SISTERS - Innovative actions at the logistics stage

June 3rd, 2022

NeXT GeN EU

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IMaR – Intelligent Mechatronics and RFID

Dr. Pat Doody – Director and Head of Advance Studies

40

Research Engineers & Scientists

Electronic & Mechatronic Engineering
Computer & Data Science

120 +

Industry Partners

Across all Sectors
AgriTech
Manufacturing
Pharma
Food

50

Project Completions p.a.

50 Satisfied Clients p.a.
All industry collaborations

€2.5 M

Project Funding p.a.

€1.5M SFI co-funded
€1.0M EU, EI & Other

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Objectives of WP2

Innovative action plan at the logistics stage

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Objectives

- To optimize containers to transport food implementing a sensors kit to track food safety & quality conditions.
- To co-create an architecture of the sensor kit for achieving a scalable solution.
- To develop a sensor platform suitable for use with the BULKBOX and STOREBOX containers.
- To validate the effectiveness of the smart containers (BULKBOX and STOREBOX) via piloting.
- To guarantee optimal food safety and shelf-life of the tested fresh produce with the smart containers.

SMART CONTAINERS: Designing containers for fresh food produce transportation with cutting-edge sensors with respiration studies and creation of an atmosphere suitable for each specific product. This will be applicable to bulk food products from the production stage (called BULKBOX) and packed products after processing (called STOREBOX). The performance of the two containers will be validated via piloting (case studies).

BENEFITS: to diminish food losses during transportation thanks to efficient and reusable containers with real time visibility of all assets and instant alarms allowing immediate reaction. This innovation will be highly replicable to other food segments, so the impact in the European Food System will be huge. Moreover, saving of energy consumption will be achieved thanks to the lower transportation needed to treat the food waste generated.

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Workplan

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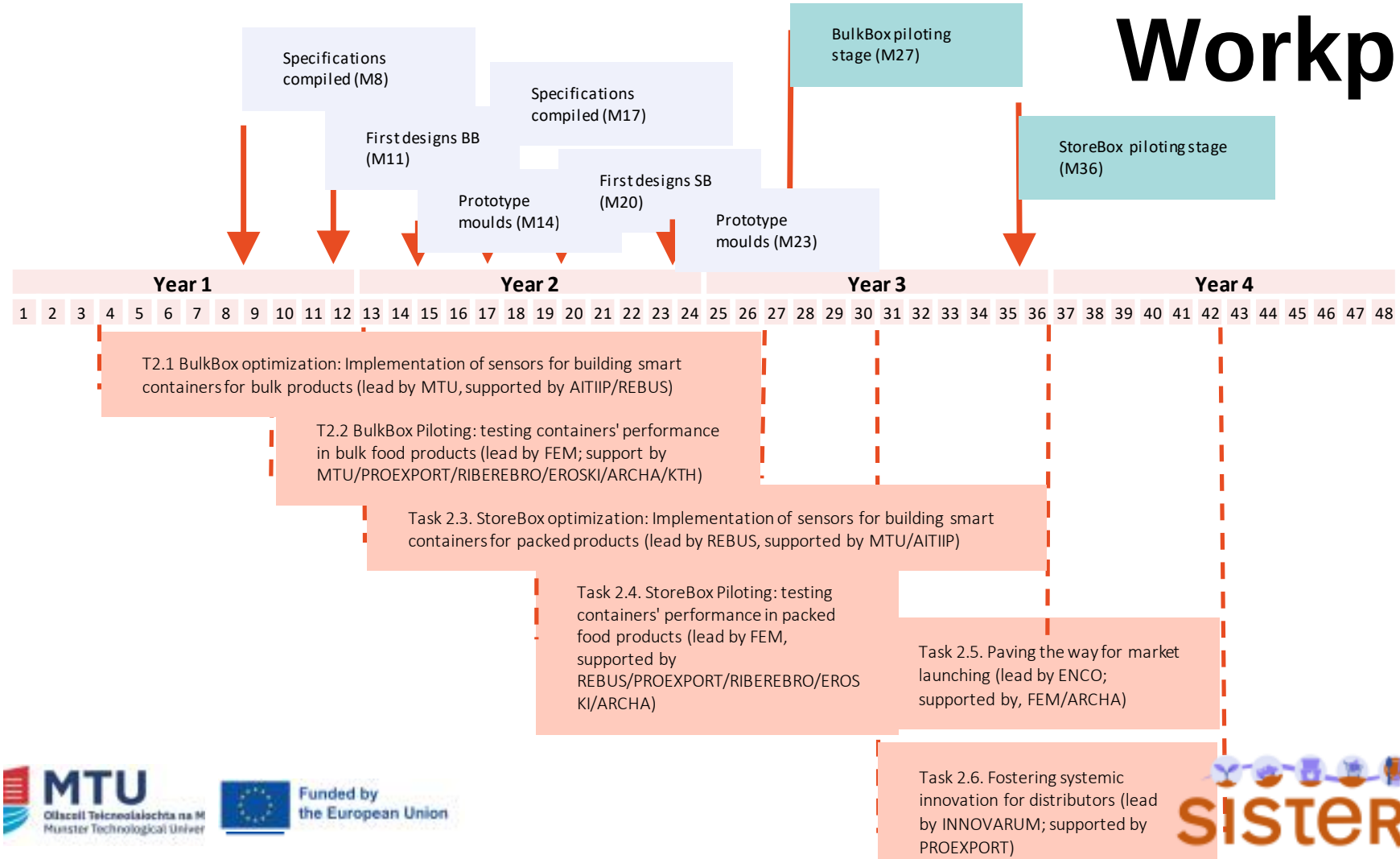
Workplan



