# **IoT in Tackling Food Waste**

**1. Roles of IoT**

**Issue 1: Reduce Fraud**

A company’s way of barcoding can be unique to their business. Therefore, any attempt to replicate their labels to get illegal foods into the supply chain will become much harder. Hence, scope for fraud can be slashed immediately

**Issue 2: Product Labelling**Businesses are seeing a change in consumer expectations when it comes to product labelling. People are more interested in where their food comes from and how it was grown, harvested, manufactured into a food product and shipped to shop.By increasing the visibility of products across the supply chain, IoT can improve traceability from farm to fork, meeting consumers’ expectations for greater transparency. → Using barcode labels fixed to products, or RFID labels fixed to pallets (and read in batches by fixed readers), businesses can more easily trace products as they flow through the supply chain.

**2. What are the infrastructure needed?**

* **Internet infrastructure**

Deploying IoT technology is relatively simple. As far as possible you need to try to provide internet coverage across your supply chain. You can knit this together by installing Wi-Fi not just in your fulfilment centres and warehouses but also at farms. Where you don’t have wireless coverage – e.g. as delivery vehicles move across the country – you can use 4G networks.

* **Barcodes or RFID labels and the appropriate scanning devices.**

Barcode or RFID labels allows product details to be placed on all items so that they can be tracked using handheld or fixed readers across the supply chain – from the farm to processing site, to wholesaler, to your depots and on to your shops and warehouses. You will need a variety of scanning devices that are capable of being used on the road, in the cold store, outside, in busy warehouses to cover all these requirements.

**3. Other ideas for using IOT in addressing waste management systems**

1. **IoT- Smart bins**

* retrofitting existing garbage bins by adding connected sensors to make them “smart bins”.
* Sensors detect level and weight of garbage, transmitting this information to a server deployed in the city’s Data Center through existing cellular infrastructure.

1. **IoT- Food Digester Machine**

* An aerobic bio-digester that disposes most food waste safely within 24 hours. EcoBio digests food waste, reducing vermin proliferation and odour.
* The product discharged is a dried compost that can be used as fertilisers for agriculture (depending on the input). This benefits both the user and the environment.
* Alternative to food waste disposal where food waste can either be recycled into nutrient water for agriculture or disposed as slug

4**. IOT challenges in waste management process**

**Challenge 1: Connectivity challenge**

For waste management, internet coverage across supply chain is needed not just at fulfilment centre and warehouse but also at farms. The iot devices must be able to connect to a server that can capture and process the data. IoT technology.

Due to the nature of the business which requires IOT in less connected areas such as warehouses and harms, it might be difficult for the company to enable the usage of such IOT devices. As a result, they turn to cellular networks to Cellular.

However with cellular, the downside is the recurring monthly charge for data use, this can increase the expenses from using cellular data

**Challenge 2 : Different Communication Standards**

There as there will be several implementations of IoT systems across the food supply chain, non-vertically integrated organizations need to cooperate when it comes to defining a common standard in terms of:

* API access
* Identification mechanisms