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# IoT Concepts for Improving the Resource Efficiency of Food Supply Chains

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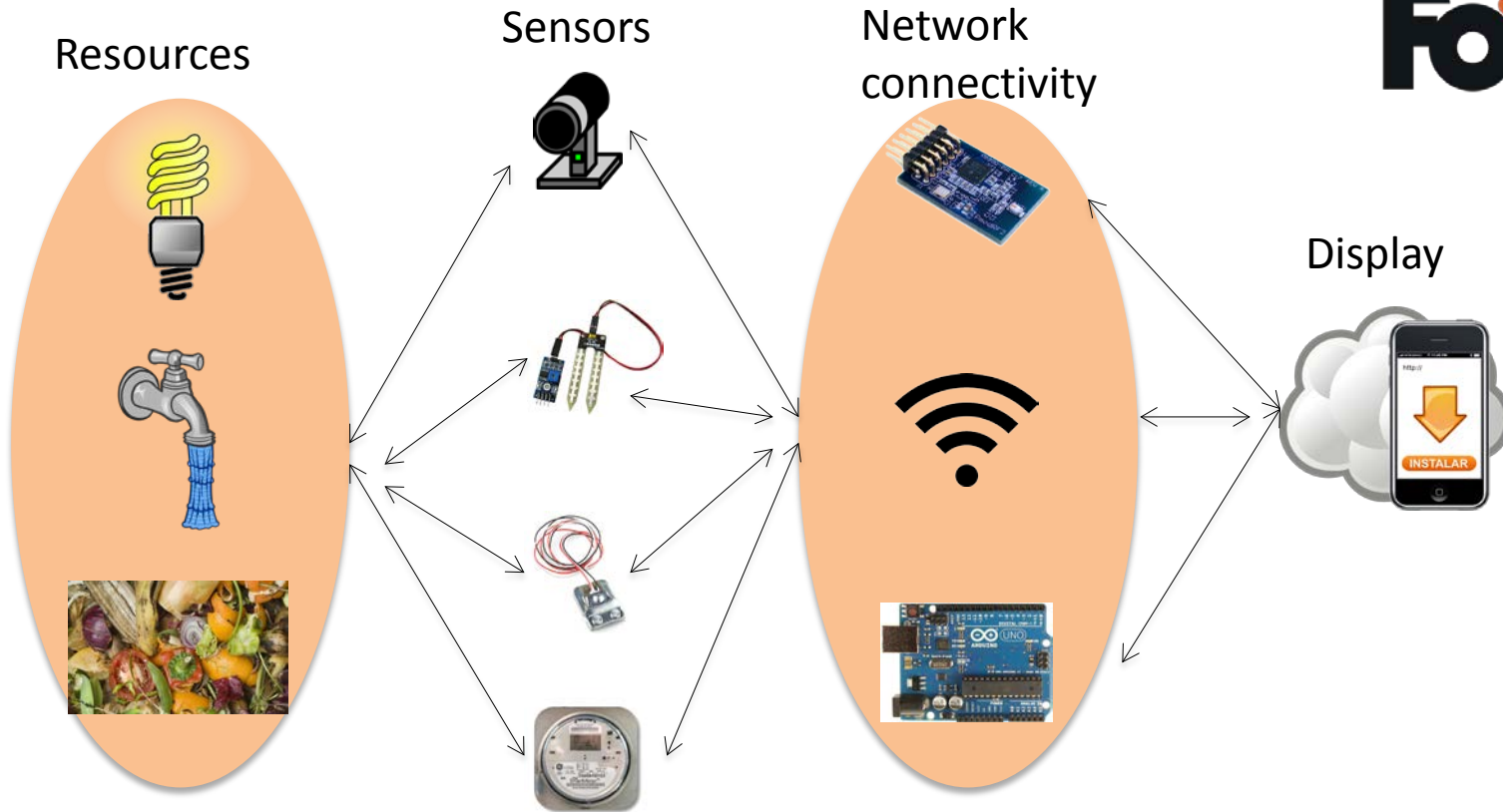
Loughborough  
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UNIVERSITY OF  
