

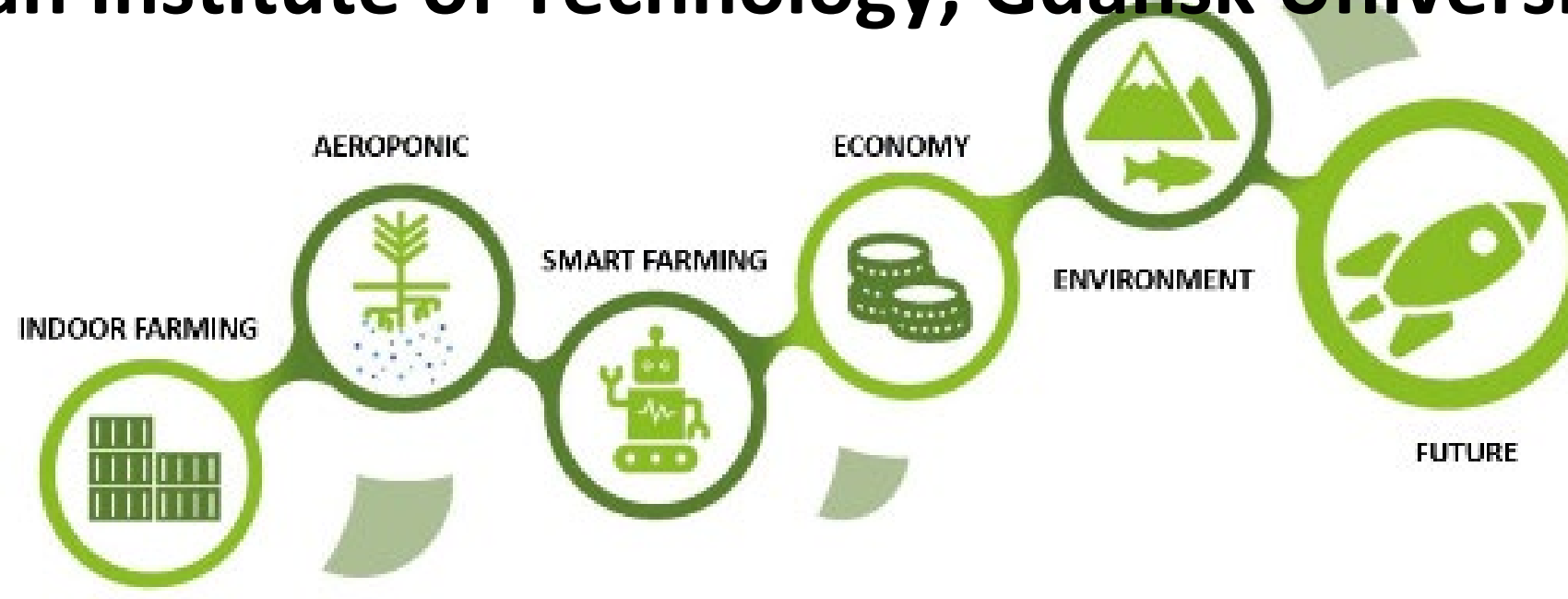
# UC11 - AI-supported Industrial IoT for Indoor Food Production

Lead Partner: TTTech Industrial Automation Partners: ZelosPlant, Austrian Institute of Technology, Gdansk University of Technology, Research Studio Austria

## Objectives

We are focusing on using advanced technologies such as **artificial intelligence, autonomous control loops, and secure real-time communication** to optimize food indoor cultivation, drawing insights from the **Arrowhead** framework.

## AI tools and methods



### NLP Pipeline

The NLP pipeline has three stages, as shown in the figure: Data gathering, Data extraction, and the Training stage.

