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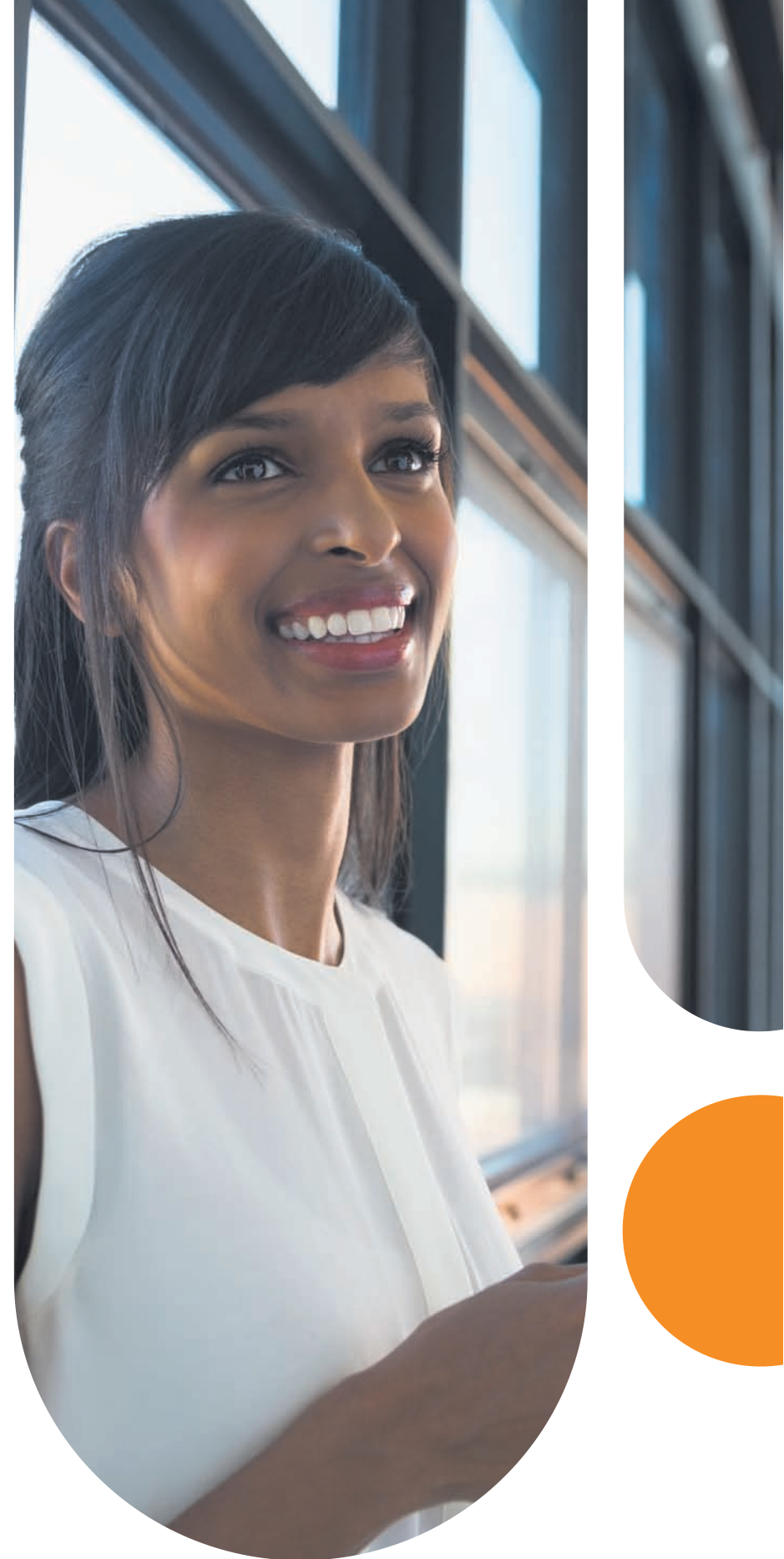


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THE RISE OF SMART CITIES

From building cloud-based command centres to using IoT to monitor water consumption, Indian cities are experimenting with emerging technologies



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How India is building cities of the future



As a country, India faces several challenges. Be it the continued issue of traffic congestion in cities like Bengaluru, or flood situations in states like Assam, India's challenges with respect to infrastructure are complex. That said, some cities have taken some pioneering initiatives and showing the way to other cities on how technology can be effectively used to solve infrastructure related challenges using the power of technology: The Bangalore Metropolitan Transport

“Many cities in India have taken the lead in using technology intelligently to create smarter cities

Corporation (BMTC) , for example, is trying to ease commuter woes by implementing an Intelligent Transport System. BMTC wants to make public bus travel easier by using GPS to predict the expected time of arrival at a particular bus stop, knowing Bengaluru's chaotic traffic problems. What's more, an app will let you select a bus with a live tracking feature – similar to what you would expect in an Ola or Uber.

For states which perennially get flooded, Guntur's example is noteworthy. The city is using drones to create flood inundation models as the traditional

method for mapping areas which are inaccessible and difficult to survey is challenging. The city hopes to produce a simulation of terrain which is prone to flooding and devise measures to prevent the same. For example, an analysis could possibly identify locations for planning better drainage systems and also help sectors like agriculture in preventing damage by better forecasting flood patterns.

Another smart project is an IoT-based project that the Jamshedpur Utility Services Company (JUSCO) is undertaking, to implement the world's first integrated city management project using Low Power Wide Area Network (LPWAN). JUSCO aims to digitize and monitor street lights, utilities and parking meters, using more than 1,00,000 sensors. The significance of the network is that the network of sensors is used by the organization to use technology to make smart use of resources. For example, sensors can be used to monitor which trash bins are getting full, or for monitoring flow of liquid inside drains. When a particular threshold gets crossed, an alert can be sent to a command centre. The Rajkot Municipal Corporation is looking at deploying geo fencing technologies to alert authorities in case of encroachment takes place at any of the government owned lands. The Haryana Government has decided to use drones to keep a check on illegal construction or encroachment on government properties.

As these examples show, many cities in India, have indeed taken the lead in using technology intelligently to create smarter cities. If these cities succeed in their initiatives, then one can expect cities to compete with each other to uplift the life of the common citizen.

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THE RISE OF SMART CITIES

From building cloud-based command centres to using IoT to monitor water consumption, Indian cities are experimenting with emerging technologies

One of the key focus areas of the government's ambitious plans for transforming India is the Smart Cities Mission. Smart Cities themselves involve a plethora of crucial points such as water and sanitation, transportation and road safety and more – all of which are adopting smart solutions, thereby bringing Informations and Communications Technologies (ICT) into play.

The rapid urbanisation and the growth of urban population is adding to the need of Smart Cities. India's urban population is projected to grow to about 600 million (40 percent) by 2031 and 850 million (50 percent) by 2051. Rapid

urbanisation also brings challenges, including meeting accelerated demand for basic services, infrastructure, jobs, land and affordable housing, particularly for the urban poor. This is where ICT solutions can come handy.

The Swachh Bharat mission, which is essentially linked to the vision of Smart Cities, aims to make India free from open defecation and achieve 100 percent scientific management of municipal solid waste in 4,041 statutory towns and cities. This is where the waste management and sanitation part plays a significant role.

According to a March 2017 publication by the Ministry of Urban

Development, a total investment of 1,33,367 crore has been proposed by 60 cities under the Smart Cities plan. The sources for these fundings include private investments, central government funding, state government share funding convergence, and other sources.

As per a Smart Cities Council India's report, Greater Chennai Corporation has decided to produce electricity from non-degradable wastes in a major step ahead in making Chennai 'zero-waste' city. The non-degradable waste pose severe environmental and health issues. For this, the Greater Chennai Corporation is setting up two power

plants in Chennai to generate about 64 MW of electricity per day. Similarly, Chennai Metro Rail Ltd (CMRL) is leveraging upon a plethora of ICT solutions to achieve its desired goals.

In terms of road safety and mobility, Hyderabad has identified the need to control the traffic through signalling systems and is now planning to go for a free-flow of traffic. The city is going for strategic road development plan, thereby reducing pollution and travel time. Additionally, Hyderabad is working on junction improvement, alongside widening of roads and constructing flyovers.

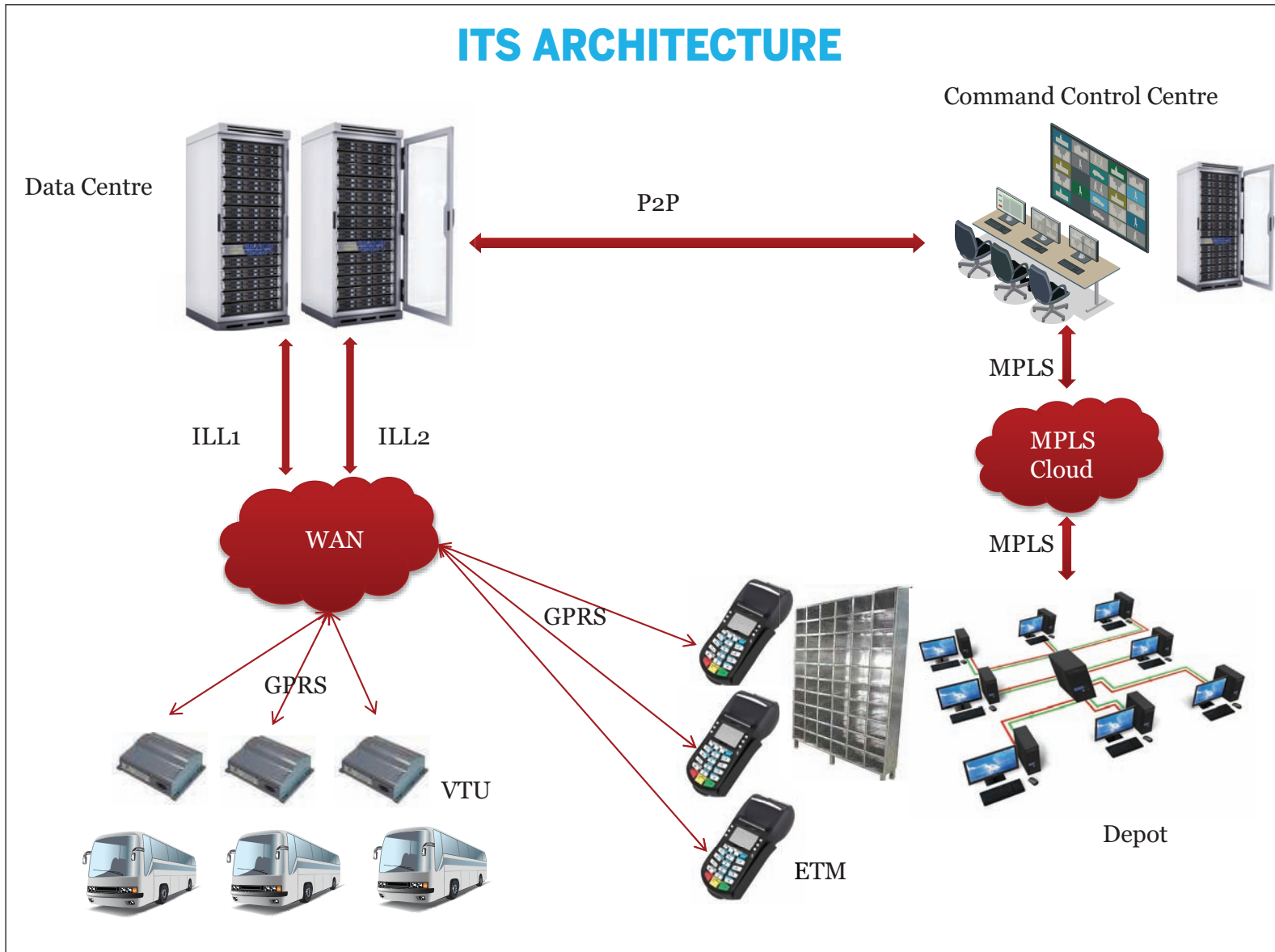
The government's flagship Smart

Cities mission is aimed at providing an enhanced quality of life and economic opportunities with efficient infrastructure. While the government has stepped on the accelerator for Smart Cities by announcing 109 smart cities, it is crucial to learn from the best practices of cities which have been successful at their efforts. The second edition of Smart Infrastructure Symposium, organized by *Express Computer*, elaborated the roadmap for Smart Cities and highlighted the best practices and success stories of smart cities, through its various insightful sessions and panel discussions.