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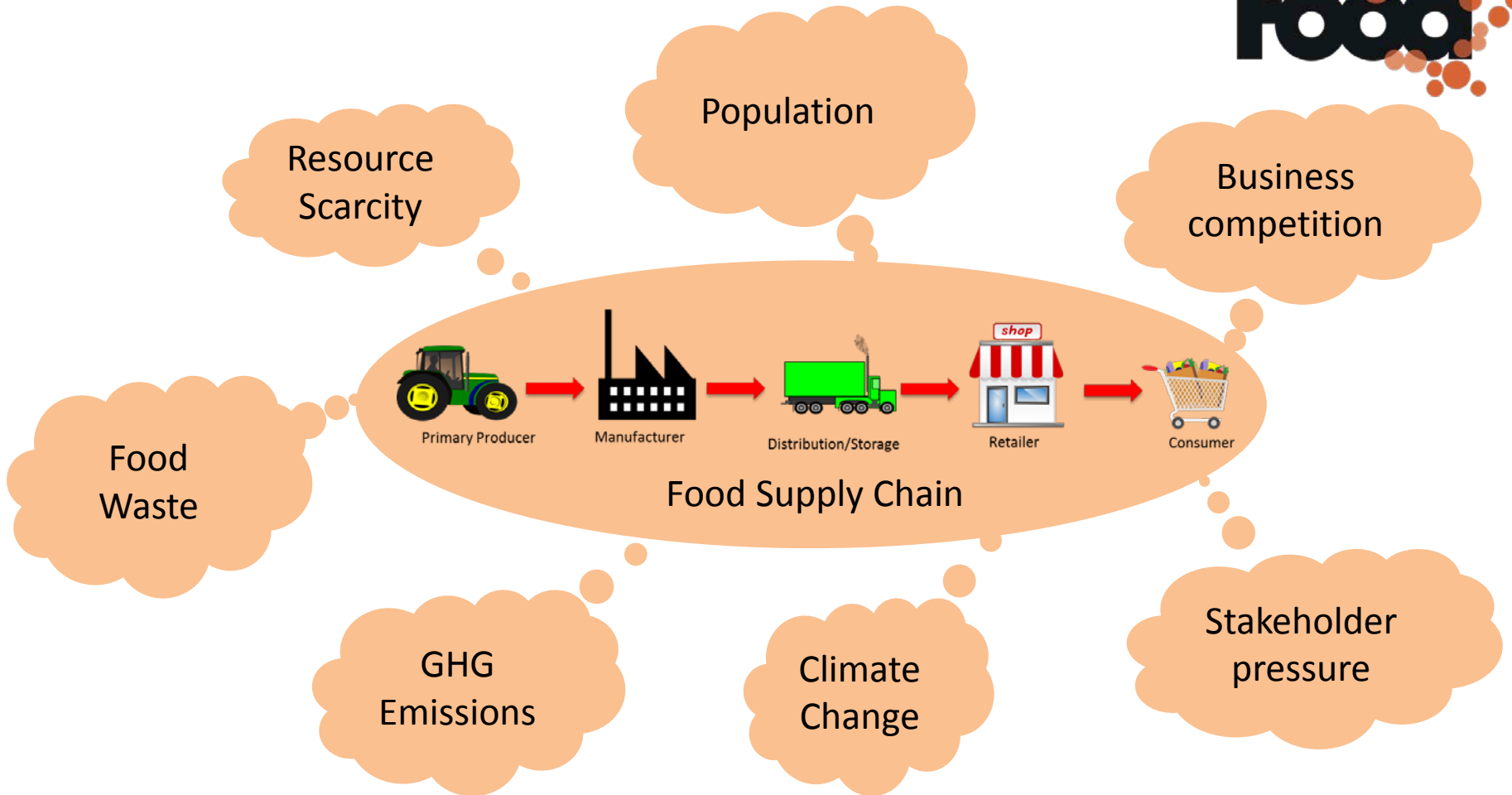
- **Definition of IoT**
- **Research Justification & Aim**
- **Review - State of Art**
- **Example IoT Application– Food Waste**
- **Conclusion**

