surveillance, use of Mobile applications to increase transparency, energy from renewable sources and affordable housing schemes have already been incorporated into their operations.

The next five cities in the list of top 20 selected smart cities are NDMC (New Delhi), Ahmedabad, Jabalpur, Vizag, and Solapur. Here Jabalpur and Solapur are the not so obvious cities for many, but these two cities have taken progressive steps that have enhanced the quality of life of the region. For example, Jabalpur is one of the few cities in the country, which has established a 'Waste to Energy' plant via PPP Model of 600 tons capacity and which produces 11.5MW energy. Likewise, Solapur has installed a GIS based system to collect and manage property tax as a result of which 90% properties are included in the tax net because of which city's current income has improved by 1.5 times than before . All the cities in this block have taken practical approaches to solve their urban challenges in the area of water supply and housing, among others. They are continuously striving to upgrade their service delivery levels and incorporate technological innovations to deal with their weak areas.

Davangere, Indore, Coimbatore, Kakinada, and Belgaum make it to the third block on the smart cities list. The common characteristic of these cities is their approach to continuously upgrade their basic services with time. Even the proposed plans of these cities indicate that they are looking for a balanced growth, which helps in developing the infrastructure, and also bring economic vibrancy. It has been observed in the case of Indore, wherein the city's authority use ICT in power distribution and smart metering of High

Tension Consumers due to which T&D losses reduced from 24% to 21%. Also, Coimbatore got its Solar City Master Plan approved by Ministry of New and Renewal Energy (MNRE) in 2015 and will be soon implementing the same. It can thus be inferred that these cities are looking forward to creating a clean and sustainable environment by engaging private partners to ensure efficiency in of resource management and energy requirements.

The last cohort of the smart cities comprises of Udaipur, Guwahati, Chennai, Ludhiana and Bhopal. These are important cities of their respective States with a strategic location and even have a low resistance to implement community-driven solutions. To elaborate, Chennai became the first city in India to adopt and implement Non-Motorized Transport policy (since 2014) to promote and encourage pedestrian zone. These cities have been identifying their areas of strengths, which can act as the foundation for future developments. So as to fill the gaps and accordingly set other measurable goals in their city's action plan.

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TOP SMART CITIES OF THE WORLD

THE term 'smart cities' is highly debatable, as different people perceive it differently. The only consensus reached on the term till date is with respect to the use of information and communication technologies (ICT) in developing smart cities. It is believed that technological advancements and deployment of information systems will help in transforming today's cities into smart cities. ICT will act as an enabler by making the basic amenities of a city accessible and their delivery efficient, monitoring energy consumption and helping cities to adopt sustainable urban management. Many cities across the globe have already incorporated smart components in their city's infrastructure. They have integrated or replaced their physical resources with intelligent information technology systems to improve the quality of life and reduce environmental footprint. Many studies and rankings have been done to understand and identify the best smart cities of the world. The criterion remains the same where factors such as quality of life, digital connectivity and innovation were mapped. The idea has been to map the smart cities and understand their successful development models. Based on it, some of the top smart cities in the world can be listed as follows:

Vienna: Today Vienna is an ideal place to live and work and is listed as one of the world's best smart cities. The city has adopted sustainable and intelligent solutions for daily life to improve its living conditions and manage urban energy systems. The mayor of Vienna drafted the 'Smart City Wien Framework Strategy' in 2011 to manage the urban challenges of the city and help it to become competitive across the globe. The framework addresses all the major

themes of city administration such as energy, mobility, and infrastructure. It also uses a stakeholder process to involve all the segments of the society ranging from citizens, enterprises, non-profit institutions and the public sector. It comprises of a comprehensive approach by focusing on radical resource preservation, productive use of innovations and offering a high and socially balanced quality of living. As of now, the city has been able to successfully implement the integrated mobility concept 'SMILE' as a part of its action plan. SMILE stands for Smart Mobility Info and Ticketing System Leading the Way for Effective E-Mobility Services and is a common mobility platform that provides all the necessary information about public and individual mobility services to customers.

New York: New York as a city has always been a center of innovative technology and home for various digital companies. The city has used new science and sensor networks to connect its people while they work, travel or are at home. It is further gearing up after being featured as a part of the White House's announcements on smart cities in 2015. As a part of which, the city will create a series of neighborhood innovation labs across the five boroughs of Manhattan, The Bronx, Queens, Brooklyn and Staten Island.
The city has already been implementing smart solutions since 2009 such as preventing fires by setting up IBM Business Analytics Solution Center. It is working on projects such as LinkNYC (providing fast and free Wi-Fi network), The Subway (Upgrading the Subway system with communication-based train control (CBTC)) and NYC Connected Communities (increase computer centers in the areas with high poverty level). Another big project being considered is the Lowline (world's first underground park which draw its energy from solar technology).