#### Stage 1: Data Gathering

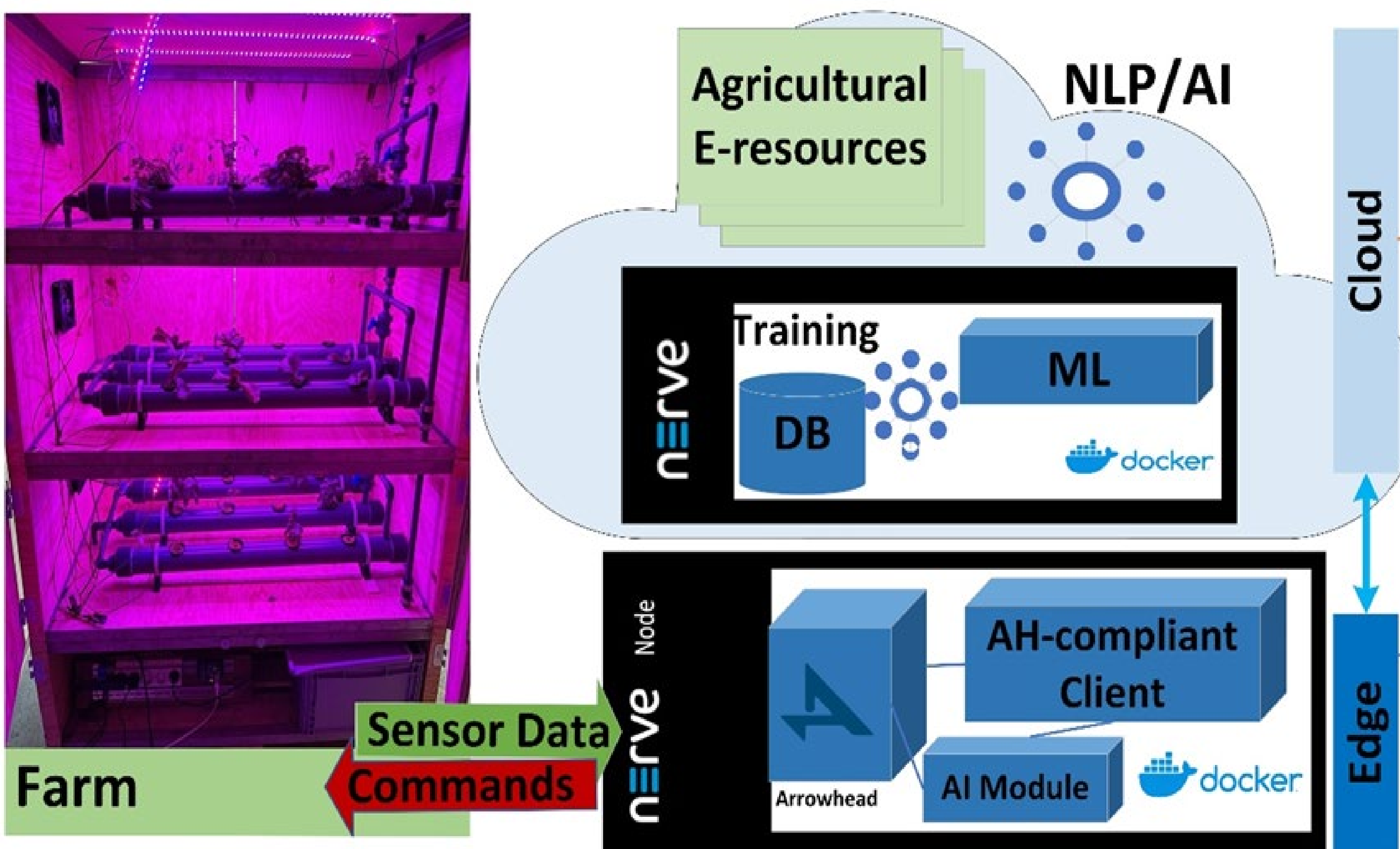
- Literature on Indoor Vertical Farming
- 83 PDFs and URLs

