MAHENG/2011/38968 Vol 8 Issue 4 • Pages 44 • May 1, 2018 • ₹100/- • ISSN 2456-7965

ACE UPDATE

ARCHITECTURE CONSTRUCTION ENGINEERING

NEWS ANALYSIS AND TECHNOLOGY

CELEBRATING 10 YEARS OF SERVICE

INSIDE ...

Why SMART CITIES should be green?

/aceupdate /aceupdatemag ace-update ACE Update ACEUpdate

Smart technologies that will drive smart cities

A report on some of the innovative technologies that will be integral to country's future-ready smart cities

India is in midst of rapid urbanisation. The country is experiencing stable growth in the areas of manufacturing, commercial industrialisation together with accelerating growth of IT and technology. With the rapid development of the country, urban areas are likely to house 40 per cent of India's population and contribute 75 per cent of India's GDP by 2030.

There is no such precise definition for smart city, but a city is said to be smart when it eventually runs information and communication technology (ICTs) model for governance, education, electricity, water, sanitation, and recycling, ensuring 24/7 water supply, traffic and transport systems.

Technologies that will drive smart cities:

Internet of Things (IoT):

IoT plays a crucial role in the development of smart cities. Without IoT, a smart city is not smart enough to be called as smart. IoT provides the ability to connect resources to different place and access them from one location. IoT helps in managing the assets and resource in the good of the people. IoT provides the intelligence to system and help self-monitoring the environment. Big Data infrastructure helps in easy handling of the data. IoT can be an individual system or integrated in other to work in parallel.

Anil Kadam, General Manager-Solution Architect, Schneider Electric India says, "Technology has the potential to turn cities into cost-saving, efficient urban hubs that can protect the environment and improve residents' quality of life."

The essence of smart cities is the data acquired through devices that impact every aspect of our lives, making them smart such as smart grids for better power management, smarter ways of waste management, smart traffic management and beyond. In a smart city we are surrounded by infinite bits of data and hence, the one major driver of smart cities is IoT (Internet of Things).

Kadam examines that, daily functions of the city have been in operation for years without high end technology but, the intention of growing the city from a conventional town to a smart city is to have an efficient, sustainable, digital and safe ecosystem with an aim to ensure high liveability index of the city. The smart city agenda can be achieved by efficiently leveraging technology advancements like IoT and the cycle that would run for data is: receive, correct, analyse and deliver. The city's data is received by the systems, then it is worked upon and analysed.

The one requirement from the industry is to develop a standard for data acquisition in order to create uniformity in the extraction and delivery of that data. Today, each system run on different protocols making communication on a single platform an enormous task, and since no system can run in a silo, they need to communicate with another to build a smart city, he asserts.

Schneider Electric India offers range of smart technologies for smart city focused on areas like:

- Integrated Command & Control Center (Wonder ware System Platform) and overall integration with electrical, water, buildings, transportation, surveillance, citizen applications.
- Complete value chain of SMART grid solution (FRTUs, RTUs, SCADA, DMS & OMS).
- Complete of SMART Water system (Field Instruments, sensors, PLCs, Water SCADA, WNO and WMS).
- Integrated Building Management System with associated hardware.

Technology has the potential to turn cities into cost-saving, efficient urban hubs that can protect the environment and improve residents' quality of life.

▶ *Anil Kadam, General Manager-Solution Architect, Schneider Electric India*

One solution with the potential to transform urban planning is the virtual prototype of a smart city.

▶ *Deepak NG, Director, Global Affairs, Dassault Systèmes*

Deepak NG, Director, Global Affairs, Dassault Systèmes, India says, "Traditional models of urbanisation are challenged today by the growing and increasingly diversified population in cities. Urban planners will find they need a new planning model that takes into consideration the needs of hyper-dense cities."

One solution with the potential to transform urban planning is the virtual prototype of a smart city. By creating a data-rich virtual model of the city in all its complexity, and linking it back to actual existing conditions in real-time, we can understand through simulations the potential effects of various systemic changes before implementing them, he further adds.