London: London has been using technological innovation to shape the quality of life for its inhabitants and also create more jobs and opportunities. The various linkages created between its different urban systems are helping the city to become more livable, inclusive and accessible.
As per an estimate , London's population will grow by a million from 2011 to 2021. Therefore, it is vital for the city to use technical expertise to build its capacities and innovate new models that support its growth. The city had prepared 'Smart London Plan' to better service its inhabitants and offer a 'smarter' London experience to all. Moreover, strengthening the inclusion strategy for key stakeholders, building a platform to make public data open and accessible and using its research, technology, and creative talent creatively. The city has also joined "Smart Cities and Communities Lighthouse" initiative of the European Union, which will test a variety of projects based on technology that can then be implemented across the region.

Barcelona: Barcelona has been harnessing its technological innovations to foster the personal and business development at multiple levels. It is solving its specific city level challenges by using sustainable practices and involving the citizenship in a participative way. One of the key examples is the way it has pioneered in the low carbon solutions. The city is the first European city to pass an ordinance to install solar rooftops in all new and renovated big buildings, irrespective of them being private or public. As a successful model, nearly 70 other Spanish municipalities have followed the footsteps and installed solar PV panels, which has tremendously reduced their carbon intensity in electricity.
The city has also prepared 'Barcelona's Smart City Strategy' to efficiently manage its various projects and integrate them with technology to enable holistic social, economical and environmental development. As a part of the strategy, there are nearly 122 operational projects covering 12 areas of city management such as environmental, mobility, water, public space and open government, etc. Now as the next step, the city's authority wants to transform Barcelona into a productive and eco-efficient region with high-speed interconnected IT infrastructure.

COVER STORY

OUR SMART CITIES VS PENETRATION AREA WASTE MANAGEMENT

THE mere thought of having smart cities in India makes us inadvertently compare the same with the global smart cities. It also raises a series of question like will they have a bicycling culture or how successful are they going to be with respect to cleanliness and technological efficiency? A lot of research work and planning is being carried out to answer these inquisitive questions. The Smart Cities Mission, which has been conducted in several phases, has gradually made the picture clear about the smart cities of India and about their capacities to adopt the features of a smart city.

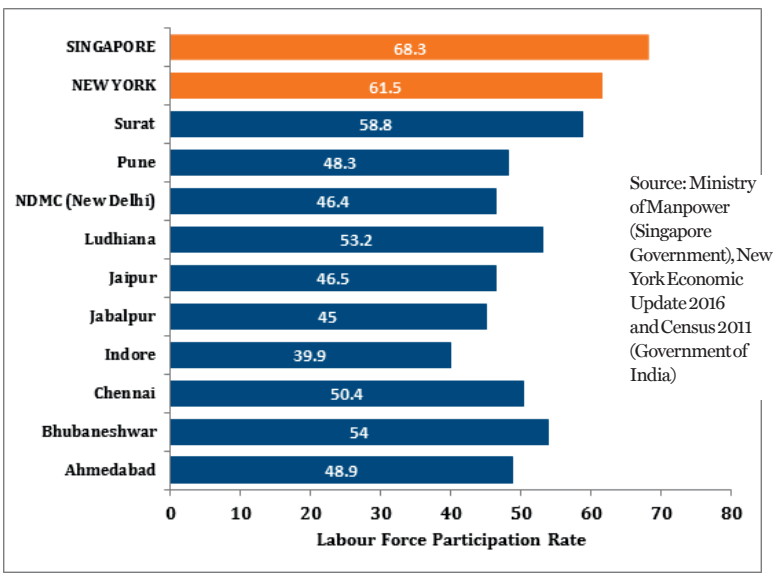
To better understand the present situation of selected 20 smart cities, we have mapped them with Singapore and New York, which are the global smart cities. We have taken these two global smart cities to be the benchmarks because of their better quality of life, high rate of citizen participation and technological innovation. Now to create a leveled comparison ground, the performance of these cities is measured on three vital parameters – employment opportunity, penetration of technology and efforts being made to clean the environment. These parameters will provide insights about the preparedness, accountability, and the need of effective mechanisms for Indian cities.