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Containers - BulkBox

aitiip centro tecnológico

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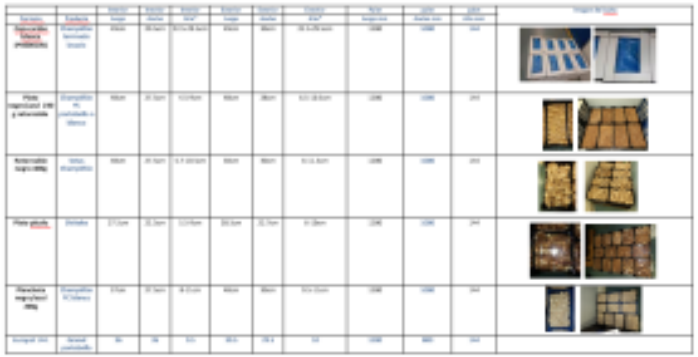
T2.1 BulkBox optimization: Implementation of sensors for building smart containers for bulk products

The conceptual definition of the container design starts with the necessities for the transportation and necessities of the Bulk Box and the validators:

- Guarantee the **tightness** of the assembly (no incursion of dust, dirt, etc.)
- Protect the merchandise stored inside.
- Guarantee its rapid removal, promoting easy and safe handling, transport, etc.
- **Stackable or foldable**.
- Stability under loads.
- Minimum possible weight and maximization of transported weight.
- **Promote air recirculation** inside the container.
- **Size of the boxes and conventional transport characteristics**.



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T2.1 BulkBox optimization: Implementation of sensors for building smart containers for bulk products

	Length (mm)	Width (mm)	Height (mm)	Volumen (l)
Bulk Box 1	1200	1200	650	936
Bulk Box 2	1200	1200	450	648
Bulk Box 3	1000	800	650	520
Bulk Box 4	1000	800	450	360

Different strategies have been studied and presented to validation partners in the food industry

The foldable pallet with European measurements is the most co[illegible]

T2.1 BulkBox optimization: Implementation of sensors for building smart containers for bulk products

HB1210: 1.200 x 1.000 mm
HB1210: 1.200 x 1.000 mm
Height custom made

HybridBox - Industrias Alegre (ialegre.com)

Rápido

Con solo un movimiento el contenedor entero se puede doblar con sus interiores dentro en solo 15 segundos.

Boxes, Boxes industrial, Boxes plastico, Pallet boxes (altoplast.com)

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Sensors - BulkBox

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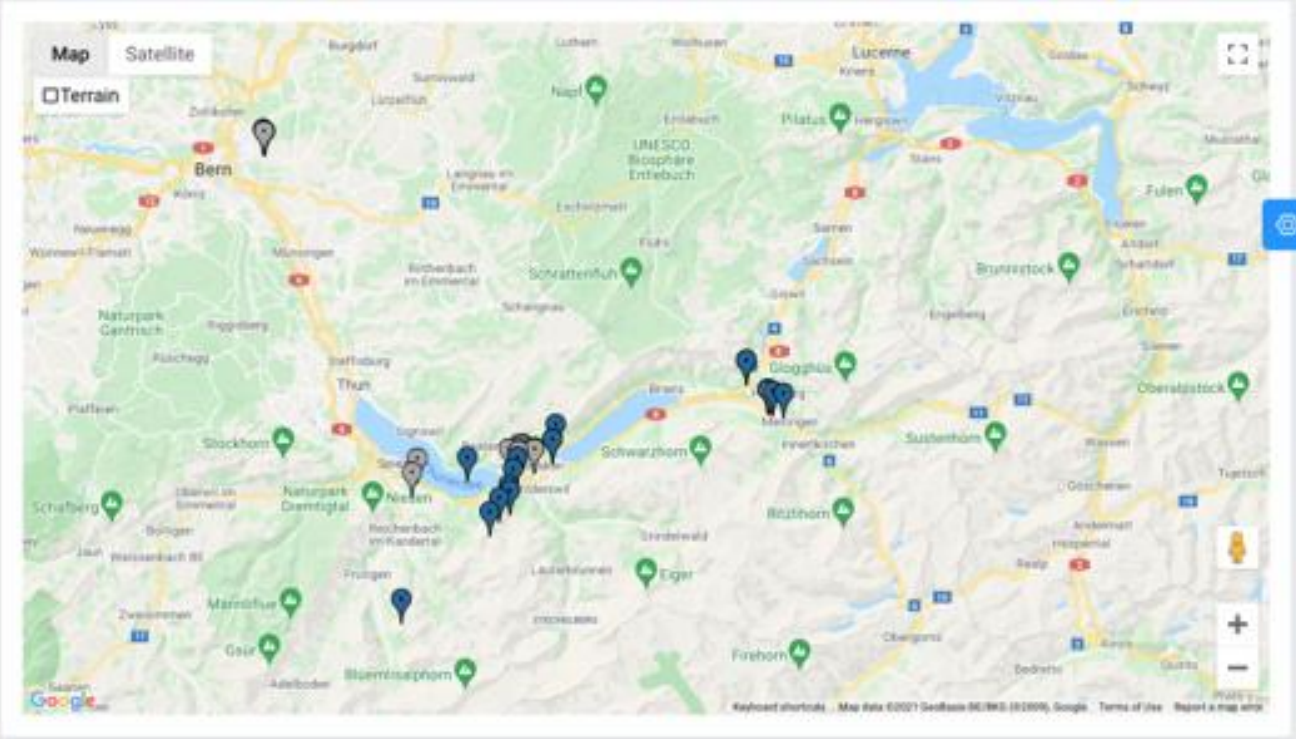
SYNAPSE