Bangalore Metropolitan Transport Corporation's experience with Big Data

BMTC PRODUCES ONE billion rows of data each month; Since implementing the ITS in June 2016, IIM Bangalore has amassed 15 billion rows. The public transporter has partnered with IIM Bangalore for managing the data generated to devise ways to coin better services for the passengers and enhance revenue



Prof. Shankar Venkatagiri, Dept. of Decision Sciences & Information Systems, IIM Bangalore



Nagendra N, Chief Systems Manager, BMTC

The Indian transportation industry is growing at a CAGR of 15 per cent with the total budget allocation for the sector pegged at ₹4 trillion. Given the Government's focus on Smart Cities, the total outlay on Intelligent Transport System (ITS), which will have an important bearing on the overall transportation sector, will also be huge. Smart transportation is an integral part of the project report provided by smart cities across India. Bengaluru Metropolitan Transport Corporation (BMTC) has implemented an Intelligent Transport System (ITS). The scope of the ITS is one of the largest among the ITSs implemented by other smart cities in India.

The objective is to induce a shift in the travel patterns of the citizens from private transport to public transport, which is the need of the hour. It will not only help passengers with comfortable and reliable transport service but also increase ridership thereby increasing revenues for BMTC. It is a win-win solution for all. The ITS comprises of three main components: Electronic Ticketing System (ETS); Vehicle Tracking System (VTS) and Passenger Information System (PIS).

Intelligent Transport System (ITS) at BMTC
A Central Control Centre (CCC) has been established for the ITS at the BMTC

central office in Shantinagar, Bengaluru. It is a 20-seater centre monitoring 6,500 buses. The ITS is one of the projects in India to have the largest impact to citizens, as BMTC has a ridership of approximately 5.2 million per day (Bengaluru has a population of around 10 million). The scale of deployment is also one of the largest in India, with over 1,000 online Electronic Ticketing Machines (ETMs) and more than 6,500 Vehicle Tracking Units (VTUs). "The monitoring helps us to catch bus route skipping and deviations. This information is then passed on to the concerned authorities," says Nagendra N, Chief Systems Manager, BMTC. The bus before leaving the depot is mapped to the ITS using a GPS. Every ten seconds, the data is relayed to the central server. The bus is tracked for the scheduled route it is supposed to take. The commuters standing at the bus stop can check the status of the bus on the mobile app; Public Information Display (PID) on the bus stands. The communication device is also provided for both the driver and the control room to contact each other.

The role of big data
While the bus tracking enabled services are useful, the real benefits lie in how the data generated on a daily basis could be used to make the best and intelligent use of the bus services. Not only to serve the customer better but

also revenue generation for the public transporter. BMTC has partnered with IIM Bangalore for managing the data generated on a daily basis. The B-school also suggests data tools and how can it be used for enhancing customer service and revenue generation. The data can also be shared further with many private players and government agencies.

BMTC produces one billion rows of data each month; Since implementing the ITS in June 2016, IIM Bangalore has amassed 15 billion rows; these numbers is a reflection on the amount of data that gets generated. It is not stored in the traditional databases. "The era of traditional databases is over. We use database clusters, setup at IIM Bangalore. It allows for parallel processing of data across the 10 nodes that we have," says Prof Shankar Venkatagiri, Associate Professor, Department of Decision Sciences and Information Systems, IIM Bangalore. IIM Bangalore has the

skilled manpower to manage this modern processing. Some of the skills required are - statistical and computer science skills. The programming is all done on open source platforms like Hadoop / Hive, Spark, Python, R, Parquet.

The data on the location of the buses helps in inferring, how congested was the city on any given day; which are the points of congestion; expected time of arrival etc. "The students from IIM Bangalore come to me with the data captured and suggest, what kind of projects can i work on using this data - which can be helpful," says Venkatagiri.

It takes about three hours to get a reply after a query is shot to the database of 15 billion rows and thus there are many analytics divisions getting seeded by the students of IIM Bangalore. In terms of what more can they do with the data. Since this is Government data, a data sharing policy has been framed.

BMTC's Volvo bus service runs on just 10 per cent of the

BMTC's Volvo bus service runs on just ten percent of the routes but generates enough revenue to cross subsidise the other ninety percent of the routes. Two students from IIM Bangalore, have suggested analytics tools for BMTC Volvo

routes but generates enough revenue to cross subsidise the other ninety percent of the routes. Two students of IIM Bangalore, who also work

with an IT company have suggested analytics tools for BMTC Volvo service to help the public transporter on how can they use data and rationalise operations. They have generated tools that helps to drill down to show the revenue spread, on the basis of route, date, etc. These platforms can be designed at zero cost as they are open source and also gives an opportunity to the students to work with tons of data.

IIM Bangalore is working on improving certain areas of service delivery like passenger wait time. "We would like to mix the current data with other data sources like the meteorological data. If it's going to rain, then is there a need for extra bus services, and if yes, then on which routes," says Venkatagiri.

While there is a huge scope of improvement of the ITS at BMTC, they have taken the right direction. Aspects like using open source; deciding not to monetise the data and share it freely with other government and private

agencies; working with a Public Private partnership model and partnering with a B-School like IIM Bangalore, which gives the students an opportunity to work on data models and size, which they have never experienced before. The students also in turn design innovative applications atop the data provided to them. On a no cost basis. This will ultimately lead to a situation as explained in the quote below.

"A developed country is not a place where the poor have cars. It's where the rich use public transport" — paraphrased from Enrique Penalosa, former Mayor of Bogotá, Colombia

The article is based on the presentation made by Nagendra N, Chief Systems Manager, BMTC and Prof. Shankar Venkatagiri, Associate Professor, Department of Decision Sciences and Information Systems, IIM Bangalore, at the Smart Infrastructure Symposium 2017, Chennai

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6 | COVER STORY

“Smart Governance of internal processes is the mantra for making cities smart”

THE WORK DONE with the private sector for smart city projects will not give results without sorting out the internal system in order. The smart city projects will not come to fruition without great visioning in the government processes



Santhosh Babu IAS, Chairman & MD, Tamil Nadu Handicrafts Development Corporation, Ex-IT Secretary, and MD of ELCOT, Government of Tamil Nadu

World class governance is what bureaucrats seek for. After the launch of the Smart Cities Mission (SCM), Information Technology is perceived to be the panacea for all issues. Major IT vendors are pushing to sell their IT solutions, however at the other end of the spectrum, there are government employees who are at times, frustrated, clueless, unhappy and most of the times drudging, and trying to give their best.

“I am intrigued with how do we make Governance world class. I don't think IT is the panacea for all ills. My suggestion is the following: IIT- Integrity, Innovation and Technology,” says Dr. Santhosh Babu, IAS, Chairman & MD, Tamil Nadu

Handicrafts Development Corporation, Ex-IT Secretary, and MD of ELCOT, Government of Tamil Nadu. It's difficult to get all the three qualities together. The presence of this combination will lead to transformational leadership.

What is transformational leadership ?

Leadership is a characteristic prevalent in any entity of the society. Be it private sector, a family, an NGO or in the government, but what matters is, “Are you ‘a leader of your imagination’ or ‘a leader of your circumstance’ ? is the question that leaders will have to ask,” states Babu. To apply this statement to a country, it can always be said, India has remained underdeveloped

since Independence and will continue to be like that. As against an approach of ‘leader of your imagination’ will convert this statement to, ‘can India be made into a nation like Singapore in the next few years’.

Vision is the most important trait for smart city practitioners. Otherwise, all the running around will be a waste. Singapore had the vision to transform and it metamorphosed into a nation, which was unimaginable, if one were to see how Singapore was in the 1960s. Even Malaysia didn't want Singapore when the British wanted to decolonise Asia and wanted Malaysia to include Singapore.

Learnings from Singapore
All the residential buildings in Singapore has a built in

system that collects and manages the rainwater in such a way that it doesn't drain the city's main drainage system. The rainwater in excess is not considered as floodwater but drinking water after the necessary processing. This is in spite of Singapore having 2400 mm of rain. In all, it rains for almost 187 days / Year. Whereas Chennai has a mere 500-600 mm / year.

Hitherto in Singapore, Hawkers were all over the country. Now, after designating places for ‘Hawkers markets’, the hawkers are so organised and clean that the PM himself has breakfast at the hawker market.

Poompuhar: Case study of IT led governance
Babu completed his studies

from Harvard University and was deputed as CMD of The Tamil Nadu Handicrafts Development Corporation, popularly known as Poompuhar. The way he approached the transformation at Poompuhar encapsulates the process of visioning and implementation. The challenge in governance is the absence of implementation after a roadmap, consisting of hundreds of pages of documentation is drafted by analyst agencies. “After me joining Poompuhar, the profit jumped from 27 lakhs to 1.5 cr in two years. However the potential is a whopping 5000 cr!,” says Babu. It's a completely online organisation driven entirely on ERP. “We used to take 30 days for a procurement

decision. Now, it is done in less than 3 hours! This is the difference in making the offices ERP driven. Nobody misses Babu in the office and he doesn't miss anybody. Eight offices are covered under the ERP system. The attendance is made online. The 16 showrooms across India are monitored via cameras placed due to which Poompuhar has saved about 60 lakhs / year, because of zero pilferage, which was an issue earlier.”

iPads have been provided to 40 employees, which helps them do reviews of showrooms, to check whether certain changes have been done or not, as per the orders issued, post the visit of the CMD or the concerned person.

The paper based processes were replaced by the accounting software, Tally.

“Poompuhar is in the process of building an electronic repository of artisans,” informs Babu. Currently, there is no organised database of artisans and the middlemen connect the organisation with the artisans. There are about 900 – 2000 suppliers. None of them are artisans. In order to have a direct channel with the artisans, an e-commerce platform is being created. It will have one web page per artisan. Approximately 2 lakh web pages will be created.

Poompuhar will also create a Virtual Reality (VR) showroom. The entire product suite of Poompuhar can be viewed by wearing a VR headset. Moreover, the artifacts can be picked up and bought also using the headset.

The company is also active on social media sites; apps are made available; 3D designing and printing is used for souvenirs, for e.g. In Mahabalipuram, souvenirs of the temples are made using 3D printing. Sales related analytics tools are also used. The various cultural compositions inside the Chennai airport are designed by the edesigning solution at Poompuhar. “We have earned 35-40 cr from similar projects,”

A basic learning from the experience at Poompuhar is, the work done with the private sector for smart city will not be good without streamlining the internal system and making it work in order. The smart city projects will not come to fruition without great visioning in the government processes.

The article is based on the presentation made at the Smart Infrastructure Symposium, Chennai

Panaji set to implement Intelligent Transport System (ITS)

GOA HAS A VERY high density of vehicles. 500 / 1000 population. Every second citizen in Panaji has a car. The number of cars increase in the holiday season. Thus smart transportation is a key focus area for the city



[L-R] J Ashok Kumar, Director of Municipal Administration, Goa; Shashank Mani Tripathi, Deputy Commissioner, Corporation of City, Panaji

Panaji, as a part of the Smart City Mission (SCM) and the Atal Mission for Rural and Urban Transformation (AMRUT), is set to launch many smart projects. The Intelligent Transport System (ITS) will be the umbrella project to solve the traffic congestion issue in Panaji. The city is the smallest Municipal Corporation in India. Thus far, no major solution has been adopted for transportation, drainage or sewage, due to the financial unviability, given the smallness of the area covered.