This study will provide a bigger and better picture about the urban realities of these cities. It will be a good exercise for these cities to understand their development with respect to other Indian cities, if not global smart cities. The gaps not necessarily imply the under-preparedness of these cities instead it might be the case that the cities have other priorities to cater at this juncture. The city authorities might be working on this area simultaneously, and its results will be visible over a period.

In other words, this study has selected three baseline indicators to compare and understand the present progress of selected 20 smart cities. It will try to find the gaps when compared to global smart cities, which can then be taken care of in policy interventions as and when needed.

Employment opportunity was one of the key deliverables as per the concept note of smart city released by the Ministry of Urban Development in 2014. According to it, people migrate from one region to another to access better employment prospects to eventually gain a better quality of life. Therefore, the first parameter on which the performance of cities is assessed is labor force participation rate.

Employment Opportunity – Labor Force Participation Rate



Source: Ministry of Manpower (Singapore Government), New York Economic Update 2016 and Census 2011 (Government of India)

The graph above indicates that most of the selected cities have a low labor force participation rate in comparison to the global smart cities where the lowest is of Indore. Now since these cities are still in their transformation stage of becoming

GLOBAL CITIES: NET OF CONCERN, SOLID ON COURSE HERE

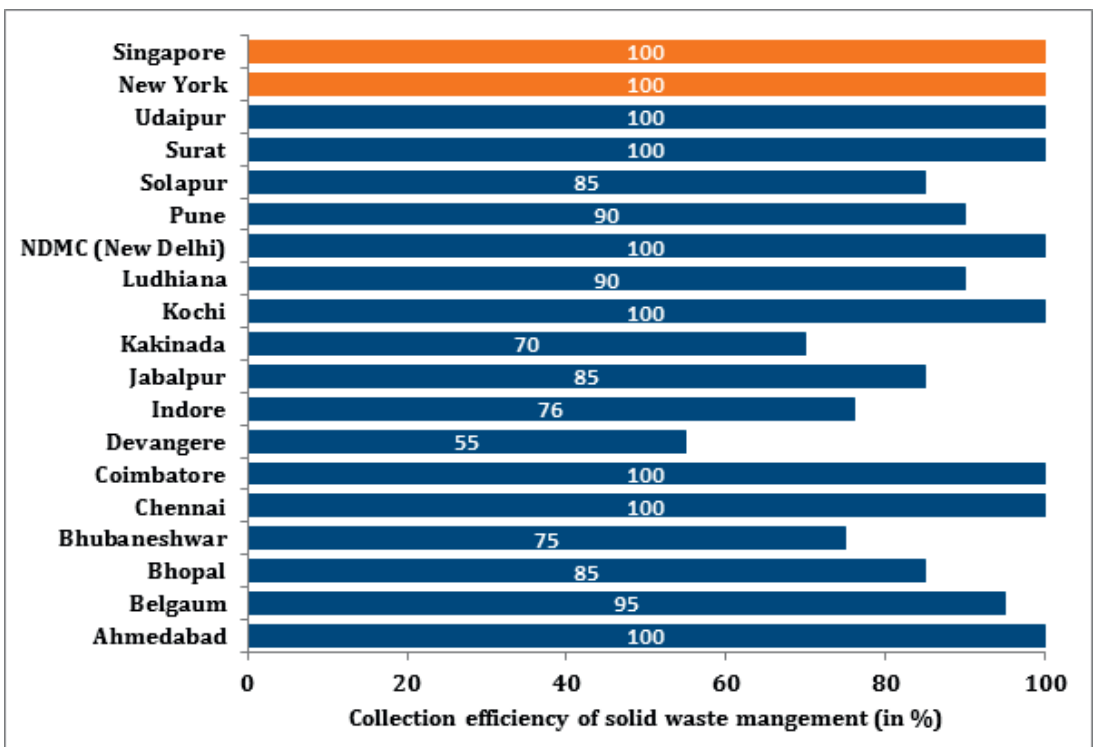
Definition of Labor Force Participation Rate (LFPR): Labor force particiaption rate is the proportion of the population ages 15 and older that is economically active. In other words, all people who supply labor for the production of goods and services during a specified period.

- The World Bank

the smart cities so it can be anticipated that they will be able to do better with time. Also, the makeover into smart cities will certainly require more people who can handle the various operations in the technical and managerial area. Another important parameter for a healthy quality of life is the presence of clean environment and with the increasing pollution levels, it becomes a prerequisite to take care of it timely. Now efforts are being made to control the pollution levels. So here collection efficiency of solid waste management has been taken as a parameter to map the performance of cities because neglecting waste management can lead to unhealthy neighborhoods.