One platform to engage all

Synapse allows all Rebus Labs devices to connect, store and display data and generate business intelligence for customers.



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TECHNOLOGY

4G / 5G Cellular

Autonomous Connectivity

WiFi, BLE, GPS

Position Tracking

RFID

Identification & Data Transfer

Satellite

Secure Off-Grid Connectivity

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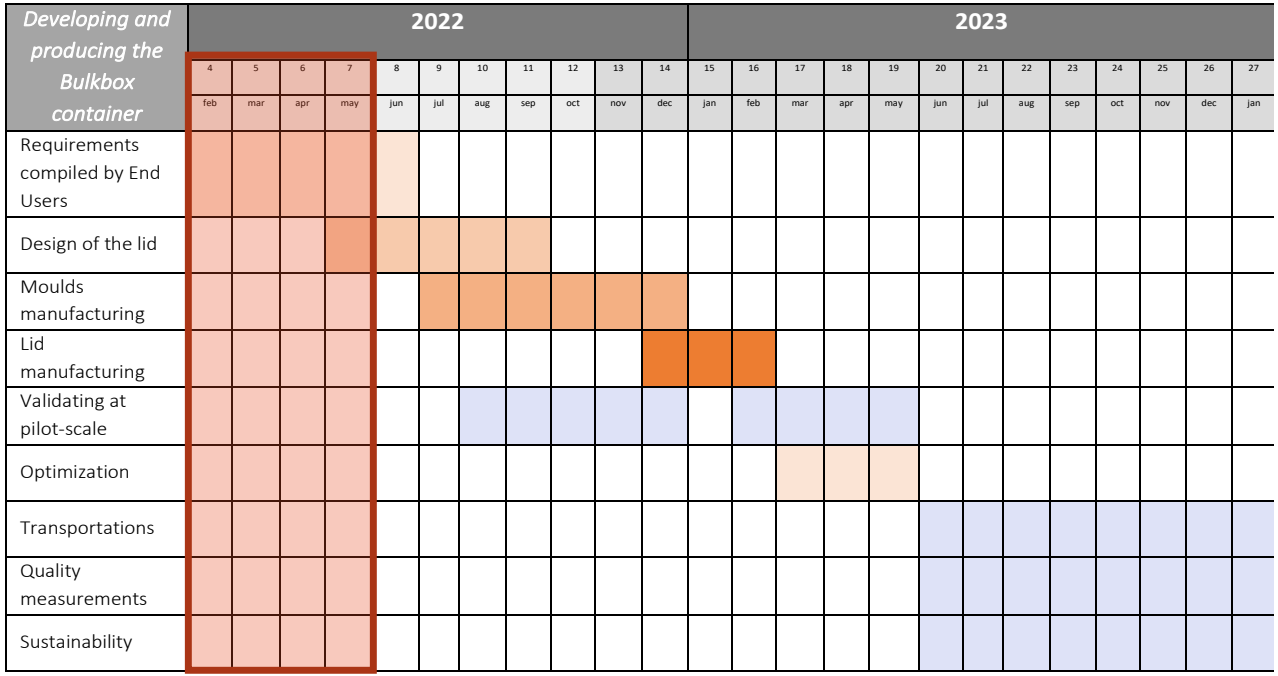
Progress

T2.1 BulkBox optimization: Implementation of sensors for building smart containers for bulk products

- ✓ Requirements compiled DONE
- ✓ Design of the lid STARTED
- ✓ Moulds/inserts design for the adaptation of the box to an Smart box (STARTS M9)
- ✓ First prototypes ready in December (M14)



Conclusions

- Positive progress in the selection of suitable containers
- First Sensors Prototype Deliverable in M9
- Planning of Bulkbox Trials starting in M10
- StoreBox Task (2.3) starting in M13

Thank you!

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Follow the project's social media channels!