SMART CITIES

EXECUTION HOLDS THE KEY

What exactly is a smart city? It is difficult to strictly define a smart city. Generally speaking, a smart city is a city that deploys technology to make its functioning as efficient as possible, enhancing wellbeing through reduced costs and resource consumption and active engagement of the resident population, all in an ecologically sensitive manner.

However, there is no fixed template, no one-size-fits all plan along the lines of which a smart city is built. The concept of a smart city is fluid, one which adapts to fit itself to the different needs of the citizens of different cities according to their different priorities. Yet, just as it is possible to broadly define a smart city, there are certain common structures that need to be implemented to make a city 'smart.'

What makes a city smart?

So what goes into making a city smarter? A patchwork of different technologies and infrastructure, which seamlessly mesh together to make all aspects of a city's functioning as efficient as possible.

It is a complex system of processes. But it is possible for us to break it down into two broad parameters that form the framework on which a smart city is built –

"So what goes into making a city smarter? A patchwork of different technologies and infrastructure, which seamlessly mesh together to make all aspects of a city's functioning as efficient as possible," says Chandrashekar Kakal

vertical elements and horizontal elements.

The vertical elements are the projects in areas like surveillance, healthcare, transport, utilities, education, governance that need to be implemented to make a city smart. The horizontal elements are the capabilities that enable these projects to be implemented. To simplify it further, the horizontal elements form the foundation on which the vertical elements are built.

Examples of vertical and horizontal elements

Vertical elements

● **Smart Surveillance:** This is an important element of a smart city, as it is about ensuring the safety and security of its citizens. It involves placing cameras and sensors at critical points enabling authorities to monitor the movement of people via a central control room. Smart surveillance projects are gaining steam in India and Surat has already commissioned a city surveillance project. Larsen & Toubro has bagged a contract to install 6000 cameras in Mumbai, while the Aam Admi Party has also laid out the placement of 1.5 million cameras in Delhi as a key item in their manifesto.

● **Smart Governance:** Smart governance takes the process of administration online, simplifying it to enable swift resolution of issues and deepening the engagement of citizens with the decision-making process. It is not a new concept and is being applied by several state governments in the country, with the eventual goal of moving every citizen-government transaction online.

● **Smart Transport:** Smart Transport encompasses several aspects - from toll road simplification via automatic deduction of charges to the use of technology to help

reduce congestion. Smart cards that enable multi-modal transport, capturing traffic offences via cameras, on-line inquiries and schedules of public transport are all examples of smart transport. The concept has been further extended to include online taxi reservations, real time car pooling and identification of vacant spots in a parking lot.

● **Smart Utilities:** Deploying technology to efficiently manage water and electricity usage are absolutely critical elements of a smart city. Smart meters and sensors that analyse a city's consumption pattern and regulate the supply of water and electricity as per demand go a long way in conserving a city's resources.

Creation of smart grids by electricity distribution companies to minimise power outages, load balancing, smart metering and payment collections are examples of electricity distribution management in a smart way. Leakage detection in water pipelines, better metering and billing to monitor consumption accurately are essential towards smart water management.

● **Smart Communication:** High-speed internet connectivity, city-wide WiFi and uninterrupted network availability on a 24X7 basis make cities smart in all respects. Public address systems in case of a mass communication need, alert messaging by linking mobile phone numbers of citizens to a centralised database and a command centre to co-ordinate efforts in case of any disaster will require an intelligently designed communication system across the city.

The above list of vertical elements is by no means exhaustive. It can be expanded to include smart environment, smart education, smart health care, smart buildings, smart parking and so on. But all of these verticals would collapse unless supported by the foundation provided by the horizontal elements.

Horizontal elements
● **Infrastructure:** All smart programmes require basic, physical infrastructure like civil, electrical, temperature control, fire and safety and communication. In addition, all the data required for the 'verticals' to function

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effectively has to reside in data centres equipped with IT infrastructure for storage, back-up and recovery.

In case of a greenfield smart city, it is possible to create common infrastructure that can support different programs but in an evolving city where different government departments are at different levels of 'smartness maturity', co-existence of various kinds of physical and IT infrastructure is unavoidable.

● **Communication:** The physical IT hardware needs to be supplemented by communication infrastructure — communication lines, routers, switches, modems, antennae — which are an essential part of a smart city's IT backbone. Open lines of communication need to be maintained at all points - from the source of data, to data centres where the data resides, to command centres where it is monitored until it reaches individuals who can then act on that data.

● **Sensors and Edge equipment:** The data has to be collected from the source using sensors. CCTV cameras, for instance, in the case of a surveillance project and meters in the case of electricity and water management.

● **Command centres:** The collected data needs to be viewed, monitored, analysed and actioned on. Central command centres would need to be constructed to fulfil these functions. In case of a city surveillance project, it may be located at police headquarters with localised viewing centres in different parts of the

city for quick responses.

● **Common Software:** Transaction processing systems such as Enterprise Resource Planning (ERP) software, self-service portals, business intelligence and analytics software may cater to one or more areas of smart programs. Standardisation of some of these would result in lower upgrade and maintenance costs in the long run.

● **Domain applications:** This refers to specialised and domain specific software which is tailor-made for a specific smart project and supplied by specialised software product vendors. In case of a surveillance project for example, video monitoring and analysis software is at the heart of that specific program.

● **IT Services:** These refer to the various services required at different stages of implementation of smart systems—from consulting services to conceptualisation, to operation and maintenance. Services from one or more companies may be required to design, build, test, install and operate the systems.

Execution challenges
There is no dearth of ideas and concepts to make a city smart today. Several departments, states and central government agencies are already implementing smart projects. But the real challenge lies in executing a city-wide master blueprint.

A smart city is a fluid concept that goes beyond just the mere incorporation of technology to run a city. It needs to be adapted to the specific needs and priorities of the city it's being implemented in. What works for Paris or London may not necessarily serve as the ideal template for Mumbai. The priorities are different for Indian cities and they need to be defined by the government. We need to do is deploy smart technology in our cities to make them liveable. Essentially, the smart cities are liveable cities.

The government's target of establishing 100 smart cities in India is laudable and achievable. But the challenge in implementing this vision and the scale of the task should not be underestimated.

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