

Smart Cities 2.0

How India is Integrating IoT for Urban Sustainability

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Introduction

India is one of the few nations that has shown an immense growth in technology and the Internet of Things (IoT). To increase the economy and to better the quality of living, the Government of India has come up with a project on June 25, 2015, called the Smart City 2.0 mission. The main motto of this mission is to enhance the country's IoT, a sensor that gives real-time data information, if it's mounted in a particular location or a city. The Ministry of Urban Development (MoUD) takes responsibility for executing this plan.

The Main Objective of the Smart City 2.0 Mission is:

- To develop the country's waste and sewage management
- To reduce traffic congestion
- To provide proper infrastructure
- To offer a pollution-free environment
- To ensure the safety and security of the data
- To digitize all the transactions for accountability and transparency.

How IoT can help in Smart City Development:

1) IoT in traffic management:

IoT provides maximum advantage in the case of heavy traffic. The real-time data sensors detect traffic through regular surveillance and give proper information to the system so that there is no congestion among vehicles.

2) IoT in waste detection:

Digital sensors attached to bins help us to understand when they are empty and when they are full. So that at the right time, all the wastes are taken and kept for the next round of collection. With IoT, it is easier to help the public.

3) IoT in checking pollution:

IoT helps in analysing the conditions of the air and its moisture level, thus helping in controlling pollution. A Pollution-free environment increases the quality of living for the people located in the particular area. IoT also helps in weather forecasting and its changes in patterns by giving informed details.

4) IoT in managing data security:

The IoT sensors can easily detect any incoming or unknown ID that is trying to interrupt the system, thereby providing safety and security to the users.

5) IoT in infrastructures:

IoT helps in constructing proper infrastructures such as buildings, roads, parks, dams, and malls in cities. They give proper monitoring of the land and the area so that the builders and architects understand the layout better and can construct proper structures.

6) IoT in Transactions:

The digital transactions help monitor money transferring from one account to another, thereby giving account transparency.

Other importance of IoT:

1) Safety of people:

It gives an alert to security forces if there is any unusual activity on the roads, thereby ensuring people's safety.

2) IoT in Fire Management:

It alarms the fire service personnel if there is any fire outbreak in and around the city.

3) IoT in electricity usage:

If the streetlight is damaged or if there is any electricity shortage and irregular power cuts in cities, they can be timely sensed by IoT devices.

4) IoT in Biometrics:

IoT in biometrics can bring notice to organisational management in regards of employees' entry and exit in the buildings. For example, there is ZkTeco, which helps platforms like MinervaloT integrate IoT in biometrics, thereby maintaining sensitive data.

5) IoT in disaster management:

IoT installed in Surat helps caution the city if there is any storm or any natural disaster that may possibly occur in the city, so that the respective disaster management takes control of the situation and prevents damage from occurring in the city.

IoT and AI usage:

IoT collects data and information, and AI makes the best use of that data so that there is an improvement in the efficiency and sustainability.

Limitations to IoT Implementation

- With the number of people in the country comes the enormous amount of data. India is a country with a rich population, and therefore securing all the data is very complex and challenging. With data and information sharing each day, the MoUD should come up with a plan to protect private information.
- Installing IoT devices in cities requires proper signals and high bandwidth. Providing very small and basic facilities to some cities has been difficult so far. So, building such great infrastructure is a heavy task that takes lots of time and effort.
- Due to different policies in different states, there is no regulation. Due to the diversity of the regions, guidelines are different, and this has created discrepancies among the decision makers situated in different places.

Some smart cities in India

It is said that 63% of the country's GDP comes from the cities. The Smart City Mission has been implemented in some of the major cities in India to increase efficiency and to boost the country's economy. These cities are said to have overcome the challenges caused by IoT.

- **Pune:** Pune IoT systems navigate traffic and parking, and thus help people save fuel. IoT also supports electricity and sewage collection so that the respective authorities can effectively carry out their allotted responsibilities.
- **Bengaluru:** Bengaluru, also called the Silicon Valley of India, is one of the few cities to adopt Technology and has become famous for its IT hub. IoT-installed water management helps detect damage in pipelines. The city has also paved the way to provide internet connections to make life easier.
- **Surat:** IoT facility in Surat introduces an Integrated Command and Control Centre (ICCC) to regulate traffic flow in the city. It makes it possible to online check the water level. CCTV cameras around the cities provide proper surveillance of the city's safety. It also has an IoT system connected to disaster management.
- **GIFT City (Gujarat International Finance Tec-City):** This city is focused on creating a financial hub for the global market. It has provided solar panels for electricity, and facilitated ways to build green buildings, which leads to a pollution-free environment.

Scopes of IoTs

IoT has lots of potential to harness India's smart cities. IoT has to address all the challenges that are stopping it from further growth.

Routes and ways need to be found to compress the complex data. So that real-time information is gathered about a particular person, place, or any source of material.

Improvement is needed in terms of providing Wi-Fi with high bandwidth. IoT devices in weather forecasting and disaster management should be used in every city to protect residents from natural calamities.

More concentration is given to fasten the country's economy by improving efficiency and sustainability.

Conclusion

It is very clear that IoT can definitely help India in achieving its project Smart City 2.0. India's potency lies in the smart way of carrying out methods and the smarter execution of the project. IoT and AI can bring tremendous change in the country. As Indians, it is very important that we need to cooperate with the government policies and norms. Together, it is possible that we can make not just cities smart, but every nook and corner of the nation smart.