

**Interreg**   
EUROPEAN UNION

**North-West Europe**

**REAMIT**

European Regional Development Fund

# Application of Big Data and IoT sensor technologies in agri-food supply chains. Introduction to the REAMIT project.

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BY

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LEVSTONE

NOTTINGHAM  
BUSINESS SCHOOL  
NOTTINGHAM TRENT UNIVERSITY

WHYSOR



SenX™



WD MEATS

Valorial  
MAKING FOOD SMARTER



REAMIT stands for:

Improving **R**esources **E**fficiency of  
**A**gribusiness supply chains by **M**inimizing  
waste using **I**nternet of **T**hings sensors





## REAMIT: The challenge

- Food waste is a global problem and is particularly high in the developed world (i.e. North West Europe region)
  - 88M tons or € 143B wasted per year
  - 35% of food waste in EU-28 has occurred in agri-supply chains
- EC call to: Reduce-Reuse-Recycle (3-Rs) => through **increasing competencies**



## REAMIT: The focus

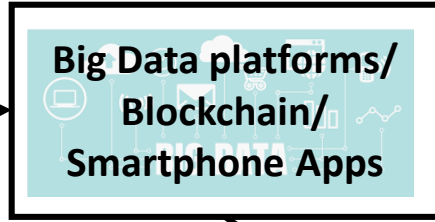
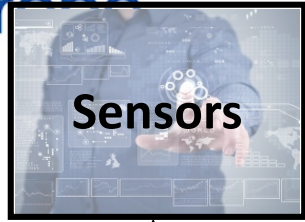
- REAMIT focuses on fresh food (**fruits, vegetables, fish, meat**)
- REAMIT demonstrates the power of IoT sensors and Big Data technologies in improving resource efficiency of agri supply chains.
  - To deploy IoT sensors for reducing waste and hence improving resource efficiency of the agribusiness supply chains (fruits/vegetables/meat/fish) anywhere between farm gate until food reaches the supermarket or final consumer.
  - To collect the data in the cloud and conduct big data analytics to identify sources and patterns of food waste with a view to tackling them.

## **REAMIT: The objectives**

- Reduce waste of fresh food in agri-supply chains of North West Europe by at least 10%
  - Save 1.8 Mt of food waste or €3B per year
  - Avoid 5.5 Mt/yr of CO<sub>2</sub> emissions
- Any reduction in food waste will increase productivity
  - Due to the amount of resources (water, nutrients, fertilisers, etc.), food waste saved is much more than the value of waste and can have significant social and environmental benefits.
  - Link to CO<sub>2</sub> emissions above

# REAMIT: The approach





- Sensors will monitor and record food quality along the supply chain
  - **Traditional sensors:** temperature, humidity, light, etc.
  - **New sensors:** Raman Spectroscopy, 3D Fluorescence
- Waste reduction is achieved by supporting owners of food at risk using
  - Big Data Analytics
  - Artificial Intelligence
  - Decision Support Systems

- **Big Data Analytics**
  - Identify “food at risk”
  - Identify patterns of food waste in the North West Europe region for supporting suitable policy actions
- **Artificial Intelligence and Decision support systems**
  - Decision support to food owners for making rapid decisions to save food including redistribution to nearby consumption points (local stores and food charities)
  - Optimisation of food delivery points based on real time food quality monitoring
- Food owners, truck drivers and warehouse managers will be connected using a dedicated Smartphone APP

## REAMIT technological impacts

Environmental  
Economic  
Technological  
Societal

- ✓ *8 operational solutions will be developed and tested*
- ✓ *They can be adapted to real-life scenarios for demonstrating the use of the proposed decision support systems*
- *How might an ‘**Online food supermarket**’ in The NL benefit from these solutions?*
  - *Improve quality of fresh food delivered to customers’ homes*
  - *Improve consumers’ satisfaction, reduce consumers’ complaints*
  - *Increase volume of food delivered to consumers’ homes*
  - *Optimise the route of the vehicle, optimise the use of resources during food transportation (e.g. energy)*
  - *Decrease volume of wasted food in each route / day / week / month*
  - *Decrease carbon footprint => Enhance company’s position as ‘green’*
  - ***Enhance the company’s competitive position in the market***

# Thank you!

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