# IoT Definition



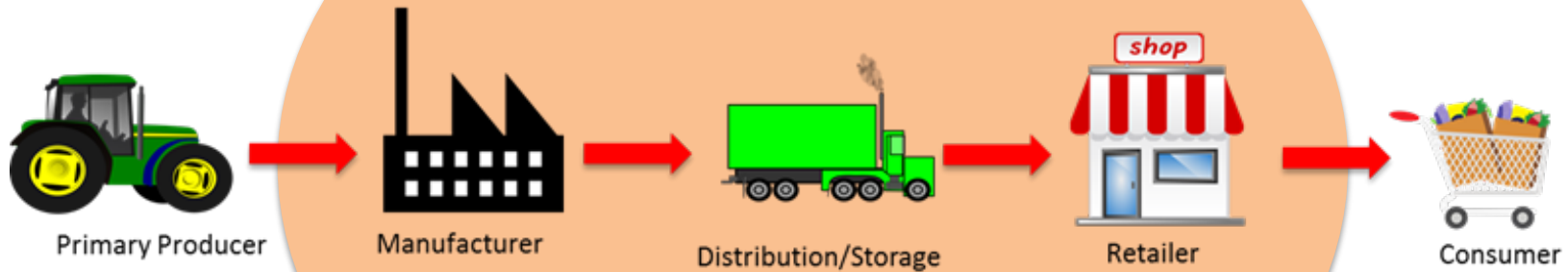
Network of interconnected things/devices -Embedded with sensors, software, network connectivity and necessary electronics that enables them to collect and exchange data

# Research Justification



# Research Scope & Aim

Scope - Post farm gate to retailer shelf



Food Supply Chain

Aim – To utilise the recent advancements in IoT to improve the resource efficiency of FSC by providing greater transparency and provision of targeted information and knowledge to support decision making.



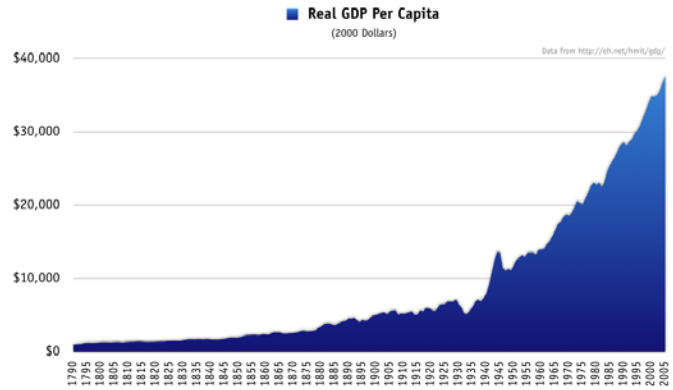
# Review – State of Art



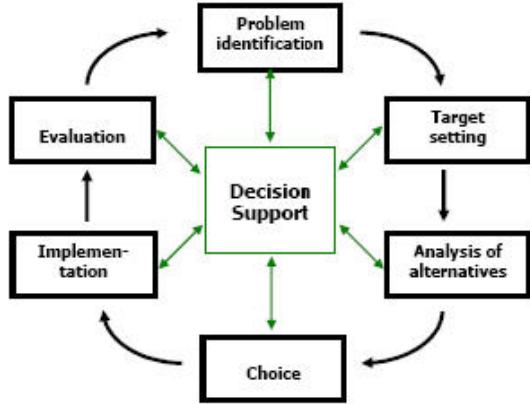
Unawareness of detailed resource consumption