The graph shows that most of the Indian cities have an efficient solid waste management similar to the global smart cities. Bhubaneswar, the city, which was ranked first on the list of 20 smart cities, however, has a

Clean Environment – Collection efficiency of solid waste management

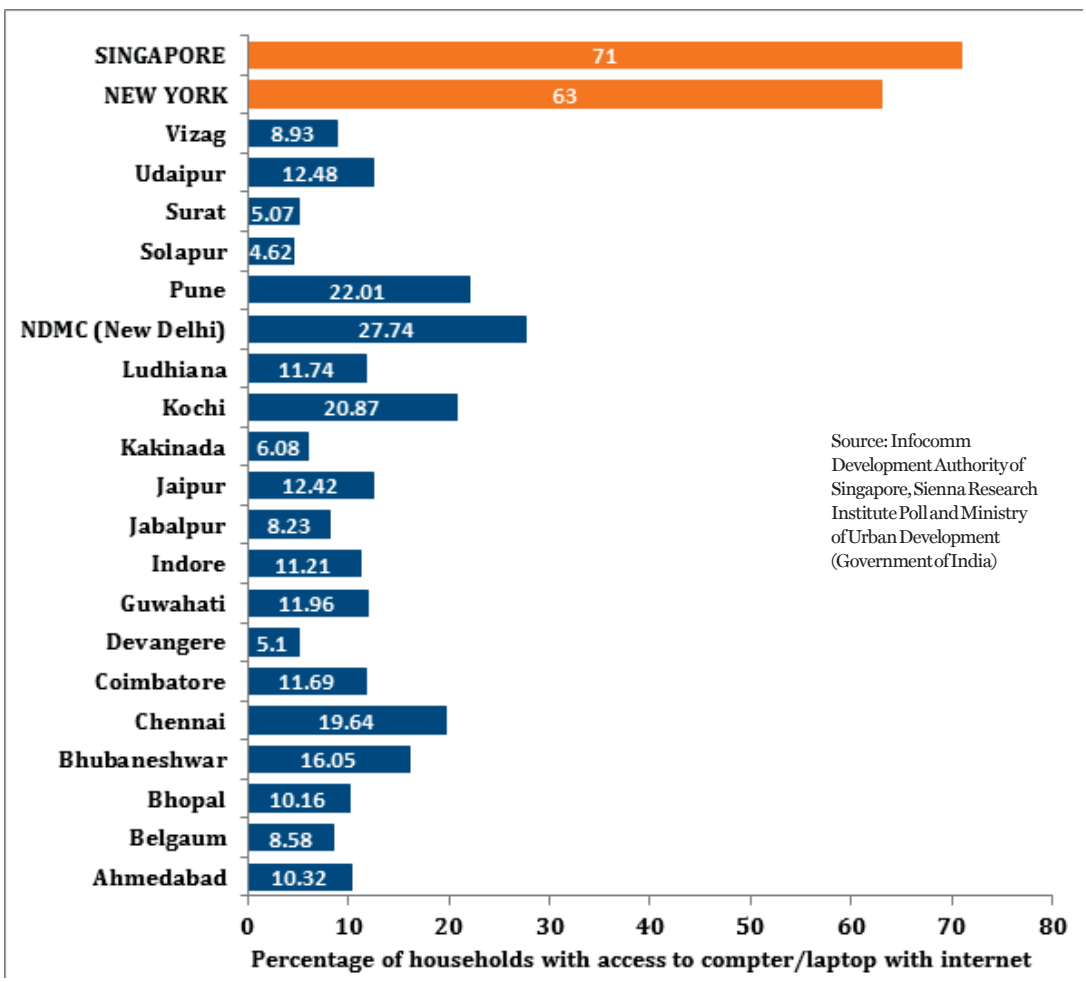


Source: International Enterprise Singapore, NYC Mayor's Office of Sustainability and Ministry of Urban Development (Government of India)

collection efficiency of only 75%. On the other hand, cities like Ahmedabad, Chennai, Coimbatore, Kochi, NDMC, Surat and Udaipur have 100% collection efficiency and are providing door-to-door services to collect the solid waste. It can be interpreted that the cities are making more efforts after the onset of 'Swachh Bharat Abhiyan.' The ranking being released under the mission has given them the boost to perform better and reach a new milestone.

The next parameter on which selected smart cities are measured is penetration of technology. Since technology will be the core component of the smart cities, therefore, it becomes crucial to identify its presence and its impact. It has been assessed by looking at the percentage of households who have access to a computer and are using the internet on it.