“Panaji has planned the proposal for the rollout of smart transportation for smart city Panaji and other parts of Goa,” informs Shashank Mani Tripathi, IAS, Deputy Commissioner, Corporation of City of Panaji. Panaji's area is just 8 square kms with a population of 41000. The state will celebrate 175 years of the establishment of Panaji in March 2018.

Goa has a very high density of vehicles. 500 cars against the population of per thousand. Every second citizen in Panaji has a car. The number of cars

increase in the holiday season due to the heavy influx of tourists. The population of Goa is about 15 lakh and the number of tourists inflow on an annual basis is close to 60 lakh. The national average is 18 cars per thousand population. Thus smart transportation is the key focus area in the state. “The corporation of city of Panaji has taken a people centric approach as against other cities where the attention is more on building Infrastructure like roads and flyovers to move more private vehicles,” says Tripathi.

There are various principles on which the decongestion of the city's traffic will be dealt with:

- Creation of pedestrian environment
- Improving the public transport condition
- revising the parking policy within the city

The idea is to move the citizens from using private vehicles to public transport. The major components of the ITS includes:

Automated message signs
It will have the display of automated message signs.

“The Intelligent Transport System (ITS) will be the umbrella project to solve the traffic congestion issue in Panaji

The passengers will be notified with traffic related messages on various platforms like mobile app, Public Address system (PAS)

Automatic red signal violation detection system
Cameras will be fitted, which will detect the violation. They are integrated with the command and control system, where a ticket will be generated after every instance of a violation. The ticket will remain open until the cop or the transport authority takes action.

Adaptive traffic control system
The signals will keep changing in accordance with the traffic congestion in the respective areas. This will keep the traffic flowing.

Public address system and smart parking
The parking space will have sensors. All these components will be integrated with the command and control system. It's also the solution brought under the SCM. “We have identified ten junctions within the city where the adaptive traffic control system will be adopted,” informs J Ashok Kumar, Director of Municipal Administration, Government of Goa.

The Light Bus Rapid Transit (LBRT) system will be mapped in the ITS. LBRT will have Blue, Red and Green line, Hop On Hop Off (HOHO) buses, which will complement each other in terms of routes. The buses will be made available with a frequency of not more than 10 mins. The LBRT will also be synced with pedestrian paths and bicycle tracks. The city is also in the advanced stages of putting in a public bicycle sharing system.

The IT solutions will be packed inside the app for the citizens to identify the status of HOHO buses; identify the parking space in the city and the availability of the parking slots; the areas where public bicycle sharing is placed; the location of the pedestrian paths etc.

Chennai Metro Rail banks upon smart solutions to drive public transport growth

IMPROVING EFFICIENCIES through ICT in the endeavour to position Chennai Metro Rail (CMRL) at the forefront of city's public transport, L Narasim Prasad, Director, Systems and Operations, CMRL charts out the way forward

Mohit Rathod
mohit.rathod@indianexpress.com

With only 63 percent of Chennai's roads being two-lane, coupled with 40 percent of the city's population commuting by personalized vehicles (including and two-wheelers and cars), public transport system needs to be highlighted. While Chennai's bus network – having 834 routes and a fleet of 3,843 buses – carries the major chunk of commuters across the public transport system, Chennai Metro Rail (CMRL) is looking at transforming the city's transportation habits through effective adoption of Information and Communication Technology. Sharing thoughts on the same, L Narasim Prasad, Director, Systems and Operations, CMRL, says, "People talk about cars. For instance 50 percent of the people in Goa have cars, but the true sense comes in the meaning of a developed country. A developed country is not where the poor have cars, but where the rich travel in public transport. In this endeavour, the Chennai Metro Rail is pushing ahead to get the middle class and upper middle class people also use public transport. For this, we need to

be smart, otherwise we will be left behind."

Chennai is also known as the "Detroit of India", due the vast presence of the automobile industry. The city has a widespread rapid transit system of 19.34 kms – mostly elevated – run by the Indian Railways. However, talks are underway of its integration with CMRL. The first phase of Chennai Metro Rail will have 54.1 kms, of which, around 28 kms is presently operational.

Mobility pattern

Total number of vehicles is 4.75 million, of which two-wheelers constitute 77 percent. Prasad expresses that personal transport statistics are growing day-by-day, which can only be controlled by adopting smart technologies in CMRL. The public transport figures have been dropping year-on-year, which is alarming, adding to the pollution and quality of life. However, CMRL aims to address this problem through its network. Prasad elaborates, "This is probably the first metro rail project in the country that's connecting the major air, road and rail transport in the first phase itself."

Tech role

CMRL is leveraging upon a



plethora of ICT solutions to achieve its desired goal, such as inter-communications system in train between passengers and CMRL, which also allows communication between differently-abled passengers and the train operator, wherein the train is halted for a sufficient duration for alighting. Additionally, silent alarm has been installed for security reasons, in case of emergency situations.

Some of the other pivotal systems installed include passenger information displays and video surveillance and CCTV in doorways. CMRL currently uses 40 to 60 cameras inside each station. Whereas, the train control and monitoring systems perform control command functions of the train as well as monitoring. Driving assistance, driving aid, maintenance functions related to alarm, faults and events are also displayed and recorded.

Commenting on real time remote monitoring and diagnostics, Prasad states, "We are in the process of introducing this, and ours is the probably the first metro project to introduce this in India. The train will provide information about the working parameters of the train to the depot for the purpose of monitoring. Hence, in case of a failure online support can be provided. We are also implementing an asset management system for the train, which will track the change in components of the train. In phase two, we are looking at driverless trains. In fact, even today, the trains are running on automatic operations mode, which means we are close to achieving that. Real time remote energy monitoring systems help us to monitor the energy used by various systems. All these data analytics help us to become smart."

Operations

Alongside remote monitoring and diagnostics, CMRL is banking upon Automatic Train Supervision (ATS) for the control and monitoring of traffic, scheduling and routing of trains, regulation, time and energy, forecast for passenger information displays and announcements. Whereas, Automatic Train Protection (ATP) ensures that primary safety functions are automated, and exceeding speed limits and doors are monitored.

The recent train mishaps in India have brought the track-side faults into spotlight, and to prevent these, CMRL's interlocking systems control and monitor track-side equipment, thereby preventing uncertainties. Explaining further, Prasad says, "We are also the first to install platform screen doors (PSD) at underground stations in the first phase itself, which

ensures safety of passengers and save a huge amount of HVAC. We also have mobile app based maintenance system. Mobile apps are so cheap and accessible these days that you can do anything; all of our maintenance is mobile based including tunnel ventilation, air conditioning etc."

In a move towards adopting eco-friendly measures, CMRL's document management system ensures that all correspondence is done electronically. It also has an e-filing system for internal operations and e-procurement.

Passenger focus

Similar to Mumbai Metro Rail, CMRL has opted for smart tokens and smart cards for ticketing. However, it is discouraging tokens and is trying to urge passengers to use smart cards more. For performance and passenger data assessment, automatic fare collection system can handle huge values of data and can monitor passenger insights of each station and points.

Going forward, Prasad adds, "We are trying to accommodate common ticketing of multiple operators through common smart card infrastructure. For instance, we will give our clearing house to the bus network. We also have our own mobile app for the public, which gives a wide range of information such as fares, route information, train timings, online smart card recharge, emergency alerts, etc."

Airport metro in Chennai is currently the highest revenue earner among all the metro stations, which indicates that there is a demand, and CMRL is looking at leveraging upon such indicators, and the support of ICT.

PUBLIC TRANSPORT



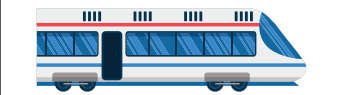
Bus: 4.5 million trips per day



Suburban rail: One million trips per day



MRTS: Around 0.12 million trips per day



Metro: 0.65 million trips per day (after phase one completion).

The article is based on the presentation made at the SmartInfrastructure Symposium 2017, Chennai

Investment in ICT can provide a better quality of life in the cities

CITIES ARE CRUCIAL to nations. They are the center of innovation, cultural and economic growth. With unique identity, cities have huge opportunities for business and employment.



RACHANA JHA
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Migration to urban areas is a big issue

MD Krishnamurthy, Chairman, Karnataka Urban Infrastructure Development & Finance Corporation (KUIDFC), says, that this massive migration from rural to the urban area leads to the population explosion in the cities. "The massive growth and population induced migration from the rural area to urban areas results to the over-congested environment in the cities and causes overall deterioration of the urban

environment in India. Increase in the low-quality migration of poor to urban areas leads to poverty inequality, and insecurity among migrants. Most of the poor are illiterate and lack basic skills. They fail to get jobs in the capital-intensive production system of urban India. These unskilled migrants are absorbed by unorganized sectors which are capitalized by low productivity, tremendous competition, poor pay, and insecurity," says Krishnamurthy. "During the last few decades, there is a rise in housing scarcity and we can see frequent breakdowns in municipal

services such as water supply and other services such as electricity, sewerage, and transport."

Needed a new operating paradigm

Money is the first indispensable when talking about better infrastructure. But, is money the only factor which can solve the problems of migration. Krishnamurthy somehow has a different opinion on this. According to him, throwing more and more money is not a solution to this. The world needs a new operating paradigm that provides a solution that can

sense urban needs, which is economically viable, socially inclusive, and environmentally sustainable. In such cases, technology can play a significant role.

Krishnamurthy says, "Government and businesses are starting to recognize the role of technology in these objectives. ICT can improve connectivity between citizens and government. The investment in ICT can provide a better quality of life. It can enhance service quality and performance. It can be cost-effective and more sustainable. One of the main value propositions of ICT in a smart

city is the ability to capture and share information in a timely manner." The smart city transformation is powered by technology advancements. The deployment of intelligent and information management systems can contribute largely to it.

Important aspects of smart cities

A smart city is one which can ensure easy service delivery and quality life to the people. Some of the important aspects of smart cities are pure safe drinking water, water management, education, health, housing and inclusiveness, transport and mobility, energy supply, energy source, economy and employment, energy efficiency, sanitation, waste management, IT connectivity, intelligent government, safety, quality identity and culture, compactness, open space, and underground electricity wiring.

"Seven cities are proposed to be developed under smart city mission - Belgavi, Davangere, Hubli, Dharwad, Shimoga, Tumkur and Mangalore. Apart from these cities, now Bangalore is also under this mission. The mission covers 100 plus cities and the duration will be five years that may extend

depending on the outcome," Krishnamurthy explains. Each city gets ₹100 crore from the center and the state government for a period of five years – a total of ₹1000 crore for five years. The smart city selection is based on the competition process. It is expected that the large part of the finances for smart cities will have to come from the private sector with the supplementing effort from state and the central government. Centre and state is an equal partner in this development.

Other challenges...

Building new cities and upgrading existing ones is not an easy task. The redevelopment of cities may take a lot of time. Besides there are some other challenges like continuous water supply, reduction in emergency stoppages, billing customers, reduction of water loss, round the clock customer service center, solving complaints under the time frame in the contract, and repair-leaks appearing on the surface within 24 hours. Regarding the challenges, Krishnamurthy says, "Redeveloping the cities may take 2-3 decades. These projects are complex and expensive which creates a problem in kick-starting smart

city projects. Regarding water management, Chief Minister Siddaramaiah has implemented the Karnataka Urban Water Sector Improvement Project. There is a 24/7 water supply under this project. This is a first of its kind in our country. It has been implemented in three cities of Karnataka and has also received an award from the Government of India," he adds.

Smart city is not only about Physical infrastructure

"Does Smart city development depend only on its physical infrastructure? Is proper facility for road, electricity, and water etc, enough to make any city a Smart City?" asks Krishnamurthy. "It also involves other big challenges like creating sustainability, jobs, wise usage of resources training. The idea is to make things working for the masses. "The investment by the government will be the seed money for the projects. And, further investment is expected through a PPP (Public-private partnership) which throws lots of opportunities to the global players," he adds.