Real-time data- Accurate resource consumption patterns



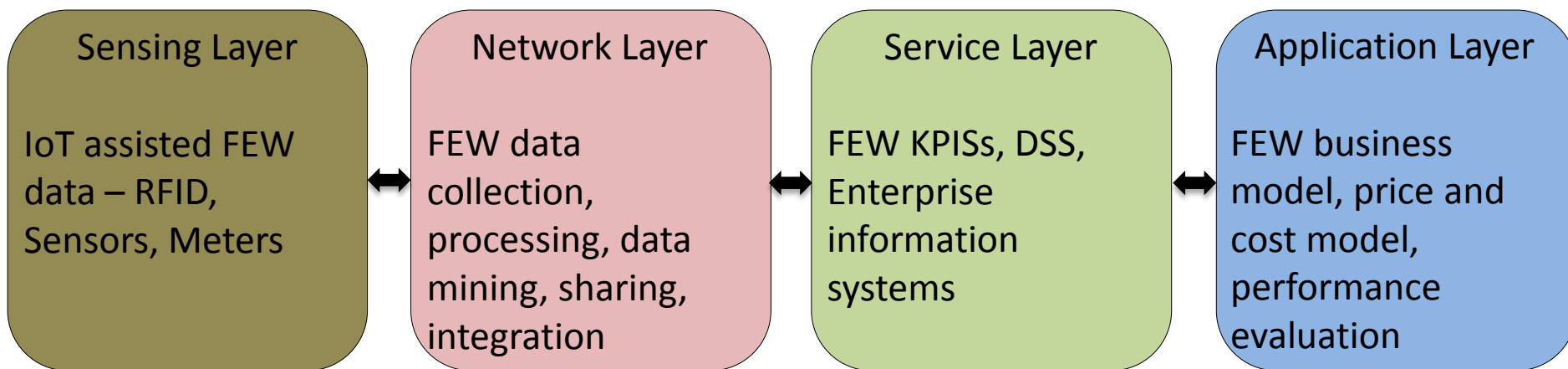
Supports decision making process



# IoT Architecture for Resource Efficiency in FSC

## Focussing on 3 resources

1. Food Waste (F)
2. Energy (E)
3. Water (W)



# Example Application – Food Waste



## Problem

- 19% of food waste occurs post-farm gate to retailer shelf in the UK.



## Aim

- To drive the resource efficiency by reducing the food waste.



## Solution

- An IoT-based solution to reduce the food waste.



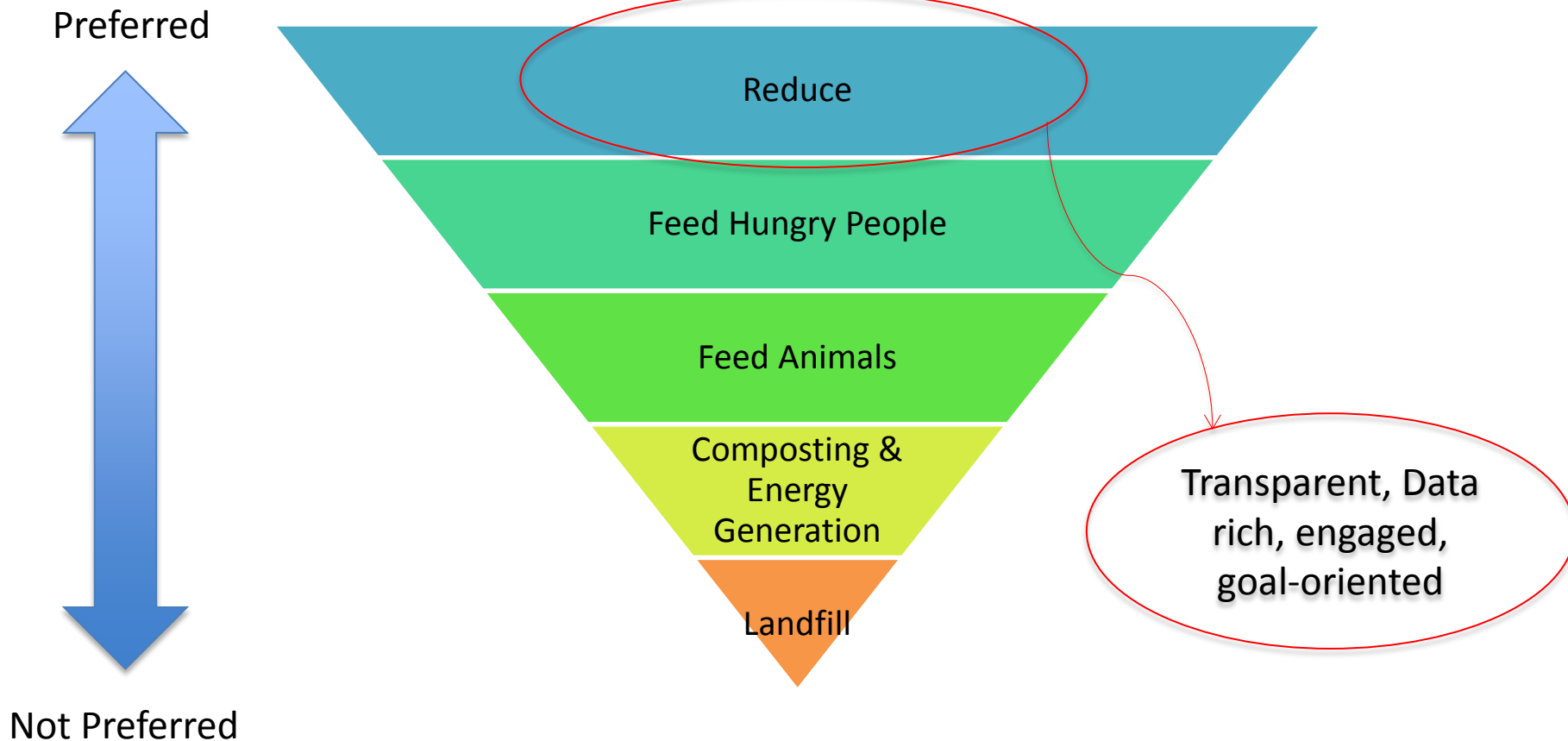
# Why do we generate food waste?



