



Alliance for IoT
and Edge Computing
Innovation

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BRUSSELS

AIOTI
DAYS 2024

AIOTI AWARD 2024

Trusted Food Waste Control Based on Visual Evidence (TRUFLE)

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The Team

inlecom

inlecom

Enhancing innovation capacity through digital ecosystems

Research. Advancing Technology. Disruptive Business Models

Research & Innovation Consultants.

Established in 1996 with presence in Greece, Belgium, Ireland and the UK

Strong participation in Research Projects. Bringing innovation to industry.

28 ongoing projects, 5 coordinating.

> 40% proposal success rate vs EU <10% average.

> 35 EU-funded completed projects.

> successfully granted patents (80% success rate).

AI@TI

AI/ML, NLP, Digital Twins and Computer Vision

Digital Twin Simulations

Decision Support Systems

Predictive modelling

Semantic and Textual Analysis

Machine Vision Processing

Distributed Ledgers, Smart Contracts and Encryption

Material Tracking Solutions (blockchain)

Smart Contracts for data/material/processes, NFTs

Data Safety

Advanced Security Mechanisms and Identity/Trust

Management

ICT Solution Design, Integration and Proof of Concept

ICT Platforms, Edge Processing, Big Data Processing

Data and System Integration

Data Fusion

Smart Visualization and User Interface

Background and Aims

*Food waste is not just a problem,
it's a reflection of our values and
priorities as a society*

- **The annual FOOD WASTE in the EU:**
 - 59 million tonnes
 - 131 kg/inhabitant
 - 132 billion euros
- **8.6% of EU citizens are unable to afford a proper meal every other day** (EUROSTAT 2023)
- **Food waste management remains critical and open issue at global scale**
- **True scale of food waste is still not fully measured** and remains **underexploited**
- **Questioned Link of Food Redistribution with true scale (and food sources)**

Challenges

- **A disconnected network for food redistribution (food banks etc.) with limited transparency**
 - Lack of an efficient, and secure **method for recognizing and quantifying collected food surplus/waste**
 - **Lack of reliable and consistent capture and traceability of food waste & food surplus** leads to severe socioeconomic and environmental impact
 - **Lack of a trusted information-sharing** between donors, food redistributors and non-profit organizations serving the end-beneficiaries (charities etc.)
- **Challenges of trusting information sources**
 - qualitatively (data origin, user-signed, location/demographics etc.) and
 - quantitatively (waste volume, type/nature etc.)
- **Missing linking of accurate reporting with incentives (sustainability)**

- **More efficient control and management of food waste**
- **Trusted sources of reporting**
- **Trusted sources for incentivized reporting**

Solution

A trusted information-sharing network complemented by a smart mobile app for reliable information capture and broadcast

Food waste & surplus recognition, Capturing Food to be Wasted



Food to be wasted

*User taking images of food wasted
(Genuine, user generated content)*



Food Recognition, Quantification, Characterization and Signature

- *Quantification of wasted food (ML/DL)*
- *Signing data with user location, identity*
- *Data claims in Verifiable Credentials*
- *Decentralized Identity Wallet*
- *Self-Sovereign Identity approach*



