



### UC description

The objective of **Demo 2** is to monitor workforce and machinery within a construction area, by deploying a WSN that provide information about the status and location of the workers in real time. This information will be managed through an IoT platform, registering possible dangers and alarms, apart from establishing a protocol in case of emergency.

- To obtain: Alarms to avoid accidents, data from the interaction between machinery and workers to make predictions and to be able to apply corrective measures
- Outputs: location, time and worker and machinery involved in each alarm, heat map
- Challenge: With this solution, the risk of accidents involving machinery and workers will be reduced, improving traditional health and safety systems, focusing the action in the vision of zero injuries at construction sites.

### FRACTAL Components

Platform: Versal

Relevant Components in UC1 DEMO2

WP4T44-05 IoT Gateway	(ZYLK)
WP5T54-01-01 MLBuffet development	(ZYLK)
WP5T54-01-02 Training module for ML Buffet	(ZYLK)
WP5T54-02-01 Docker Swam	(ZYLK)
WP6T54-02-02 Kubernetes	(ZYLK)
WP5T54-03 MLOps Toolchain	(ZYLK)
WP6T61-01-01 Operating System – Ubuntu	(HALT)
WP6T61-02-01 Docker	(HALT)
WP6T61-03-02 Tensorflow	(OULU)

Technical aspects to be addressed:

- HW acceleration:
  - What are accelerators used for?
  - Is there support for the use of accelerators?
  - Can accelerators be used in containers?

### UC Components

Developed specifically for the UC1: 3 building blocks for the AI Component

Alert predictor: the model determine if the relative position of workers and machinery constitute a hazardous situation.

Alert classifier: It tells the user the nature of the alarm (machine-machine, worker-machine,...)

Anomaly Detection: It detects what events in a time-series formatted dataset have special features. This model tells when the algorithm failed or succeeded in its predictions.

Dependencies with components provided by WPs:

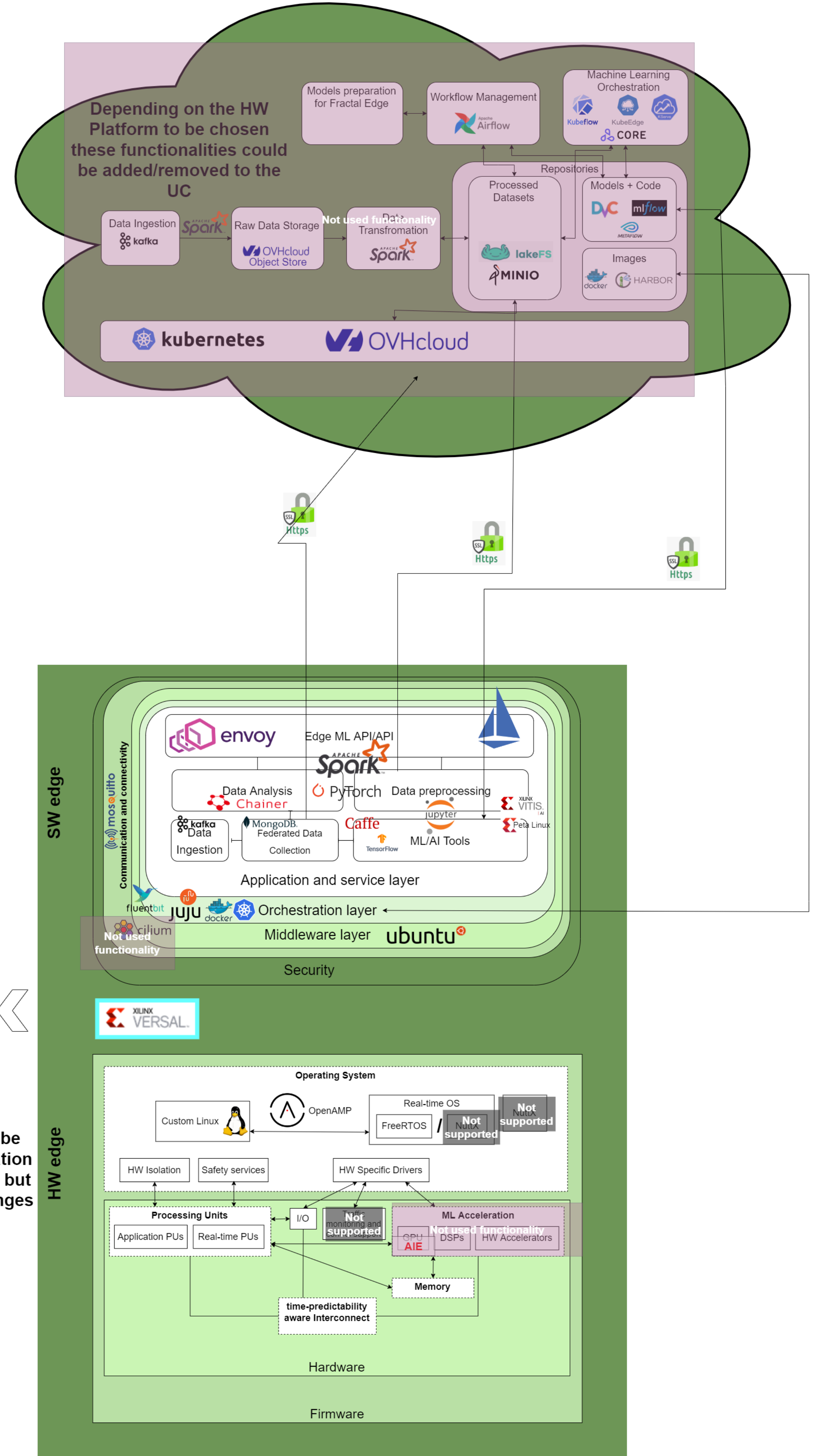
HW acceleration

### KPIs

Technical KPIs:

Real-time response capabilities (Yes/No)

The model works better when the number of people in the scenario can be detected automatically (Improved quality with people detection)



HW Platform still to be defined. HW Acceleration not contemplated yet but this is subject to changes