- Overproduction – To complete orders in full
- Rejection – stringent standards, not safe
- Industry needs– New launches, sales promotions
- To reduce labour cost – big batches are introduced
- Customer satisfaction – convenience, choices, wide availability



# Food waste hierarchy



# Challenges in reduction of Food Waste



Difficult to  
measure

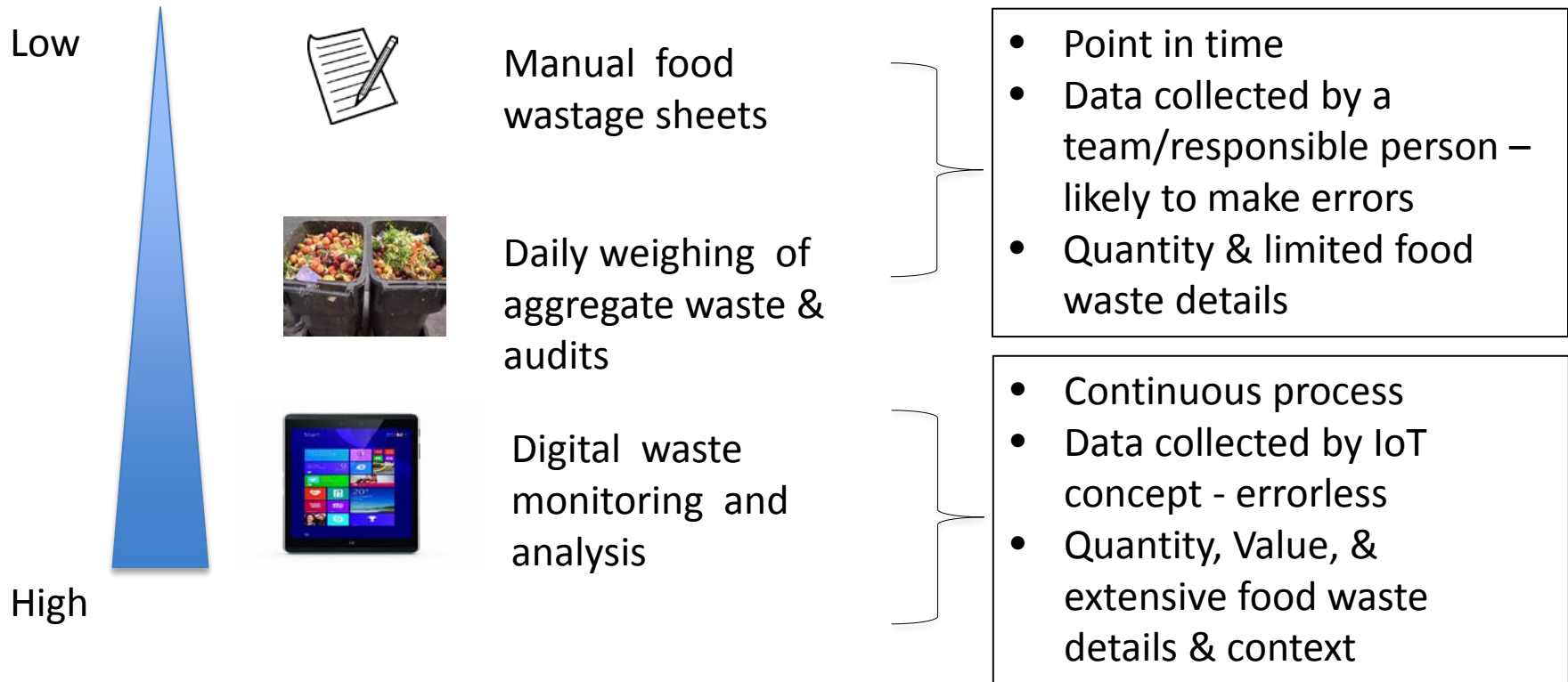


Traditional tracking  
methods not  
accurate

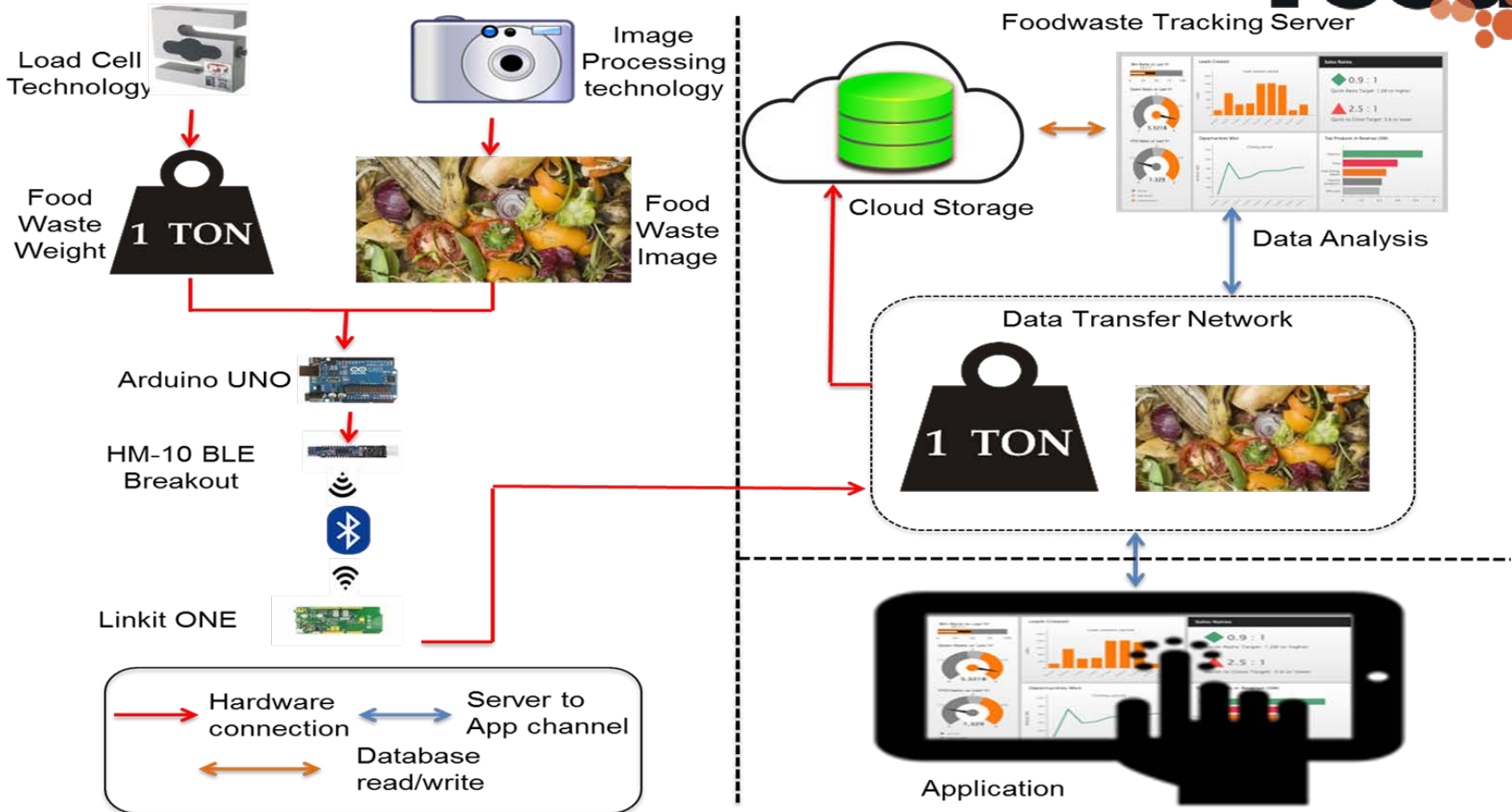


Lack of detailed  
analysis

# Level of Insight & Impact of Digital monitoring



# IoT Solution for Food Waste



Reference architecture for measuring food waste



## Conclusion

- **IoT definitely helps in understanding the sustainability benefits of collecting, integrating and using real-time data.**
- **Improved, resource efficient and resilient food supply chain**
- **Detailed measurement can lead to 50% reduction**

# Thank you



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