The article is based on the presentation made at the Smart Infrastructure Symposium 2017, Chennai

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Ganesh Ramamoorthy,
Managing Vice President, Gartner India

City Operations Centre is about citizen satisfaction, not technology savviness

India, the world's second largest populous country with its unique environmental, demographic and economic constraints, continues to push forward its Smart City mission. Many cities have rolled out numerous projects ranging from city-wide WiFi, smart street lighting, smart transportation to smart parking and smart water and wastewater management. Central to these is the City Operations Centre, aimed at providing a real-time, one-view of the status and condition of the critical components of the city to city planners and decision makers.

A city operations centre is clearly the right thing to do for a city that aspires to transform into a 'smart' one – there is no doubt on that. But it is important to establish the motivation and agree upon the intended purpose and benefits of the city command centre clearly before embarking on this path. Will they be the eyes and ears meant to gather and monitor critical activities of the city? Or will they also be the 'brain' that analyze the city activities in real-time and propose appropriate preventive and prediction actions?

Development of cities in the face of increasing global urbanization is closely linked to the emerging economic, environmental, and demographic opportunities in a society. To exploit these opportunities, cities must align support functions such as maintaining air quality, managing energy and water supply services that citizens demand or the government mandates in such a manner that they cater to the individual citizen needs and create a dynamic service experience for them. But city officials must also balance resources against environmental sustainability concerns and the cost of delivering these support functions.

A smart city initiative is therefore about sustainable outcomes, not merely a technology showcase and is aimed at achieving this delicate balance. Gartner defines a Smart City as "an urbanized area where multiple sectors cooperate to achieve sustainable outcomes through the analysis of contextual real-time information, which is shared among sector-specific information and operational technology (OT) systems." And the city operations centre, or the city command centre, as it is more popularly known as, is the nerve centre that makes this achievable in a smart city.

A city operations centre is the technological manifestation of the alignment of the city administration and stakeholders to the vision and operating governance framework of the smart city (see Figure 1). It is a platform



which delivers operational insights about the city and helps city officials manage, optimize and achieve the city operations' efficiency and quality of citizen life targets/goals.

A city operations center enables smart city officers to integrate data from different sectors and agencies, manage resources, be connected with the citizens and address their concerns, realize transparency and accountability for city operations, and optimize city growth and operations.

An important aspect of the city operations centre is the ability to measure the correlations and study the effects by taking a comprehensive look at the various interconnected factors through dashboards and operate an integrated ecosystems through policy and related initiatives, from an authority and execution perspective.

In the longer term, the platform can help them evaluate operational performance and achievements against targets, with goals for further improvements in the Plan-Do-Check-Act (PDCA) cycle, across city operations.

The closer smart cities get to the operational and management-oriented phase from an infrastructure construction phase, the higher the possibility of improving the quality of citizen life – thanks to better living by, for example, reductions in traffic congestion and CO2 emissions and improvements in bus public transportation services, which are operated

more on time. To do so, it becomes important for the city governments to pursue the two strategic issues of citizen centricity and revitalization of the local economy by

City Operations Centre is aimed at providing a real-time, one-view of the status and condition of the critical components of the city planners and decision makers

improving city operations and management.

Many cities tailor this framework to their specific needs but they largely focus on four key issues while drawing up their smart city strategy:

- To solve current urban issues (Buenos Aires, Kobe, London, New York and Singapore)
- To revitalize the local economy (Barcelona and Malaga in Spain and Ishinomaki and seven cities in the Tohoku region in Japan, which were devastated by the Great East Japan Earthquake in 2011)
- To build the well-advanced cities in "greenfield" sites (Masdar in the UAE)
- To develop new business by selling packaged smart city projects (Yokohama

City and Kashiwa-no-ha in Japan) A well-balanced approach to solving these four key issues depends on how well the city officials establish a holistic city operations management platform (see Figure 2) to help them monitor and analyze the city's conditions in real-time.

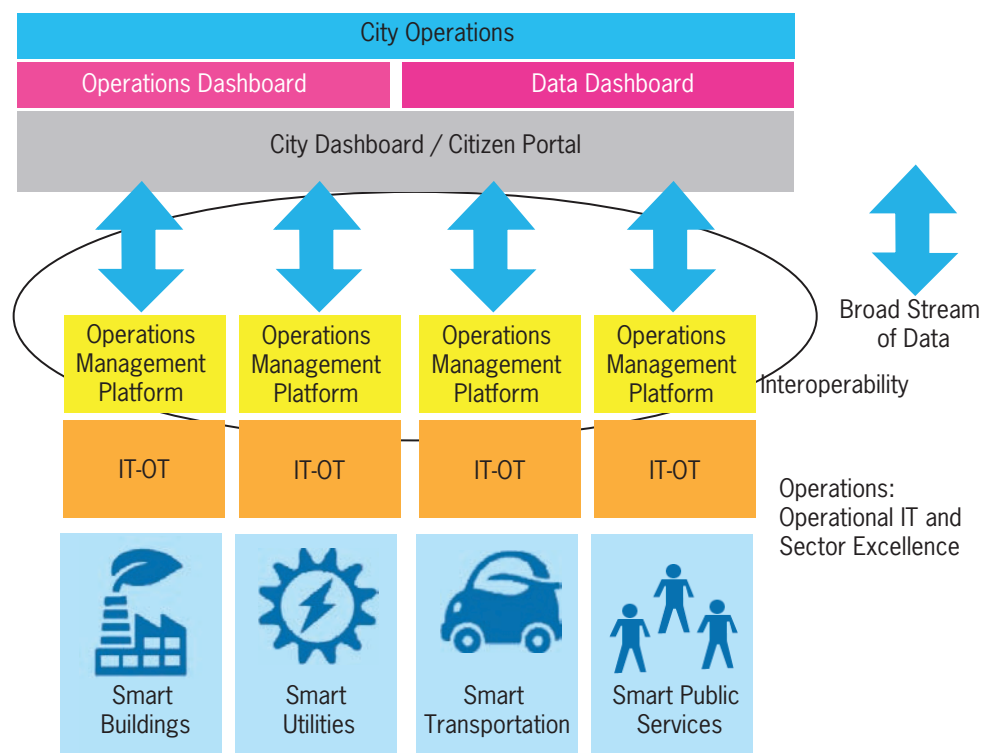
The platform outlines the infrastructure needs with information and data exchange between stakeholders as a fundamental pre-requisite to realize the smart city vision. In short, what this means is that in a smart city, information is shared freely and easily among city departments and citizens, used effectively to advance the city's priorities, and to create and deliver contextualized or demographically aligned service offerings that match the aspirations of the citizens, community and society.

Data and information exchange about city issues and conditions such as traffic congestion, level of air pollution, safety and security conditions, and natural disasters between different sectors and processes is therefore a critical precondition to the success of a city command centre.

The success will further depend on the quality of the business analytics, which in turn depends on the data quality, integrity, as well as its references to citizen (taking into account privacy considerations) and city operations' use cases and applications. Further, use of cloud and big data will challenge the perception of safety in storage and management of data, and hence trust factors need to be conveyed through active communication. The ability of the city operations center to manage and operate all this and provide high-quality information to city officials, will finally determine how well the city officials are able to take decisions to improve the quality of services to the citizens.

With the increasing volume of data and insights, the orchestration of context

FIGURE 2. CITY OPERATIONS MANAGEMENT PLATFORM



Source: Gartner

based on data and insights becomes a critical focus of governance methodologies. Much will hinge on collaboration techniques, data sharing and the algorithmic insights that the context-based services will need to drive citizen-empowered smart cities.

Though this city operations center is still at an early stage in smart city projects and environments, Brazil's Rio de Janeiro has a good example of such a center. Its city operations center was built after a major flood in 2010. Today, managers of Centro de Operacoes Rio (Rio de Janeiro's operations center) monitor data feeds for information on weather, traffic, safety, and healthcare services on a real-time basis in order to provide a better quality of life to its citizens. Rio de Janeiro's city operations center, however, covers more than just emergency response. This city operations center integrates all of the functions in the city in a single digital command-and-control system through many municipals and state departments including private companies.

In India, various cities –

Nagpur, Vizag, Jaipur, Kakinada, Bhubaneswar, Ahmedabad, Pune, Bhopal, Rajkot, and Vadodara – have incorporated numerous smart city infrastructure components of a city operations center. These cities must also develop a business model for city operations to ensure long-term financial viability, based on an ecosystem of strategic business partners – such as the long-term relationships between Telefonica and the Valencia city government and between SAP and the Barcelona city government in Spain.

But a successful city operation centre cannot be measured only on the basis of the ecosystem partners or business model or infrastructure performance such as traffic velocity, revenue per parking vehicle and cost savings through mobile applications. Success must be measured on the basis of the citizens' satisfaction quotient.

It is very critical that city officials ensure that the primary motivation and the intended purpose of the city operations centre is to operate and manage city's

perception of residential and business citizens by linking citizens' personalized contextualized data to metrics for delivering valuable services.

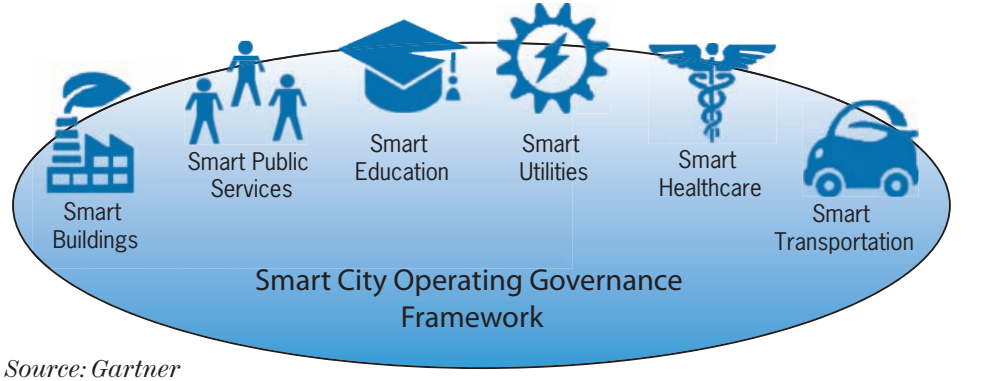
This means that the city officials must focus on developing the right key performance indicators to detect priorities and to measure success and impact, and on developing the right services that are measurable and that which execute on the objectives.

This will allow the city officials to augment the city operations centre with the right technology solutions that are driven by the needs of the city and that are not at the mercy of the vendor capabilities.

Remember: "Smart City" is not a technology initiative, rather, it is a sustainability initiative aimed at addressing the demographic, environmental, and economic aspirations of a growing city through digital technology capabilities.

Authored by **Ganesh Ramamoorthy,** Managing Vice President, Gartner India

FIGURE 1. SMART CITY GOVERNANCE FRAMEWORK



Source: Gartner

Smart Infrastructure Symposium 2017

THE 2ND EDITION of Smart Infrastructure Symposium was held on November 24-25, 2017 at Trident, Chennai. The event was focussed on using smart technologies for smart cities

Brought to you by Express Computer and The Indian Express Group, Smart Infrastructure Symposium, in its second edition, brought together key stakeholders and thought leaders from the country's smart infrastructure ecosystem. Panaji, Chennai, Bengaluru and Guntur, Hyderabad were some of the major smart cities that presented their initiatives at the forum. Some of the prominent speakers include: Dr. Santhosh Babu, IAS, Chairman & MD, Tamil Nadu Handicrafts Development Corporation, ex-IT Secretary, and



MD of ELCOT, Government of Tamil Nadu; J Ashok Kumar, Director - Urban Development Department, Government of Goa; Pankaj Kumar Bansal, MD, Chennai Metro Rail; Shashank Mani Tripathi, IAS, Deputy Commissioner, Corporation of City of Panaji; M D Krishnamurthy, Chairman, Karnataka Urban Infrastructure Development & Finance Corporation. At the symposium, selected smart city projects were also recognised and awarded for innovative use of ICT solutions for running and managing city services.



