

# **PROJECT OBJECTIVE**

TEAM ID	PNT2022TMID48693
PROJECT NAME	Smart waste management system for metropolitan cities

## **ABSTRACT:**

The Internet of Things (IoT) paradigm plays a vital role for improving smart city applications by tracking and managing city processes in real-time. One of the most significant issues associated with smart city applications is solid waste management, which has a negative impact on our society's health and the environment. The traditional waste management process begins with waste created by city residents and disposed of in garbage bins at the source. Municipal department trucks collect garbage and move it to recycling centers on a fixed schedule. Municipalities and waste management companies fail to keep up with outdoor containers, making it impossible to determine when to clean them or when they are full. This work proposes an IoT-enabled solid waste management system for smart cities to overcome the limitations of the traditional waste management systems. The proposed architecture consists of two types of end sensor nodes: PBLMU (Public Bin Level Monitoring Unit) and HBLMU (Home Bin Level Monitoring Unit), which are used to track bins in public and residential areas, respectively. The PBLMUs and HBLMUs measure the unfilled level of the trash bin and its location data, process it, and transmit it to a central monitoring station for storage and analysis. An intelligent Graphical User Interface (GUI) enables the waste collection authority to view and evaluate the unfilled status of each trash bin. To validate the proposed system architecture, the following significant experiments were conducted: (a) Eight trash bins were equipped with PBLMUs and connected to a LoRaWAN network and another eight trash bins were equipped with HBLMUs and connected to a Wi-Fi network. The trash bins were filled with wastes at different levels and the corresponding unfilled levels of every trash bin were monitored through the intelligent GUI. (b) An experimental setup was arranged to measure the sleep current and active current contributions of a PBLMU to estimate its average current consumption. (c) The life expectancy of a PBLMU was estimated as approximately 70 days under hypothetical conditions.