#### Stage 2: Data Extraction

- Text preprocessing
- Clean Text

#### Stage 3: Training

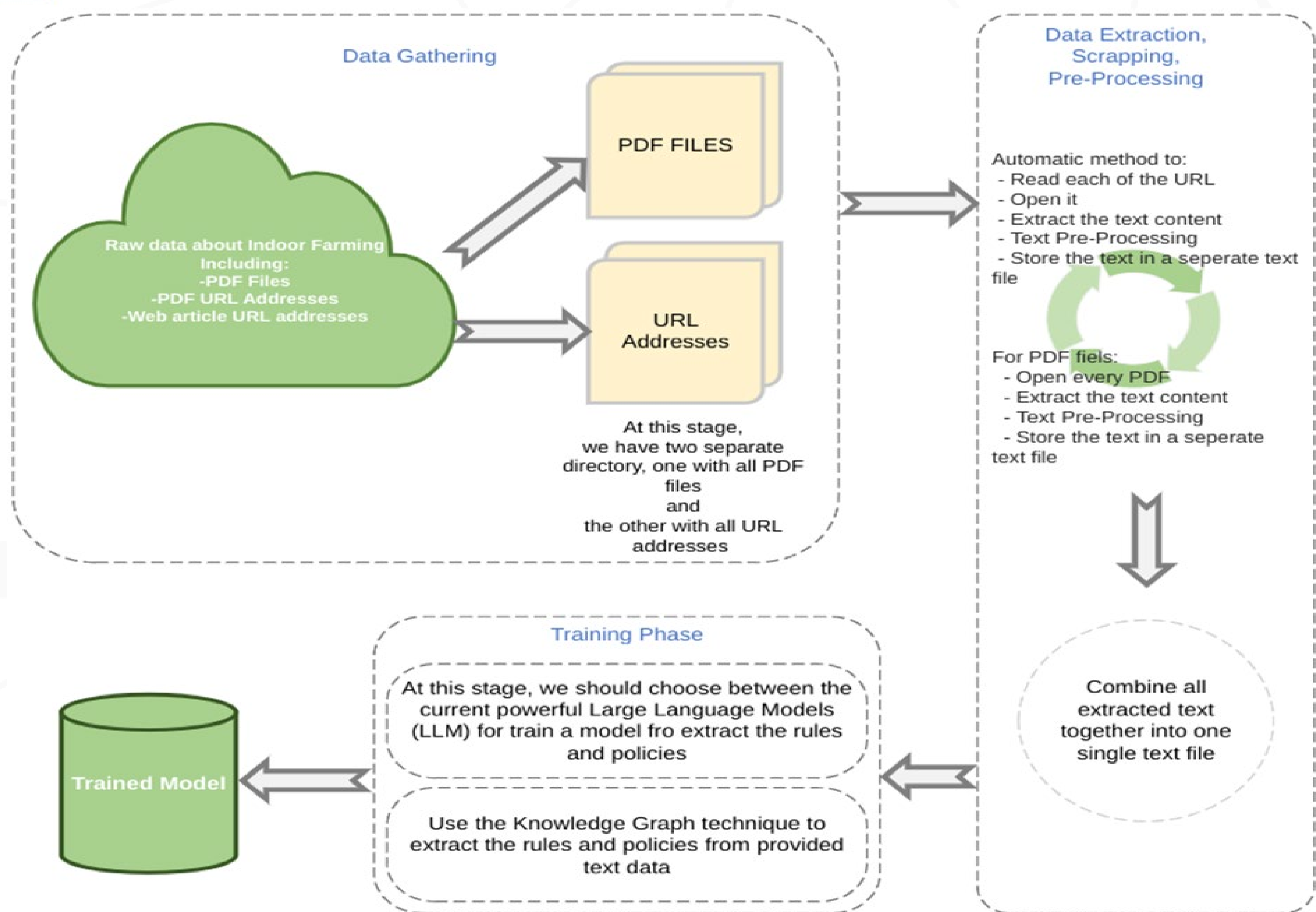
- Transformer approach
- Knowledge Graph approach



## Outcomes/Results

### Cloud-based edge computing platform for IIoT solution

- To **manage multiple services at the edge** and establish a link between them, TIAG will integrate Docker Compose workloads.
- With, a **multi-protocol data gateway** (OPC UA, S7, MQTT,...), TIAG will support data acquisition from sensors and controlling of actuators



### AI-based mechanisms for reliable wireless communication security

- For reliable and **efficient wireless connectivity**, GUT will work on an AI-powered cross-domain communication gateway.
- Using a switched beam antenna and Bluetooth transmitters, GUT has designed and built a dedicated testbed for initial testing and data collection.