Accelerating digital innovation for future cities

Kamal Kashyap, Country Manager, Government & Public Sector, Hewlett Packard Enterprise

HPE understands government's concerns on Smart City transformation and is committed to accompanying them in making it a success. HPE's tested horizontal approach can break open vertical projects, transforming them into transverse and interoperable strategies, multiplying the capacity for governance and actions in a flexible, global, and shared architecture, making the company an ideal long-term transformation partner for Smart City leaders.

Smart cities are urban areas that use digital technologies in a secure fashion to manage the municipality's assets, enhance sustainable economic development, reduce costs and resource consumption, and support the well-being of its citizens.

Smart cities have become a global phenomenon, and municipal leaders around the world are interested in the potential opportunities as they prepare their cities for the future. Beyond marketing and technology, an effective smart city strategy takes a city's cultural, socioeconomic, environmental, and geographical realities into account and requires collaboration between stakeholders—from policy makers to citizens—with assistance from trusted,

experienced information and communication technology (ICT) partners.

Every initiative under the Smart City umbrella has an embedded element of technology. City planning, administration, and the related functions require cutting edge technologies like automation, machine learning, Internet of Things (IoT), and artificial intelligence among others. In fact, Smart City initiatives are exploiting these technologies to make services for urban life, richer safer, and far more responsive to citizens' needs.

Digital technologies are creating new opportunities for innovation. Uber or Ola are the perfect examples of an innovation which nobody could have thought about a few years ago. 4G and 5G mobile networks will throw a lot of opportunities for innovation.

Innovation and the proper implementation of new technologies into a Smart City strategy require careful contemplation. ICT partners play a pivotal role in any project's development and implementation, and therefore its ultimate success. Hewlett Packard Enterprise (HPE) helps its customers use technology to slash the time it takes to turn ideas into value.

HPE's value proposition
Kamal Kashyap, Country Manager, Government and Public Sector, HPE India, says, "Today, we are living in a world where everything is connected and everything computes and technology will be embedded everywhere. A



smartphone today has a more powerful CPU than a data centre which used to exist a decade ago. We are witnessing people to people connection, device to device connection, and a mesh of IoT devices that are speaking to each other. With these, everything will be understood. Here, the intelligence comes into the play that allows people to automate a whole lot of basic decision making and helps them in better planning for the future."

He adds, "As part of powerful digital disruptions, we have technologies like IoT, new computing paradigm, cyber security and privacy, and cognitive systems. These are helping us define a lot of

opportunities for us to leverage technology in all the things we do."

However, next generation cities are facing various challenges. These include engagement of citizens in the Smart City process; need of a modern solution to monitor next generation cities; availability of intelligent information that would require precise monitoring; and developing an integrated city management system, which would again require bringing all the elements together be it the traffic management, police surveillance, and transportation system.

"When we talk about Smart City and leveraging

technology, the centre of all these is citizen and improving quality of life in terms of safety, air quality, water, food, green spaces, and culture among other areas. Hence, when we plan the entire roadmap around citizen, then we have to ensure that the core services are very efficient, agile, and have resilience to scale. Similarly, when an integrated command and control centre or those kinds of initiatives are being planned, we have to look at elasticity and scalability of the platform," highlights Kashyap.

IoT as a key technology enabler

Kashyap further states, "HPE is working towards bringing artificial intelligence in network security. When we talk about IoT in the context of Smart City, there are millions of devices like cameras, sensors, bins – all have IoT element embedded into them. IoT has the potential to facilitate beneficial decision-making that no stand-alone device could collect and process on its own. To truly exploit the benefits of IoT within a Smart City, a holistic approach is required such that the infrastructure deployed is flexible enough to support multiple use cases rather than building multiple silos."

As far as IoT is concerned, today government agencies in the country have a number of use cases, which is not just concentrated on the surveillance, parking, or solid waste management space but

also in areas like environment, healthcare, location and context based services. Many cities are now looking to expand the use IoT to improve services like waste management, water management and quality, and energy consumption in public buildings. Additionally, the use of contextual analysis to provide real-time information to citizens and authorities are growing in popularity.

"At HPE, we are doing a lot of work in the healthcare domain as part of our CSR activities. Here, we actually take a shipping container, retrofit it, and make it a primary healthcare centre. Besides the classic telemedicine element, it also has a few medical devices which are IoT enabled. As the primary health worker is taking the data to a doctor sitting remotely in a specialty centre, all the patient related reading is available to the doctor online. This all has been developed by our labs in India and we have 77 of these in the country today and almost five lakh patients have been treated this way. We have tie-ups with various hospitals that provide the expertise," points out Kashyap.

In the domain of location and context based services, HPE has done a pilot project for a large municipal corporation based out of Southern India. Here, when a citizen walks into the corporation office, he has the map of office available on the mobile, wherein he can be guided to the right room, schedule appointments, be

informed, and given feedback. All this is based on the company's Aruba Wi-Fi devices, called Beacon services. These are also being used in some places to track files.

HPE Universal IoT Platform

HPE has capabilities and experience to support these use cases and more through a combination of the HPE Universal IoT Platform and other products and services. With HPE Universal IoT platform, the company delivers end-to-end functionalities and creates the technical and economic conditions for offering energy management applications to consumers, industries, and cities on a single cost-effective, standard-compliant, scalable, and vendor-agnostic multi-tenant platform. This is achieved by federating and streamlining different smart environments with multiple gateways and protocols, energy-related sensors, and applications.

"Critical for a Smart City where the range of connected objects and connectivity options is large and diverse, HPE Universal IoT Platform enables the connection and exchange of information between heterogeneous IoT devices (standard and proprietary communication) and applications. It also dramatically simplifies the integration of diverse devices with different communication protocols by transforming the ingested data into the one M2M data model," concludes Kashyap.

VA Tech Wabag hails water desalination for smart cities



Swadhin Samantary, Head - Global Capital Projects, VA Tech Wabag Ltd

Swadhin Samantary, Head - Global Capital Projects at VA Tech Wabag Ltd, urged state governments and municipalities to implement desalination projects for ensuring water management efficiencies in smart cities.

Recognised among the key sectors in smart cities, water and waste water management is a crucial area that needs diligent attention. A major player in the water treatment

field, VA Tech Wabag is encouraging efficient water resource management through desalination plants, wherein the process starts with the collection of intake water from the river, which is sent to the treatment plant for purification, then used in three different applications – agriculture, domestic and industrial.

Samantary said, "The Indian government has announced many innovative plans such as the Smart Cities, Namami Gange Programme and Swachh Bharat, of which the desired policy framework

has already been put in place. Many of the smart cities such as Pune, Vizag and Solapur have already started implementing projects for water and waste water management."

The majority of utilisation (70 per cent) is done for agricultural purpose, followed by industrial and domestic. After use, the water is collected and transmitted to the treatment plant and, after meeting the discharge guidelines, let out into the river.

Samantary added that the company's focus in smart cities is desalination in coastal areas, pointing out that Gujarat, Andhra Pradesh, Tamil Nadu and Maharashtra experience huge water scarcity, but possess long coastlines, which can be utilised for desalination projects.

Having presence in 30 countries, with three R&D facilities, VA Tech Wabag has executed over 6,000 projects globally.

"The mindset regarding

desalinated water has to change; it is not an expensive solution. There are many ways to go ahead with desalinated water such as cross-subsidising, charging higher tariffs to industries and subsidise it for the public. We have proposed this idea to various states with coastal regions, wherein we have proposed a PPP model for implementation. We have also been receiving numerous enquiries from different municipalities," Samantary commented.

According to him, of the 62,000 million litres per day (MLD) of sewage generated in India, only 23,277 MLD is being treated. "Around 13 percent of the existing plants are non-operational, which are not compliant with the latest guidelines, so we have been interacting with the stakeholders to upgrade the plants," he said.

VA Tech Wabag's upcoming projects are expected to be in the state of Maharashtra (Marathwada) and Chandigarh.

Chennai Metro Rail banks upon smart solutions to drive public transport growth

L Narasim Prasad, Director, Systems, Operations, CMRL

With only 63 per cent of Chennai's roads being two-lane roads, coupled with 40 per cent of the city's population commuting by personalized vehicles (including and two-wheelers and cars), public transport system needs to be highlighted. While Chennai's bus network – having 834 routes and a fleet of 3,843 buses – carries the major chunk of commuters across the public transport system, Chennai Metro Rail Ltd (CMRL) is looking at transforming the city's transportation habits through effective adoption of information and communications technology. Sharing thoughts on the same, L Narasim Prasad, Director, Systems and Operations, CMRL, says, "People talk about cars, for instance 50 per cent of the



people in Goa have cars, but the true sense comes in the meaning of a developed country. A developed country is not where the poor have cars, but where the rich travel in public transport. In this endeavour, the Chennai Metro Rail is pushing ahead to get the middle class and upper middle class people also use public transport. For this, we need to be smart, otherwise we will be left behind."

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How safety and sustainability form the crux of smart cities

The basics of planning and implementation play a crucial role in developing smart cities, lying at the helm of government authorities and private stakeholders. The government's ambitious Smart Cities vision has been carefully worked upon in order to ensure planning and implementation efficiency, thereby creating sustainable cities across diverse aspects. The second edition of Smart Infrastructure Symposium held in Chennai, shed light on two of the most vital topics in building safe and sustainable cities. Moderated



[L-R] Moderator: Arun Moral J, Director - Government & Public Sector Consulting, PwC; S A V, Prasada Rao, Joint Transport Commissioner, Road Safety, Andhra Pradesh Road Transport; J Raj Kennedy, Additional Commissioner, Greater Hyderabad Municipal Corporation; Dr. Santhosh Babu, IAS, Chairman & MD, Tamil Nadu Handicrafts Development Corporation, Ex-IT Secretary, and MD of ELCOT, Government of Tamil Nadu; Kamal Kashyap, Country Manager, Government & Public Sector, Hewlett Packard Enterprise; Rajneesh Chopra, Global Head - Business Development, VA Tech WABAG

by Arun Moral J, Director – Government and Public Sector Consulting, PwC, the panel discussion witnessed public sector officials and private sector partners chart out a roadmap for Smart Cities of the future. The panel included S A V, Prasada Rao, Joint Transport Commissioner, Road Safety, Andhra Pradesh Road Transport; Dr Santhosh Babu, IAS, Chairman and MD, Tamil Nadu Handicrafts Development Corporation; J Raj Kennedy, Additional Commissioner, Greater Hyderabad Municipal Corporation; Kamal Kashyap, Country Manager,

Government and Public Sector, Hewlett Packard Enterprise; and Rajneesh Chopra, Global Head, VA Tech Wabag.

Sharing his thoughts on the present road traffic scenario in Hyderabad and the efforts to address the challenges, Kennedy says, "Our city is growing very irregularly, there are no planned roads, and the sewer system is narrow. Traffic is a big problem for us like any other metro city, so we need to control the traffic through signalling systems and we are now planning to go for a free-flow of traffic, we are going for strategic road

development plan, thereby reducing pollution and travel time. Another thing we are doing is junction improvement, alongside widening of roads and constructing flyovers."

One of the important functions of the command and control centre is to improve operational efficiency, but planning is also a crucial aspect. Kashyap comments, "Now we have the ability to foresee future developments and plan accordingly well in advance. Singapore, which has one of the best traffic management systems, is already planning for enhancement due to the city's foreseeable situations."