Smart Contracts and Network Registry

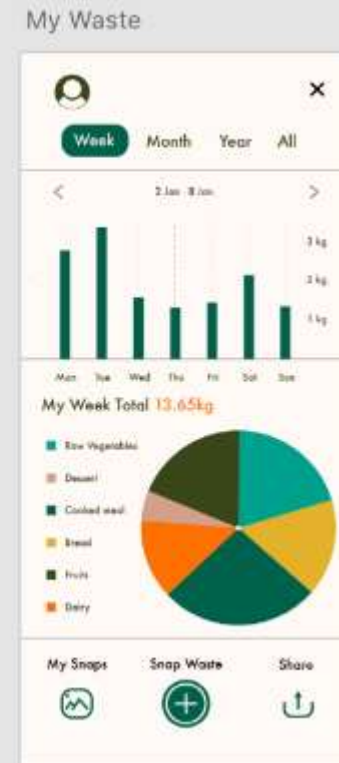
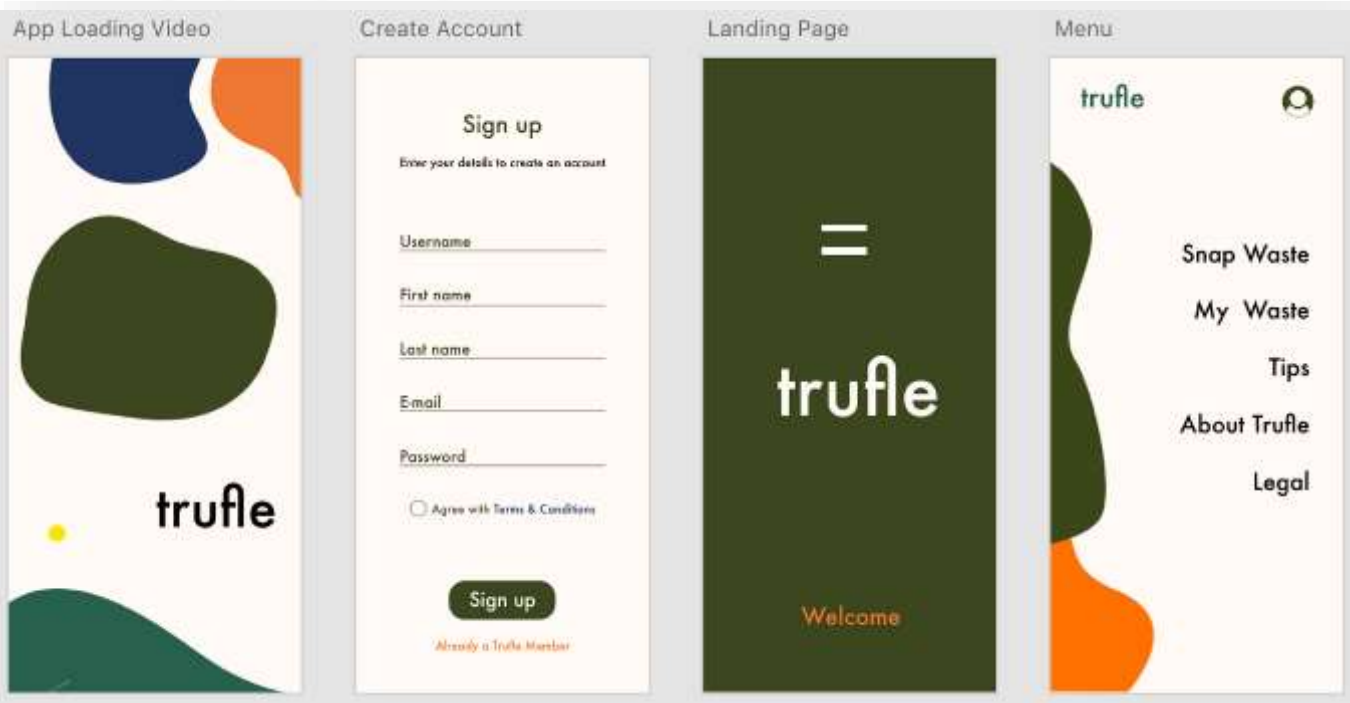
- *Minting of food waste NFTs (truffleNFTs)*
- *Verifiable Credentials registry (location, food quantity etc.)*
- *Smart Contracts registry*

Solution

- **Trusted User-Generated Content (food waste)**
- **Automated food waste & surplus recognition, quantification and tracking**
- **Secure monitoring and sharing of transactions** (Distributed ledger) for increased visibility in food redistribution networks
- **Reliable proof of location/validity of amount of food wasted** by a specific consumer
- **Trusted food waste information and data reporting** by citizens and retailers



Solution



Conclusions

- **Human-centric approach**, relying on genuity of user generated content and taking advantage of cutting-edge technologies (BC, DL) to prove data validity/origin/identity
- Decentralised Identities rooted in blockchain and NFTs (Non-Fungible-Tokens) provide a reliable, **accurate and transparent solution for food waste registration and tracking**
- **Tamper-proof and Trusted user-generated data** using Blockchain to increase the level of trust in the **exchange of information** among actors of the food supply chain (management and classification)
- Contribution towards a more **sustainable and efficient food supply chain**
- **Increase value of information** of reported food waste by increasing its confidence levels (proof of validity and location)
- Introduce a high-trust and transparency level that contributes in **more efficient food waste management through better control of (trusted) citizen's data**
- **Commercialization** stream in cooperation with Food Banks and Food Donours



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Thank you for your attention!

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VOTE FOR US!
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