Penetration of Technology – Percentage of households having computer connected to Internet



Source: Infocomm Development Authority of Singapore, Sienna Research Institute Poll and Ministry of Urban Development (Government of India)

It is sad to note that none of the selected 20 smart cities have a very high penetration of technology when it comes to using the internet on computer or laptop. Households in Singapore and New York are three times more connected to the Internet on either computer or laptop in comparison to Indian cities. However, NDMC, Pune, Chennai and Kochi, which are considered as the mega cities of India, have at least 20% connected households. On the other hand, Devangere, Solapur, and Surat have merely 5% connected households. It can also be interpreted that these cities certainly have a low rate of Internet penetration on computer or laptop, but they might be using it on smartphones etc., which is not reflected by these figures. The scenario points out to the fact that technological connectivity still has to reach in these cities to help them make their operations integrated and efficient.

column

SUSAN ZIELINSKI
Managing Director of SMART (Sustainable Mobility & Accessibility Research & Transformation) at the University of Michigan

INDIA'S MOBILITY CHALLENGES, A BIG OPPORTUNITY

"Smart City" is a term that can mean nothing and everything. So before committing to a giddy embrace or a brash rejection it helps to apply the concept to some real world scenarios just to see how it all really happens - for people, for cities, and for economies.

For example, how do people meet their daily mobility needs in a smart city? Do they have to struggle interminably through unbearably congested, noisy, and polluting traffic? Do they have to watch their loved one suffer a heart attack as the ambulance sits caught in gridlock five miles back? Or can they flow seamlessly from train to bus to auto rickshaw or Ola, informed all the way by their mobile-based journey planning and fare payment apps? Or do things come to them directly via services like Flipkart at the Doorstep? Or can they eliminate their trip altogether thanks to tele-work, tele-commerce, tele-medicine, or tele-education?

When smart technology first met new services and business models, transportation began to morph into a new mobility, or "Mobility-as-a-Service" (MaaS) -- perhaps one of the more tangible and practical manifestations on the smart city agenda. New disruptive enterprises emerged globally, and new technology development even began to outpace policy making.

MaaS moves to catalyze new business models for new or enhanced modes of transportation from bus to car to train to air to a bike. They also offer new on-demand and shared services, new information technologies for integrated fare payment, wayfinding, traffic management and security. In addition to new and nimbler infrastructures to support seamless, door-to-door, multi-modal, sustainable transport systems for all types of users.

There is no question India's exponentially increasing traffic-related problems are due in large part to its recent urban and economic growth. As in other emerging economies, Indian cities are literally being run over by their own success not only in terms of quality of life but also economically -- productivity lost due to transport-related challenges and reduced competitiveness being only the tip of the iceberg.

But the good news is that the sheer scale of smart mobility systems and solutions needed to address the significant mobility challenges emerging as the world urbanizes could well translate into one of the fastest growing market opportunities since Silicon Valley.

The Global New Mobility industry cluster first identified back in 2002 as a multi-billion dollar concern has since been re-evaluated by an order of magnitude to the multi-trillions. In other words, it's not only about fixing local transportation with local regulation and local innovation. It's now a major export opportunity for the regions and nations that can adapt and apply their talent and resources to supplying next generation transportation systems and solutions for those beyond their shores.

The scope and diversity of the emerging New Mobility industry is vast. Despite Uber's ubiquity in the global public eye, it still only represents a fragment of the current market. And "Mobility-As-A-Service" (MaaS) approaches are now showing up in regional and national economic and industrial development strategies, not just transportation plans.

INDIA GETS A HELPING HAND, FUNDS

INDIA'S ambitious mission to develop 100 smart cities is estimated to be a part a USD 1.5 trillion global market opportunity. It is a great opportunity for India and other countries to collaborate and lend support to create smart cities in one of the fastest developing countries in the world. It will not only open new avenues of businesses but will also bring in the expertise of leading foreign players who have a successful track record in smart city formation.

The Government of India has allotted INR 50,000 Crore for the 100 smart cities project. According to the proposed plan, each city will receive INR 500 Crore in total over a period of five years. However, the fixed amount is being supposed to be insufficient since the cost of development is estimated to be much higher. The Government, therefore, eased the norms for foreign direct investment with respect to investment in smart cities in India. It is actively welcoming support of other countries and private players to create a 'win-win' situation for all.

Since the announcement of the mission, several countries have offered monetary and technological support to India. They seek to help India in developing a sustainable economy. The countries that have collaborated with India are shown in the table on page no 23.