He adds that, "Dassault Systèmes 3DExperiencity is a significant offering in the domain of smart cities. It is a virtual platform for smart city for both existing and green field cities aiming at federating all initiatives of sustainable and efficient availability of key resources such as power, water, transport and healthcare for the benefit of the people of city and the respective state actors."

Harsh Pareek, Regional Sales Director (India and SAARC), Trimble Solutions says, "To make cities smart, there is a need to understand the behaviour of a city's assets, its environment, its citizens and their economic activities, with the intent to make the entire ecosystem predictive and self-sustainable. This intent can definitely be achieved through smart application of available technologies."

Talking about Trimble's solutions offering, Pareek asserts, "Tekla Structures, Trimble's flagship construction software, is a building information modeling (BIM) software that enables the creation and management of accurately detailed, highly constructible 3D structural models, regardless of material or structural complexity. These 3D constructible models of residential towers, office complexes, malls, hospitals and airports and other structures, are invaluable as they enable testing the actual constructability right at the design stage."

Apart from streamlining the construction process, constructible BIM goes a step further and also provides owners or managers of buildings with useful data related to various building components.

Recently, the government has announced that Bengaluru, the IT capital and the Silicon Valley of India will soon to become first of its kind smart city, with 'Smart Sure' roads running across central areas of the city. This decision comes as a part of an initiative to make the city a smart city.

Lighting

Lighting will play an important role in the development of smart cities of the future as it encompasses every area of an individual's life–home, work, on the road and in public places. Moving ahead of its functional role of illumination, connected LED lighting has the latent to improve quality of life, transform everyday experiences and services, and ensure sustainability in our ever increasing global cities. Urban populations are growing swiftly and 60 per cent of the world populations are predicted to be living in cities by 2030 with more than 70 billion light points.

Sumit Joshi, Vice Chairman and Managing Director, Philips Lighting India says, "Public lighting is installed everywhere: where people live, work, play and travel. Its primary function is to provide energy efficient, quality light to enhance public safety and enhance the urban landscape." However, he believes, in the future, a city's lighting infrastructure will also offer enormous potential to be part of a city-wide network capable of acquiring data and delivering information and services to and from millions of devices, from garbage bins to autonomous vehicles. In this way it could help enable smart city services to improve the lives of its citizens and city managers alike.

Speaking on smart cities offering, Joshi claims that, "Philips Lighting has introduced Philips CityTouch for smart cities, which are a connected lighting management platform, wherein each light point can be connected and its performance data can be sent through existing cellular networks to the city's lighting office (Industry and Energy Department) or operator.

Anuj Dhir, Vice-President and Business Head, Wipro Lighting says, "With the proliferation of network infrastructure be it Wi-Fi or cellular data in every business, houses, and public place, all major cities are destined to become smart. Internet of Things (IoT) is taking over across all domains and outdoor lighting is not an exception. Street lighting will no longer be an isolated sphere but part of a networked urban infrastructure."

With smart and connected lighting solutions, LED luminaries can be connected to network centrally controlled using software. This "smartification" will enable illumination of various urban areas - city centers, main roads, residential streets, tunnels, parks, etc.

Speaking on smart cities offering, Dhir states, "Internet of Lighting (IoL) is our first step in that direction in offering our customers best in class solutions in Lighting & Beyond. For smart cities, Internet of Lighting (IoL) will offer individual luminaire level control as per the light, time of the day, and location based longitude and latitude for smart cities."

To make cities smart, there is a need to understand the behaviour of a city's assets, its environment, its citizens and their economic activities.

▶ *Harsh Pareek, Regional Sales Director (India and SAARC), Trimble Solutions*

Connected LED lighting has the latent to improve quality of life, transform everyday experiences and services, and ensure sustainability.