Chennai: A global smart city in the making

Arun Moral J, Director - Government & Public Sector Consulting, PwC

The second day of Smart Infrastructure Symposium (SIS) 2017 kick-started on a high note with a detailed presentation by Arun Moral J, Director – Government and Public Sector Consulting, PricewaterhouseCoopers (PwC). He showcased various nuggets that went behind the smart city project in Chennai. He discussed global best practices and solutions being implemented and how did they address some of the most pressing challenges and integrate in the security and fire domain. He provided high-impact informative demos and a wealth of opportunities for the audience to network and learn about cutting-edge technologies, industry trends, challenges, market insights and discover the best solutions for the making of a smart city during his session.

"Following the depletion of natural resources as result of



cyclone, the city is plagued by a host of concerns. This calls for deployment of smart and sustainable solutions," says Moral in his presentation.

He dwells on the proposal stage to domain identification of the project in a length. "The proposal would be defined primarily based on the voice of Chennai's residents. An extensive citizen engagement programme was established by Corporation of Chennai to document the views and concerns for the same. We used social media platforms for the residents for their opinion and ideas on civic services such as transport, parking, water

supply, sanitation, energy, housing, IT solutions, health, education, safety and security," he explains.

Key challenges, learnings and best practices behind Chennai, Bangalore mega metro projects

Leading B2B enterprise publication, Express Computer recently concluded the second edition of Smart Infrastructure Symposium held in Chennai on November 25, 2017. The two day conference witnessed key stakeholders and thought leaders from the smart infrastructure ecosystem, discuss and deliberate on best practices and critical elements that governments and government organisations must focus on to achieve the smart infrastructure vision.

The panel 2 of the second day of the conference highlighted the key learnings from India's transformative infrastructure projects like Chennai, Bangalore metro rail projects and digitisation of

transport department. The session was moderated by Srikanth RP, Editor, Express Computer. The panelists were L Narasim Prasad, Director (Systems & Operations), Chennai Metro Rail Ltd; LSM Ramasree, Joint Transport Commissioner-IT & Admin, Andhra Pradesh State Road Transport; Cylesh GS, DGM IT, Bangalore Metro Rail Corporation and Vikas Hooda, Future Cities Lead, HP Enterprise.

The panelists of the session shared their organisations' experiences while implementing the projects. They voiced their learnings and best practices. Cylesh GS opened the session and spoke about how IT was used, right from drawing room to implementation stage in the making of Bangalore metro project - starting from the collection of sample data for the fixing of the alignment of each and every corridor and using technologies like transport model to 3D animation and Google Map, etc.

Investment in ICT can provide a better quality of life in the cities



M D Krishnamurthy, Chairman, Karnataka Urban Infrastructure Development & Finance Corporation

M D Krishnamurthy, Chairman, Karnataka Urban Infrastructure Development & Finance Corporation (KUIDFC), says, that this massive migration from rural to the urban area leads to the

population explosion in the cities. "The massive growth and population induced migration from the rural area to urban areas results to the over-congested environment in the cities and causes overall deterioration of the urban environment in India. Increase in the low-quality migration of poor to urban areas leads to poverty inequality, and insecurity among migrants. Most of the poor are illiterate and lack basic skills. They fail to get jobs in the capital-intensive production system of urban India. These unskilled migrants are absorbed by unorganised sectors which are capitalised by low productivity, tremendous competition, poor pay, and insecurity," says Krishnamurthy adding, "During the last few decades, there is a rise in housing scarcity and we can see frequent breakdowns in municipal services such as

water supply and other services such as electricity, sewerage, and transport."

Needed a new operating paradigm

When we talk of better infrastructure, the first thing that comes to our mind is money. We somewhere believe that investing a huge amount of money can bring a better infrastructure and help in making a city a smart city. But, is money the only factor which can solve the problems caused by the migration from the rural to urban areas. Krishnamurthy somehow has a different opinion on this. According to him, throwing more and more money is not a solution to this. The world needs a new operating paradigm that provides a solution that can sense urban needs, which is economically viable, socially inclusive, and environmentally sustainable. In such cases, technology can play a significant role.

BMTC: The experience with Big Data



Nagendra N, Chief Systems Manager, BMTC

BMTC produces one billion rows of data each month; Since implementing the ITS in June 2016, IM Bangalore has amassed 15 billion rows. The public transporter has partnered with IM Bangalore for managing the data generated to devise ways to coin better services for the

passengers and enhance revenue

A Central Control Centre (CCC), has been established for the ITS at the BMTC central office in Shantinagar, Bengaluru. It is a 20 seater centre monitoring 6500 buses. The ITS is one of the projects in India to have the largest impact to citizens, as BMTC has a ridership of approximately 5.2 million per day (Bengaluru has a population of around 10

million). The scale of deployment is also one of the largest in India, with over 10000 online Electronic Ticketing Machines (ETMs) and over 6500 Vehicle Tracking Units (VTUs) "The monitoring helps us to catch bus route skipping and deviations. This information is then passed on to the concerned authorities," says Nagendra N, Chief Systems Manager, BMTC. The bus, before leaving the depot, is mapped to the ITS using a GPS. Every ten seconds, the data is relayed to the central server. The bus is tracked for the scheduled route it is supposed to take. The commuters standing at the bus stop can check the status of the bus on the mobile app; Public Information Display (PID) on the bus stands. The communication device is also provided for both the driver and the control room to contact each other.

Chennai all set to embrace smart city projects

L Nandakumar, Superintending Engineer, Smart City, Special Projects, Greater Chennai Corporation

Chennai, the capital of Tamil Nadu and the fourth largest city in India, is one of the biggest cultural, economic and educational centres in south India. With the change of time, the city has also witnessed a lot of socio-cultural development and now it is in the race of becoming one of the leading cities to lead the initiatives in smart infrastructure related projects.

Major initiatives taken

By securing its place in the smart city list, Chennai needs to fulfill all the relevant smart city project criteria. Out of the many criteria, road, water and drain management is among of the most important, especially in Chennai which was a spectator of a historic flood.

This disastrous flood created a dire need for better road and drain management in the city. Efficient road network contributes to the development of a city; and the Greater Chennai Corporation is taking relevant measures for the development of the city's roads.

According to L Nandakumar, Superintendent Engineer, Storm Water Drains and Road Projects, Greater Chennai Corporation, some new projects have been already implemented and some are in the pipeline to enhance the condition of the city's roads and drains. "For the first time, in view of the traffic density, consultants have been appointed for designing the roads by studying existing road surface and strength, using Benkelman Beam Deflection (BBM) and Axle test; and works were executed by preparing estimation on the basis. Besides, for the first time, all the roads have been



built to prevent the increase of road height. They have been milled using sophisticated milling machines, so as to ensure that the height of the road does not increase and the road would become smooth. We have milled all 471 roads. This was mandated by the Supreme Court and we are the first city to comply this. We made essential for contractors to buy this machine, so that we can check all the roads. We have it compulsory for them to buy at the time of tender," he says.

Also, it was mandated to

engage 9m automated sensor road laying paver for increasing compactness, smoothness and to give better smooth riding surface. Earlier only 6m pavers were used. The roads have been laid with 50mm camber layer, 50mm strengthening layer and 40 mm finishing layer, so that the road was laid to a thickness of 140mm. Within half an hour of rain, the roads will be all visible.

"The road should be very clear for people to have mobility. After the 2015 floods, we ensured that this won't happen again. Apart from this, the roadworks camber correction has been done for all the roads to prevent water stagnation at the centre of the roads and to ensure the flow of water immediately to the edges of the roads. Also, this is the first time, a project management consultancy has been brought to a local body," adds Nandakumar.

Learnings from Chennai, Bangalore mega metro projects

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The panelists of the session shared their organisations' experiences while implementing the projects. They shared their learnings and best practices. Cylesh GS opened the session and spoke about how IT was used, end-



[L-R] L Narasim Prasad, Director - System & Operations, Chennai Metro Rail, LSM Ramasree, Joint Transport Commissioner, AP State Road Transport, Cylesh G S, DGM - IT, Bangalore Metro Rail Corporation, Vikas Hooda, Future Cities Lead, Hewlett Packard Enterprise

toend - From drawing room to implementation stage in the making of Bangalore metro project - starting from the collection of sample data for the fixing of the alignment of every corridor and using technologies like transport model to 3D animation and Google Map, etc.

Explaining the challenges encountered, Cylesh said, "The

biggest challenge was, how to keep our milestones and reports simple so that it can be easily analysed and interpreted across the people involved in the project. We used software like Primavera and Excel sheets for the same. In the last leg of completion, we used SMS services for charging the smart cards, later we moved to app driven platform.

Yet another important phase of the project was using of optical fibre at the stations. We put lots of fibre in all the stations from the capacity building point of view and lease out the fiber to telcos. With the available optical fibre, we could connect the data centers across Bangalore with 100% uptime. Likewise, lots of IT initiatives being driven down in

Bangalore metro project."

Ramasree from Andhra Pradesh State Road Transport, showed concern on the lack of IT budgets and why large private IT companies are shying away from working with the government departments due to the late payment issues and internal bottlenecks faced by the department. She also highlighted the anomalies in the systems and how despite the lack of funds, skill sets and manpower, the transport department, is among the fourth highest revenue earning department in Andhra Pradesh. Sharing some of the best practices, she emphasized on the need of dedicated IT wing for the sustainability of the IT project. She advised to start with a pilot project before rolling it on a large scale to understand the teething problems and take corrective measures for simplifying the

citizen services for the betterment of the project.

L Narasim of Chennai Metro Rail project and one of the veterans in Indian Railways highlighted how the Chennai metro rail is different in its approach and execution of project vis-a-vis its big brothers like Delhi, Bangalore metro projects and Indian Railways. He narrated with examples how the decision of outsourcing some part of the project to the third party IT players has brought major efficiency and productivity into the implementation of project. "The idea was to invite private players for the execution of the project so that we can tap their efficiency for the first time in a public sector environment. Today, from technical maintenance to rolling stock, signalling and train operation including train drivers training, etc, we have

outsourced to the third parties. It was never experimented before in Indian Railways and metros. We are trying to do things differently with limited budgets and manpower. The other big focus is using green technologies."

Disagreeing with the Narasim, both Cylesh and Ramasree voiced their belief in empowering the team within the departments and enhancing skill sets than working with third party players.

Vikas Hooda suggested how technologies can leapfrog the discussed challenges in a much better way. He gave insights into how the use of cutting edge technologies like analytics and IoT have provided the differentiation factor for segments like healthcare, power and infrastructure. He also shared some of the global learnings which HP has showcased in the smart cities project.

Smart Infrastructure Innovation Awards



Chennai Metro Rail



Guntur Municipal Corporation



Bangalore Metropolitan Transport Corporation



Tiruchirappalli City Corporation



Andhra Pradesh Power Generation Corporation



Andhra Pradesh State Road Transport



Greater Chennai Corporation



Surat Municipal Corporation



Greater Visakhapatnam Municipal Corporation



Vijayawada Municipal Corporation



Kerala State Electricity Board



Smart Infrastructure Innovation Award Winners- 2017

We want to make India the Global Hub for cybersecurity

DATA SECURITY Council of India (DSCI), is a not-for-profit, industry body on data protection in India, set up by NASSCOM. It is committed to make India's cyberspace safe, secure and trusted by establishing best practices, standards and taking new initiatives in cybersecurity and privacy. In an interview to Express Computer's Sandhya Michu, **Rama Vedashree**, CEO, DSCI, provides detailed insights about the new initiatives undertaken by DSCI in the wake of growing cyber attacks, the upcoming Data Protection Law, and capacity building for cybersecurity. Some edited excerpts follow:

Tell us about the recent initiatives undertaken by DSCI in the current year?

As an industry body, we engage with diverse stakeholders, for activities that spin off from our core strategic objectives. In the current year, we have taken several initiatives to grow the cybersecurity market in and from India. One of them is cybersecurity industry development. Growing the industry to the vision which we have setup for making it US\$ 35 billion by 2025. We have been working on developing the start-up ecosystem, including how do we enable market access both in India and globally, their customer and investor connect programmes. That is one big area that we have been focused on. We also want to make India the destination for cyber security whether it's for product R&D or for global in-house centres.