Many countries have already started transforming their proposed plans into actions in their selected cities. For instance, the government of Singapore had presented the Master Plan for Andhra Pradesh's new capital Amravati to Chief Minister N Chandrababu Naidu in July 2015. Likewise, the first phase of SmartCity Kochi, which consist of the largest IT hub in the country, has been inaugurated in February 2016. The trend clearly indicates that India is about to witness remarkable development in the years to come, which will make our cities resilient and vibrant.

The exchange of knowledge and expertise from various countries will help city's authorities in India to identify what suits them best. They will also be able to acquire new learnings in the process like cycling culture from Netherlands. Lessons can be taken from other successful models of cities such as the concept of congestion pricing from Singapore. However, they should not be blatantly imitated instead they have to be tailor made to meet the requirement. Our future smart cities should stay focused and try to carve out its image of a world-class smart city.

TIMELINE – COUNTRIES WHICH HAVE TAKEN CONSTRUCTIVE STEPS TO HELP INDIA IN DEVELOPING 100 SMART CITIES

Date	Country	Support
August 30, 2014	Japan	Signed an MoU to develop Varanasi on the similar lines of Kyoto
November 6, 2014	Singapore	Partnered with India to develop new smart satellite city and a new capital for the state of Andhra Pradesh
November 6, 2014	Russia	Signed agreements to set up a Smart City on the Delhi-Mumbai Industrial Corridor (DMIC).
January 26, 2015	United States Trade and Development Agency (USTDA)	Signed agreements to provide technical and financial assistance to develop Allahabad, Ajmer and Vishakhapatnam
January 29, 2015	Germany	A six-member joint committee was set up and given a task to identify and adopt three Indian cities in the next three months
March 27, 2015	Canada	Provide expertise in building smart cities in the states of Telangana ad Andhra Pradesh
April 10, 2015	France	Announced to invest 2 billion euros in India and help in developing three smart cities, including Pondicherry and Nagpur
April 27, 2015	Spain	Submitted a Draft Memorandum of Understanding for cooperation in developing smart and sustainable cities in India. They offered assistance to develop Delhi as the first global and smart city in India
May 18, 2015	South Korea	Offered USD 10 billion to build infrastructure projects in India, including smart cities, railways, power generation and transmission
October 14, 2015	Sweden	Collaborated on several urban initiatives with main focus on sustainable waste management. They will help to develop Mumbai as a 'smart city'
October 16, 2015	Malaysia	Offered to invest USD 24 billion to redevelop Delhi Railway Station and its surrounding area. In addition with developing Garhmukteshwar situated in Uttar Project
November 20, 2015	UK	Selected Pune and Amravati from Maharashtra and Indore from Madhya Pradesh to develop them as 'Smart City'
January 22, 2016	China	Top companies from China signed eight MoUs to set up a USD 10 billion industrial park and smart cities in the state of Haryana
February 20, 2016	UAE	Launched SmartCity Kochi, which is a joint venture between Dubai Holding's Tecom Investments and the government of Kerala
February 25, 2016	Australia	Provide aid in developing Tirupati and Nellore
March 7, 2016	Germany	Announced its support to help in developing Bhubaneswar, Kochi and Coimbatore

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SOME SOLUTIONS TO PROBLEMS OF CITIES IN INDIA

SOLUTIONS drive the modern economy. Entrepreneurs, governments, and the broader civil society are behind the workings of a modern solution based economy. Smart, efficient solutions can solve a lot of problems people face. Several times the solutions require a concerted out of box thinking approach to looking at the problems that people face on a day to day basis.

Take the example of Hubli, the second largest city of Karnataka located in the northern part of the state. It is known for the large number of Micro Small and Medium Enterprises located in and around the twin cities of Hubli-Dharwad. The average annual rainfall for the region where Hubli lies is close to 772mm versus India's average annual rainfall of 1035mm . Also, the growth of more people over the years according to the census has meant increasing constraints on resources like water. Water has been a critical issue for the city as well as nearby areas are dependent on the water supply from rainwater and other surface water sources for taking care of daily needs. The provision at times has been erratic.

To utilize technology for efficiently solving the inconsistent water issue Hubli City partnered with NextDro , a Bangalore-based civic startup, which developed a system to alert residents about the availability of water. Valve-men first while turning the water notify an automated system as to when are they going to release water for a neighborhood. The system sends information to NextDrop, which in turn sends a text message to residents as the residents have subscribed to a 10-rupee service that water would be available within 30 minutes. Overall 25000 thousand households have registered and received updates regularly on when water is expected to be available. It has reduced the inefficiency and resulted in better information symmetry between residents and the water providing authority.