▶ *Sumit Joshi, Vice Chairman and Managing Director, Philips Lighting India*

He adds, "Internet of Lighting (IoL) technology will play an important role in making our workspaces and cities more liveable, enjoyable and safer, at the same time making them more economically sustainable."

Anil Bhasin, Executive Vice President, Havells India Limited says, "The smart street LED lighting products will drive the smart cities project. LED Lighting industry has gone through tremendous evolution and has witnessed amplified growth in the last few years and one of the reasons can be attributed to the fact that LEDs are direct replacement of conventional light sources; hence the adoption process has been smooth and fast."

Speaking on smart cities offering, Bhasin states, "Havells is geared up to revamp street lighting with its innovative LED solutions that will help saving thousands of watts of electricity in the country. We are providing an end-to-end solution, right from conceptualising, design, in-house production to installation, testing and commissioning including maintenance. We are also offering a centrally-controlled monitoring system (CCMS), which enables remote-controlled and scheduled operations of the lights, energy analysis, fault monitoring, etc."

Anirudh Kajaria, Business Head, Century LED says, "Street lights are doing more than ever in today's smart cities. Smart lighting is now helping cities to save energy, lower costs, reduce maintenance and serving the pedestrians in a better way, with street lights creating a network canopy."

Speaking on smart cities offering, Kajaria claims, "Century LED offers street light ranging from 20 watt to 240 watt. The features like sturdy aluminium body, corrosion resistant make its weather durable. High efficiency and long life LED chip are used in modules to ensure better lumen output." 'solis' street light is made with 120 degree beam angle.

Rambo Zhang, Country Head, Opple Lighting says, "LED technology was a costly affair initially but with time and technology developments they have become cheaper and governments are encouraging people to cut their energy use these and thus contribute towards sustainable environment. Conserving energy is one major thing that LED light companies are looking forward to."

Earlier the use of incandescent bulbs was high and they could be easily seen in our home which sometimes created a dark effect and was quite prone to heat. But technology has changed a lot since then and also has our home styles, Zhang further adds.

Transportation

One of the key components of smart cities programme is creating and developing an efficient urban mobility and public transport system that provides a variety of transport options. Towards this goal, government has approved numerous large projects within the scope of the urban infrastructure development, especially in road transportation. Under the smart cities scheme, Government of India has already set aside ₹ 50,802 crore ($ 7.6 bn) for the project with a proposed budget of ₹ 48,000 crore ($ 7.2 bn) to be utilised for developing first 20 smart cities.

A key enabling technology is the intelligent transportation system (ITS), in which various transportation mechanisms cooperate to improve quality of life by reducing fuel/electricity usage, decreasing congestion, and decreasing travel time. Studies have shown that enormous resources are wasted by congestion alone in transportation systems.

Water treatment

One of the major pillars of smart cities is the adequate supply of clean water along with sanitation and efficient waste management system which is a key challenge faced by many tier I and tier II cities in India. In 2010, India ranked 120th among 122 nations in terms of quality of water available to its citizens.

Intelligent water management systems are critical to making smart cities successful. As per WRG Report, 40 per cent of Indian citizens may not even get sufficient drinking water by 2030. Therefore, smart water should be considered as a crucial factor when building smart cities. It is important to make sure that our current and future cities have intelligent water and waste water treatment systems in place to efficiently manage this precious resource. Grundfos has pioneered such a solution and it is called Demand driven distribution (DDD).

Conserving energy is one major thing that LED light companies are looking forward to.

▶ *Rambo Zhang, Country Head, Opple Lighting*

The demand for high-end street lighting products has also risen and will drive the smart city project.

▶ *Anil Bhasin, Executive Vice President, Havells India Limited*

Smart lighting is now helping cities to save energy, lower costs, reduce maintenance and serving the pedestrians in a better way.

▶ *Anirudh Kajaria, Business Head, Century LED*

Street lighting will no longer be an isolated sphere but part of a networked urban infrastructure.

▶ *Anuj Dhir, Vice President and Business Head, Wipro Lighting*