Secondly, we started working with user organisations, not just the banking sector, but the critical infrastructure organisations and their nodal agencies like National Critical Information Infrastructure Protection Centre (NCIIPC) and CERT-in to ensure, the preparedness for cybersecurity threats is well planned. We have been working with sectors like banking, telecom, insurance, critical infrastructure (Oil and Gas companies). Of course the third area of focus for last many years has been Data protection and privacy such as privacy certification and readiness of the industry for EU General Data Protection Regulation (EU GDPR). DSCI has worked extensively around EU GDPR and its implications not only for tech industry but also for Banks in India who operate in EU. EU GDPR and its implications for IT industry

has been a key focus area in the last one year.

The latest in the current scheme of work is the recent announcement of Data Protection Committee, constituted by Government of India. It is anchored by MeitY and DSCI is one of the members of the committee. We have participated in the committee deliberations and presented the industry perspectives on cross border data flow, localisation, India's growing analytics industry and innovation on data, best practices of various global data protection regimes, and the need to take cognizance of a digital economy and balancing data protection regulations with industry growth and innovation. Additionally, DSCI was a part of two sub-committees constituted by RBI, on mobile banking security and cards payments security. DSCI has contributed largely to these deliberations and reports, which have been finalised by RBI and we understand these reports will be submitted to the standing committee of cybersecurity and other stakeholders. Then there are many focus areas on use cases of Artificial Intelligence, Blockchain, Machine Learning and Internet of Things in cybersecurity. We have built communities around these technologies. The next big project we have taken up is digital payments security awareness campaign. DSCI along with MeitY, NABARD, State Governments will be rolling out for end users and merchants. Overall digital payments adoption drive is being done by banks and government. Security of digital payments is very important to build trust among the end users so that in the long run it will make digital payments more sustainable.

We have built this campaign in four Indian languages; the

campaign is conceptualised and designed by DSCI and Google in association with MeitY along with other financial institutes who will be raising awareness through their channel of communications. In lines of digital payments security, we are working on digital payments security alliance where we will bring various digital payments providers be it technology companies, platform providers, and financial institutes to come together to deliberate on the policy imperatives for digital payments security.

As digital payments are becoming a driving force behind the digital economy, what are some of the initiatives taken by DSCI to make this space more secure?

RBI, MeitY are focused on security framework for digital payments. DSCI is engaged with industry members in studying global best practices and LEA capability building for consumer grievances handling. Industry players like PayPal, Paytm are associated with DSCI in some of these initiatives to drive digital payments security. We hope the formation of the digital payments security alliance will deliberate and come up with whitepapers and policy recommendations.

What efforts is DSCI taking to build knowledge and capacity building around new emerging technologies like Blockchain, IoT, AI and Machine Learning?

This year the Government of India and DSCI have undertaken to build a National Technology Repository for cybersecurity. As part of the project, we will discover and showcase all the competencies across the country in 25 technology areas. In the first phase, we are looking at five



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areas: Forensics, AI, Blockchain, IoT and Cryptology. We are studying the entire landscape as the competency may reside in freelancers, startups, large services firms, global in-house centers or it can reside in academic labs. Presently, we are studying and capturing insights from academia, industry members, and user organisations. As part of the platform, at a country level, we will have a dashboard view of competencies in certain

technologies and will be opened to public. This repository will help government and industry. It can give insights to the government on current capabilities and domains to invest in future for both academic, research and industry development including startups. We are building this repository leveraging machine learning and automation to ensure it stays current and updated. The first phase will be rolled out in the next two-three months.

In line with the Prime Minister's vision to make India a hub of cybersecurity products and services, NASSCOM-DSCI Cybersecurity Task Force (CSTF) had launched the roadmap for building the cybersecurity products and services industry to US\$ 35 billion by 2025. How are you currently working with the industry and the government to meet this ambitious target?

Promoting Indian cybersecurity innovation and entrepreneurship is one of the imperatives to build robust capabilities and strengthening cybersecurity posture of the country. Though Indian cybersecurity industry is at a nascent stage, we have seen some success stories of our entrepreneurs winning in global markets. As cybersecurity startups continue to face challenges in market access, it is important that the government and investors come forward to support them at different stages of their lifecycle. We started this in 2016. So far, we believe as of last year we were at US\$ 4.5 billion revenue in cybersecurity in India. We have about 100 plus product startup companies and the workforce in the cybersecurity domain is around 1.70 lakh. With industry collaboration and government support, we believe this growth charter will be met.

What key opportunities do you envisage for the cybersecurity industry?

In terms of present opportunities for cybersecurity, we are quite upbeat. In India, there is enough focus now from the government and regulators side. Some sectors have taken the lead. For example, the banking sector had come up with a cybersecurity

framework last year, which was followed by the insurance sector. NCIIPC came up with the guidelines for critical infrastructure sector companies. I think the attention for cybersecurity in large enterprises at a board level is happening now. Previously security used to be looked at as compliance, but now security is getting limelight as both governments and businesses are going through a digital transformation. Breach notifications are gaining maturity and mandatory breach disclosure. Appointment of a CISO and risk officers are no longer options. MeitY is asking every government department to appoint a CISO. Recently, there was an advisory from MeitY to reserve 10 per cent of every IT project budget for cybersecurity. The National Cybersecurity Coordinator Office and the Urban Development Ministry have issued a cybersecurity framework for 100 smart cities mission.

The Modi government recently appointed an expert committee, headed by former Supreme Court judge B N Srikrishna, to "study various data protection issues" in India and recommend a Draft Data protection law. What role is DSCI going to play. Can you throw some light on the same?

In the next few months, we will be working with the Data Protection Committee. We will advocate industry perspectives for a data protection regime to support the growing digital economy. Issues like cross border data flow, privacy by design principles, privacy breach notifications and capability building will also be looked at.

We want to promote a healthy cyber regime for diplomacy

THE MINISTRY OF EXTERNAL AFFAIRS put forth the cyber for diplomacy topic in the recently held Global Conference on Cyberspace (GCCS). The Ministry of External Affairs (MEA) feels that there is an emergence of focused conferences on cybersecurity which will help in facilitating more collaboration in this area. In a conversation with EC's Sandhya Michu, **Sanjay Kumar Verma**, Additional Secretary, Administration, MEA, shares his view on how the MEA is taking steps to secure its systems. Some edited excerpts:



As more and more cyber attacks are launched from cross borders, what steps is the MEA taking to secure its systems?

We are largely responsible for securing our own IT assets. As far as other ministries are concerned, every ministry has

dedicated CISOs for securing its infrastructure. The MEA works very closely with the National Cyber Security Coordinator, while coordinating with our international partners. We have been building intra-MEA applications to communicate with our stakeholders across geographies and time zones. The other focus area is improving the interface of e-services like visa, passport, etc. We are monitoring over 200 websites on a regular basis and managing them as per the new tech requirements, as sometimes changes made may bring vulnerabilities into the systems.

But, we have not seen any obvious breach of security on any of these web pages. MEA services will always remain the target by those countries, which need to get information or data out of our sites. Every single day, there will be multiple attacks launched on our sites, but we have not seen any major breach of security.

How is the MEA leveraging technology to strengthen its cybersecurity posture?

We have been improving the connectivity and looking for scalable technologies. In the case of other government ministries, they have to protect the data within India, whereas our data may ride on the hostile



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network and we have to secure our data without compromising the national security.

How is the MEA tackling the issue of cyber diplomacy?

Within MEA, we have a cyber diplomacy division to tackle such issues. We have been working and developing distinct cyber diplomacy

policies as they attempt to mitigate threats and promote healthy cyber behaviour. Still, attacks are worsening, exposing sensitive data and coercing governments, agencies and private enterprises of all sizes. MEA has been participating in bilateral forums for discussing cyber for

diplomacy. The recent held Global Conference on Cyberspace (GCCS), an annual gathering of delegates and representatives, was held in Delhi to discuss better ways to protect networks, shore up data and repel attacks. There is an emergence of focused conferences on cyber security has created a sort of inroad for more collaboration. These conferences aimed to increase cybersecurity awareness and promote best practices across the geopolitical spectrum. As the scope of these attacks is getting vast, it requires a certain co-dependence between nations, and awareness at the enterprise level.

What are the key priorities of the MEA for the next year?

From a cybersecurity point of view, it has got two major components: one is the user aspect and another is technology. For user aspects, we keep holding sessions and keep training people for raising their awareness. Unless we inculcate a cyber hygiene amongst the users of these programmes and software, it will be difficult to take it forward. I would say about 50 per cent of cybersecurity is user awareness and the rest is covered by technology. We look forward to evaluate new technologies to build new solutions for our systems.

Security is an integral part of the overall GSTN design

APART FROM THE business objective, security and privacy of tax payers data is of utmost importance to GSTN. Hence, security is an integral part of the overall GSTN design," says **Anand Pande**, Senior Vice President (CISO), GSTN in an interview with EC's Mohd Ujaley

What are the unique features of the GSTN system?

The whole GSTN is based on few key principles. Apart from the business objective, the security and privacy of tax payers' data is of utmost importance. Security is an integral part of the overall GSTN design, as the GSTN system is handling critical data of the tax payers. We are providing a platform to the stakeholders to interact with the system and perform tax related activities. The IT backbone is based on open API architecture and Ministry of Electronics and Information Technology guidelines.

The core GSTN system ensures vendor neutrality. This means that it has been designed on open source platform to make it scalable, available and reliable. One of the key differentiators of the GSTN IT backbone is reconstruction of the truth. At a given point of time, for any data that a tax payer is submitting, we will be able to generate the same data with the same details at any given point of time.

How has information security been embedded in the GSTN system?

On the security front, we perceived that cyber attacks are a key threat. There is also a risk from insider threats and external threats. So, to mitigate these threats, some risk mitigating principles and controls have been designed and implemented in the system. For example, core GSTN system is not exposed to the internet directly. Any interaction with the GSTN system – to and from – happens through an API and information in between is fully encrypted.

The overall system is a layered architecture. Right from the perimeter to the



core, multiple tools and technologies are deployed to ensure security, not only of the data but the overall system as well. Any access to GSTN system is a roll based access because the GSTN application will be used not only by the tax payers but also by the tax officials, state governments and their different organisations. The overall access to anything is roll-based access on a need to know basis. For example, if I am from a particular zone in Maharashtra, I will only have access to tax payer data from that zone, not of other zones, which ensures security and privacy of data. In addition to make the security robust, we have real time monitoring of any information that is going

out and coming into the entire GSTN ecosystem. And, the system itself is subjected to multiple reviews and periodic audits.

GSTN ecosystem is based on open source architecture? How do you ensure security of the systems itself?

GSTN ecosystem is based on open source architecture. Therefore, it is important that any tools and technology that we use for software development should not pose any threat or risk to the system. So, all the packages, which are selected go for checking for security malware, compliance and risk among others.

After doing this, we have

created a repository of software. Only from that repository, tools are utilised. It is not that any tool that can be downloaded from the internet can be utilised. It means, we have control even on the selection of the tools and periodically, we keep on reviewing the repository.

On the application front, the entire development happens in alignment with the secure Software Development Life Cycle (SDLC). Our partners are CMMI certified, which means that we follow all the best practices which are available for software development.

Data centres are a critical part of any IT architecture. At GSTN, how are data

centres, managed and secured?

The entire GST application is hosted out of two main data centres, which are supported by two more data centres located near to them. They function as disaster recovery centres. One of the centres is in Delhi and the other is in Bengaluru. The overall architecture of the data centre is designed for no data loss. In a typical arrangement, there will be one data center and a disaster recovery (DR) centre at some different place. We do not have a separate DR. Our both data centres are functionally active. So, if any data centre goes down, we will have at least three copies available of that data just to ensure zero



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are secured based on industry standards and government guidelines.