Another pertinent example of solutions' approach is that of Vishakhapatnam, which is the biggest city of Andhra Pradesh both in terms of area and population. The Greater Vishakhapatnam Municipal Corporation is one of the oldest Municipal Corporations in Andhra Pradesh. Property Tax nationally forms the basis of 25-30% revenues that Municipal Corporations earn. In Vishakhapatnam, the previous Urban renewal mission had mandated for reform of the property tax collection system.

Accordingly, the city began following the Annual Rental

Value System to calculate property tax by a building's type and tax zone. To improve tax collection, the city also introduced a new web-based tax assessment system. The city also created a database of properties using GIS technology and enhanced its data collection by going door-to-door. The results of the intervention were that in 2013-14, the total number of properties registered rose 11 percent to 4,14,123, and a 100% coverage than the year before. The property tax collection efficiency also increased to 85% in 2013-14. The collection of tax revenues from property taxes doubled from INR 77.85 Crore rupees in 2010-11 to INR 144.33 Crore in 2013-14. This was the proactive approach by government to better systems for greater efficiency.

The third example is that of Surat, which is a city located in south Gujarat and known for its diamond merchants and its cotton mills. However, only a few people now remember that the city suffered from an outbreak of Bubonic plague in 1994 . That plague caused some 56 to die, and some 2,00,000 flee the city. Post the plague, SR Rao a 1978 Gujarat Cadre officer took charge. He identified the problem and suggested solutions. His first step was to understand the problem by going on the field. Post his taking over it was ensured that roads and markets were cleaned, fines were imposed on people who littered on the streets, and the city was divided into 52 'Sanitary wards' each with its own cleanliness inspector. The overall problem understanding and a solution based approach enabled Surat to be rated as the second cleanest city in India (one place behind Chandigarh) by the INTACH survey of 1997. Post this the city continues to be looked upon as one of the best places for cleanliness, sanitation, and livability in the country.

So broadly speaking, what insights do these case examples offer. First, that technology can be used in ways that can help improve efficiency and solve common problems that people face. Second solutions often require the mixture of technology and door to door social campaigns to make a meaningful impact. Lastly, personal leadership is also an important driver for bringing change. Personal leadership along with a desire to solve real-world challenges can be the driving force behind the improvement in people's lives. These three principles should be the driving force behind effecting change.

column

KEVIN STOLARICK
PhD. Stolarick is also known as the "Official Statistician of the Creative Class"

HAVE YOUR OWN SMART SOLUTIONS

I love cities. I love the cities of India. Having studied them and having visited over 35 of them across all parts of the country, the rich tapestry that is the diversity of India's people is reflected in Bharat Mata's cities. Cities and urbanization can drive prosperity. They can also create tremendous concentrations of poverty and exacerbate growing inequality. While I am a staunch believer in and champion for increasing urbanization to increase prosperity, it must be done with care and consideration. From everything I have seen so far, India's current smart cities initiative fails on two accounts. First, the priorities are wrong. Second, it is pursuing "foreign" solutions when it should be creating its own. Unless a more careful and nuanced approach is taken, the initiatives risk becoming little more than a massive spending program whose only impacts will be measured by the amount of money spent.

Priorities

The apocryphal story from when I was at Carnegie Mellon University and the Computer Science faculty was advising Bangalore on how it could become an ICT and business services hub was "first, you need reliable power". The same could still be said today for pretty much every city across India. Toronto was recently named the number one city by the Intelligent Community Forum* which bases its decision on a series of intelligent community indicators: knowledge workforce, innovation, digital equality, sustainability, advocacy, and broadband access; and two factors: collaboration and leadership. I bring this up not because I live in Toronto or because I played a (very, very small) role in Toronto winning the #1 designation, but because I think this offers a reasonable, well-accepted approach to what constitutes a "smart city". Notice that the list doesn't include reliable power or safe drinking water. A coalition of states recently announced that they were going to have 400 cities and towns free of open defecation by the end of 2016.

I point this out only to highlight the severity of the challenges of creating smart cities when the fundamental and basic infrastructure isn't in place. How can effort be meaningfully applied to broadband access and digital equality when the power is off for 6-8 hours every day and the water isn't safe to drink, often because open defecation is such a problem? As Maslow defined for individuals, cities too have their own hierarchy of needs. And, just as it's hard to be "self-actualizing" if you are hungry or unsafe – how can you become a "smart city" if you don't have the basic infrastructure in place? While creating smart cities is a laudable goal, getting there requires, first, careful thought about the priorities for the absolutely necessary and underlying infrastructure and conditions.

"Make in India" Solutions

Developing smart cities in India is more than taking ideas from Munich, Tokyo, Seoul, or Silicon Valley and applying them to cities in India. On only has to look at Le Corbusier's wonderful but European city of Chandigarh and its neighbors, Panchkula and Mohali, to see that European solutions may not make the most sense in an Indian context. While Chandigarh remains locked in Le Corbusier's vision of what a city should be, the neighboring cities see the exuberant and often messy, less structured and less controlled growth so much more typical of cities around the country. One only has to look to the famed pink city of Jaipur to find that Vedic and Indian principles can be applied to city building in a way that can create a city that has smartly thrived for nearly two and a half centuries. Of course, that is nothing compared to Varanasi, which has prospered for millennia as the oldest continuously, occupied city in the world.

The world needs "Make in India" solutions for cities and urbanization. India does not need the solutions from the rest of the world.

COVER STORY

THE WAY FORWARD:

LET'S BUILD ON OUR STRENGTHS

INDIAN cities are at the cusp of smart transformation. They are getting ready to face urbanization as an opportunity rather than a challenge by aligning their capacities with their visions. Every city has a different reality and needs to be resolved it with tailor-made solutions. The same has been made clear in the proposals of the 20 selected smart cities that Indian cities are now setting measurable and feasible goals in their action plans. They are preparing to emerge stronger than before to withstand the challenges of the 21st century like air pollution and service failure of essential amenities. Efforts are thus being made to incorporate 'smart' and 'innovative' elements in the landscape of existing cities.

As the next set of steps, cities are first required to develop their own benchmarks around the areas of needs and opportunities. The idea behind is to make them assess their progress on a yearly basis and engage citizen in the process. It will help in identifying the gaps in details and will also create new solutions, which can be coupled with technology to boost the performance of service delivery. The process is extremely popular in the developed countries where citizen participation is at the core of urban development and management.

Secondly, a critical mix of hard and soft infrastructure has to be incorporated in Indian cities to develop and make them competitive. Hong Kong and Kula Lumpur are some of the best examples of cities that have focused on developing their strengths of their utilities and land development. The balance between these infrastructures certainly helps to push the local economy into further specialization, which will eventually nurture creativity and boost innovation.

Thirdly, research and technological innovation to manage the areas of human life such as housing, public transport, water supply and waste disposal need to be pursued. Since technology will be the core element of all future initiatives so, the systems have to integrate in a way that they operate coherently in response to the user's requirements. There should be synergy between the various urban components to enhance the quality of life of the city.

Lastly, it is imperative that they successfully implement their action plans to set an example for other cities. The 20 smart cities have already promised to build better public transport, encourage pedestrianisation, provide hassle-free civic services and safety against natural disasters, etc. So expectations are high for the first set of Indian smart cities because the process has already gained momentum, and smart cities can be the real change agents in developing country like India.

ABOUT TEAM

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DUBBED as the "Official Statistician of the Creative Class", Kevin Stolarick, PhD, combines a depth of knowledge with an appreciation of the importance of finding and sharing the knowledge or "pearls of wisdom" gained from his comprehensive understanding of the Creative Class and the Creative Economy. He has taught numerous courses in Statistical Analysis, Information Systems and Regional Economic Development. His research includes primary development of measures, indicators, and benchmarking approaches with significant impact on the growth and development of the Creative Class and Creative Economy theory. Kevin is one of the few statistical analysts who has the complete works of Edward Tufte and Donald Norman on his shelves.

ABOUT INSTITUTE FOR COMPETITIVENESS

Institute for Competitiveness, India is an independent, international initiative centered in India, dedicated to enlarging and disseminating the body of research and knowledge on competition and strategy, pioneered over the last 25 years by Professor M.E. Porter of the Institute for Strategy and Competitiveness, Harvard Business School (ISC, HBS), USA. Institute for Competitiveness, India works in affiliation with ISC, HBS, USA to offer academic & executive courses, conduct indigenous research and provide advisory services to corporate and Government within the country. The institute studies competition and its implications for company strategy; the competitiveness of nations, regions & cities; suggests and provides solutions for social problems, Institute for Competitiveness, India brings out India City Competitiveness Report, India State Competitiveness Report, India Economic Quarterly, Journal of Competitiveness and funds academic research in the area of strategy & competitiveness.