What standards do you follow at GSTN?

The entire GSTN center is certified against three standards – ISO 27001 which is for physical security, ISO 20001 for IT service and ISO 22301, which is for business continuity. So these three certifications have to be there from the day we go live on any services. Internally, also the entire network is segmented into various zones via VLANs and the resiliency is there at the device and link level. It has been designed to provide continuous availability.

Apart from traditional firewall, we have deployed a plethora of security tools and next gen devices. We have separate sand boxing tools, Anti-APT, anti-malware and intrusion prevention systems in place. On the Internet side, solutions have been deployed for DDoS protection. This is in addition to the protection that we are getting from ISPs. Even for database security, apart from roll based access, the entire database is structured in such a way that at any given point of time, even if the system gets compromised, the hacker will not get access to the entire data and whatever data they get, it will be in an encrypted format, with no use to them.

For example, if you have a particular database which you are storing at various locations, only the system knows that which data is where and how to reconstruct the data in a meaningful way. This is what we do to ensure data security. In addition to real time monitoring, we have deployed DAM tool which is a database activity monitoring tool. So, the overall security is extremely robust.

India needs to enhance the cyber resilience of Digital economy

WITH THE GOVERNMENT putting a sharp focus on digitisation and a cashless economy, "digitisation of everything" and a top class digital infrastructure is a top priority. With an ever increasing digital landscape, India needs to be on guard to enhance its cyber resilience, explains **Dr Gulshan Rai**, National Cyber Security Coordinator, Govt of India, in an interview with EC's Sandhya Michu. Some edited excerpts:



How do you perceive the current cyber threat landscape?

India is witnessing huge digital transformation. As the contribution of digital to the overall GDP grows, there is a need for a highly sustainable cyber security framework.

This is important as the cyber threat landscape is becoming ever more complex and destructive. Over the last few months, attacks targeting governments and enterprises have increased significantly in both number and range with measurable impact on reputation, revenue, operations and customers. Last year, India witnessed a number of cyber breaches, malicious ransomware and economic espionage.

Your suggestions on helping India counter cyber crime effectively?

I would urge all the parties affected by cyber threats, especially security software makers, to work closely with the government in identifying malicious systems to build

resilience. Every stakeholder needs to have shared responsibilities and vision to have a transparency centre at the national level.

Every company in a cyber security domain has set up transparency centres that might help them and their client, but not for society or the nation at large. We need a consolidated transparent center at the national level where all the things can be looked at together simultaneously lawfully.

While the Digital India initiative will increase the relevance of the Internet, it will also expose the country to large cyber-attacks. Hence, we need to make more investments in the area of Artificial Intelligence and Machine Learning.



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How do you think emerging technologies like machine learning and AI will help in bolstering security?

Today, large organisations have installed sophisticated security solutions to protect their data from any cyber attacks, are finding it challenging to defend against targeted attacks. Hence, we

have to focus on process and skills to make our companies more cyber resilience, efficient and productive.

Following the cyber security processes and right skills, will help enterprises in improving the resilience of their digital systems. Machine learning and AI is a double-edged technology, which will help in

identifying background processes, but at the same time, also provides hackers with information to breach systems. If we follow processes and properly interpret the results of AI or machine learning, we would be able to enhance the resilience of our digital systems and minimise impact of many cyber attacks. There is a need for security companies to work closely with government organisations like the Indian Computer Emergency Response Team and National Critical Information Infrastructure Protection Center to secure the digital ecosystem.

What are some of the top initiatives taken by the

Government for making digital transactions more secure?

The government is seriously implementing the security policy with the help of the Reserve Bank of India and SEBI. Currently, the RBI is focused on regulations and compliance. Among all the financial installations, the part which is governed by SEBI is more risky. In case of RBI, the money travels from one bank to another one. Each transaction is closely monitored. In case of non financial institutions like stock exchange, the tracking of risk parameters are much higher. Having said so, the government is taking various steps to bring every digital transaction under the gamut of our cyber policy.

Express Digital Governance Series, Raipur focuses on tech for effective governance

EXPRESS DIGITAL GOVERNANCE SERIES, organised by Express Computer and Microsoft India focused on the use of technology for effective governance in Chhattisgarh



With strong leadership and many successful e-governance projects, Chhattisgarh aims to take the intervention of technology in governance to the next level. While sharing his views about government works in the area of technology, A P Tripathi, Special Secretary, Commercial Tax Department, Government of Chhattisgarh, said, "There

has been gradual improvement in the use of technology in the state. Even in commercial tax department, we have been able to manage initial hiccups in relation to GST due to the availability of right technology driven solutions."

With the focus on the digital transformation of the government departments in Chhattisgarh, Indian Express Group's Express Computer magazine, in partnership with

technology giant Microsoft, organised a conference titled 'Express Digital Governance Series' in Raipur. Senior officials from different departments, experts, and IT heads of state corporations came together to discuss and deliberate upon digital transformation that the state can undertake to bring efficiency, transparency and good governance.

The conference kicked-off

with a welcome address by Mohd Ujaley, Principal Correspondent, Express Computer. While delivering his introductory speech, Raghuvesh Sarup, CMO, Microsoft India said that the significance of technology intervention in government is well known. States after states are adopting modern technology to improve their efficiency. He said that projects like Aadhaar have shown how

integration of technology with good collaboration between government agencies and private firms can improve the delivery of government to citizen services.

After the keynote address, Bhaskar Basu – Director, Product Marketing, Microsoft India, spoke about the importance of collaborations for government department. In his presentation on enabling productivity in the

mobile-first world, Basu presented a detailed overview of Microsoft Kaizala. This product is being used by some of the states in India such as Andhra Pradesh, for collaboration purpose. He asked the officials from Chhattisgarh to look into the functions and how this could be used in the state.

The conference featured a panel discussion on 'Emerging Technologies for Effective e-Governance', moderated by Mohd Ujaley of Express Computer. The panelists discussed the various challenges faced by Chhattisgarh and how emerging technology like cloud, virtualisation and mobility solutions could help the state in delivering people-friendly services.

Participating in the debate, G P Singh, IGP, Government of Chhattisgarh, spoke about CITIZEN COP app that he has launched in the state to improve safety, security and access to police services. He said that the app has all the necessary contact details and high-end features in an easy-to-use manner for citizens, adding that this has been possible because of reliance on technology.

Agreeing with Singh, Tripathi said, "Technology has indeed helped, but we also have to ensure it is used in best possible manner and proper cyber security hygiene is followed."

Participating in the debate, Aditya Shukla, SeMT head, Chhattisgarh Infotech Promotion Society (CHI PS), informed about the different IT related programmes run by

the state government. He asserted that the state is taking all necessary actions to ensure that government-to-citizen services are provided in a friendly way.

Sharing his views on cloud technology, Manish Lodha – Director, Sales, Microsoft India, said that cloud technology has completely changed the way people imagine the IT infrastructure. Now, they are able to launch services quickly and with less cost.

Talking about smart city projects, Avinash Bhoi, COO, Raipur Smart City Ltd, shared how his organisation is using technology in making Raipur a smart city. He said that technology is an integral part of the smart city project as there is going to be a large number of connected devices. He was of the view that with smart city, cities will have to mine the data properly.

Replying to the questions raised by panelists, Deepti Dutt, Director, Smart Cities, Microsoft India, gave a broad overview of use of ICT in a smart city. She emphasised that ICT has an immense role to play in a smart city as the smart city will be more connected and will generate more data.

After the panel discussion, Vikram Malhotra, Technology Expert from Microsoft India gave a presentation on 'Actionable Insights for e-Governance Delivery', wherein he discussed and showcased some solutions which have helped different states in proper planning of e-governance schemes.

Express Digital Education Series, Raipur focuses on tech for effective education

EXPRESS DIGITAL EDUCATION SERIES, organised by Express Computer and Microsoft India, focused on the role of technology in effective delivery of education

With the focus on 'Technologies for Effective Education', the Raipur edition of Express Digital Education Series, was organised by Express Computer magazine in partnership with technology giant, Microsoft India. Thought leaders, visionaries, policy makers and education leaders from the state came together to discuss and debate the great potential that Chhattisgarh offers and how modern day digital transformation can overhaul the existing infrastructure for state education sector.

The conference began with the address of Raghuvesh Sarup, CMO, Microsoft India. He spoke about the evolution of education and how over a period of time technology has played a critical role. He specially focused on the use of technology to address the necessities of students with special needs.

While delivering his keynote address, Vikas Sheel, Principal Secretary, School Education, Government of Chhattisgarh, spoke in detail about the impact of technologies on the lives of people. He shared details about some key initiatives taken by the state government in the area of teachers and students welfare. He emphasised that technology is being used to ensure quality education and improvement in

administration of school education in the state.

Citing an example of 'Shaala Kosh' software application for Department of School Education, he said it has enabled a real-time continuous monitoring of government schools and self-reporting of various aspects related to school education to improve the quality of education in government schools in the state. He said biometric devices are being used to monitor teachers' and students' daily attendance and ensuring their presence in school, which in turn can reduce leakages in delivery of schemes like mid-day meals, student's scholarships etc.

The conference also featured a panel discussion on 'Emerging Technologies for Effective Education', moderated by Mohd Ujaley, Principal Correspondent, Express Computer. The panelists discussed various challenges, opportunities and the role of technology in education sector in Chhattisgarh.

Participating in the debate, Kalpana Chaudhary, Group Director, N H Goel World School, emphasised on the need to incorporate technology in schools and college for students with special needs. While sharing the details about her school work on children with special needs, she said, "Technology intervention can help



schools in automating the different processes and ensuring the availability of education for students with special needs."

Sarup of Microsoft India agreed with her and informed that Microsoft was specially working in this area to bring technological solutions to help students and people with special needs. He shared about some of the global examples of use of artificial intelligence to help people with special needs to do the ordinary work easily.

On the question of how the state is trying to improve the skills of its young population, Shiv Anant Tayal, CEO, Skill Development, Government of Chhattisgarh, said that there

was greater emphasis of the government to use technology to reach out to a large number of students to impart skills and training. Sudhir Kumar Agrawal, Director, State Council of Educational Research and Training (SCERT), Government of Chhattisgarh, also informed that SCERT is making the most of the information available online to ensure transparency. In details, he elaborated about the different government schemes aimed at using of ICT in education. He specially focused on Shaala Kosh, which according to him, has been able to improve administration.

While participating in the debate, P C Choubey, Joint Director, Higher Education,

Government of Chhattisgarh, mentioned about the use of GIS technology in higher education to impart education in the state. Satheesh Ananth Subramanian, Joint CEO, CHIPS, agreed with the observation made by panelists and added that a lot has happened and more needs to be done and state is on right track in the area of use of ICT.

Replying to many questions raised by the panelists, Swati Kaushal of Microsoft India gave broad overview of cloud and other Microsoft technology. She emphasised that technology has an immense role to play in governance, education and health sectors. She advocated

for creation of sustainable IT infrastructure in the state.

A major attraction at the conference was the expert's presentation from Microsoft. Speaking on the topic of 'Enabling Productivity in the Mobile First World', Bhaskar Basu – Director, Product Marketing, Microsoft India, said that cloud technology offers a huge opportunity to meaningfully harness the data and deliver education to students which has not been done in the past. He gave a detailed overview of Microsoft Kaizala platform.

During his presentation Varun Dua of Microsoft India spoke about some of the work that Microsoft can do with Chhattisgarh government. He

presented detailed overview of 'Azure - Cloud Spark' platform. Ashish Gupta – Director, Education Marketing, Microsoft India, spoke about driving productivity with M365 in Education. In his 20-minute address, Gupta demonstrated and presented a detailed overview of Microsoft 365 Education platform.

The other major attraction at the event was the showcase of Microsoft Surface devices. Microsoft team was on the spot to give the first-hand experience of Surface devices to delegates. They informed about the different functions, features and security aspect of the Surface laptops.



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