CUSTOMER USE CASE #1

Predictive maintenance on water pumps

BRAINIUM
Intelligence in a real world

WHY DID THEY CHOOSE BRAINIUM

Water Utilities have a wide range of assets that are in need of monitoring and predictive maintenance.

Typically, a high proportion of these assets are un-connected and suffer the following:

- High operational costs when assets fail.

- High capital costs to build in redundant capacity to protect against un-foreseen asset failure.

- Fines related to non-compliance and customer satisfaction issues.

They chose Brainium as it is a ready to use solution to start Predictive Maintenance of their water pumps.

POC SCOPE

- **Location**: Nordic region

- **Pump stations**: Clean and Waste water pumping stations with multiple physical pump configurations
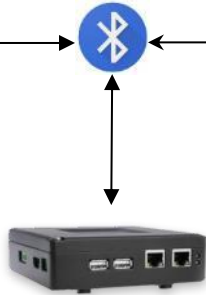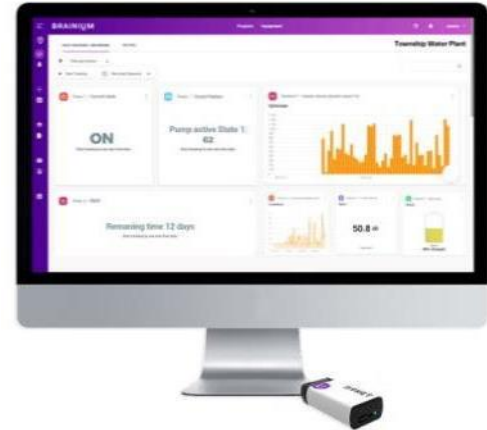
MOTOR

PUMP

AGILE Device #1
PdM Mode

AGILE Device #2
PdM Mode

POWERED BY
Raspberry Pi

Brainium Gateway
Application
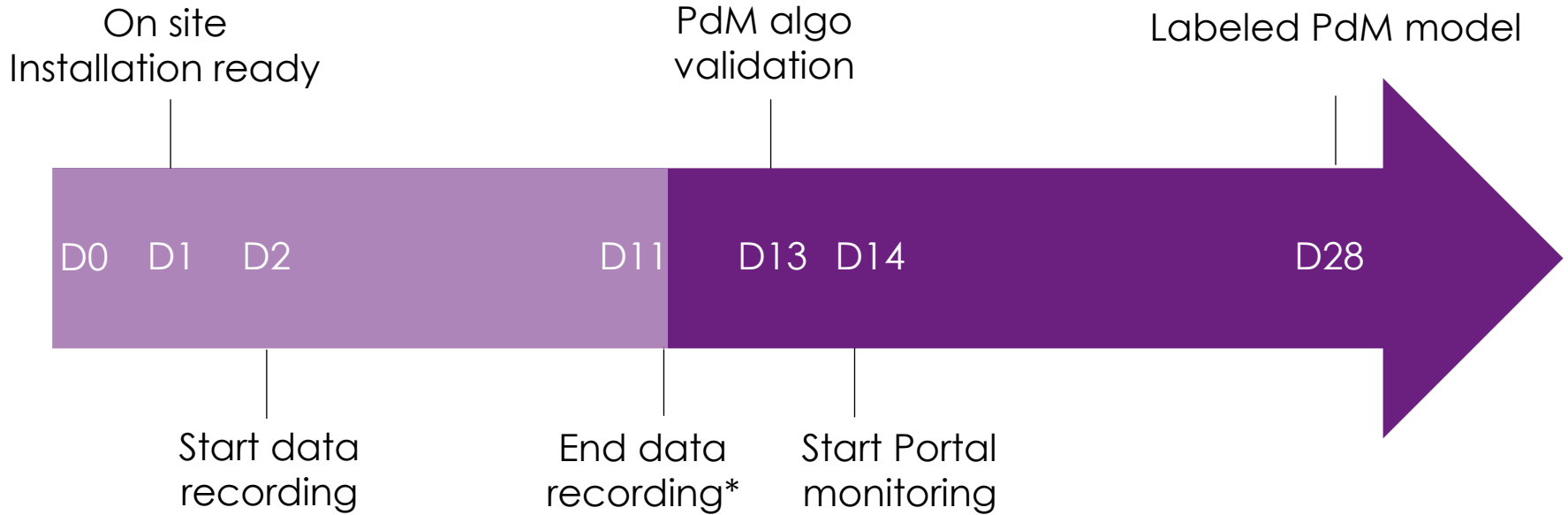
Wifi (TCP IP) connection to Portal

CUSTOMER DATA ON BRAINIUM PORTAL

POC TIMELINE

Pumps become Intelligent in just a few days:

On site Installation ready

PdM algo validation

Labeled PdM model

D0 D1 D2 D11 D13 D14 D28

Start data recording

End data recording*

Start Portal monitoring

Data recording period is optional: Pdm model can run without data recording

NEXT STEPS AFTER POC

- Apply POC to other pump station configurations

- Replicate POC to a further 18 other pump stations

- Define full Project specifications with Customer

- Agree full project scope and deliverables

- Deliver custom managed service to customer

- Roll-out pilot on 10k pumps in Eastern Europe

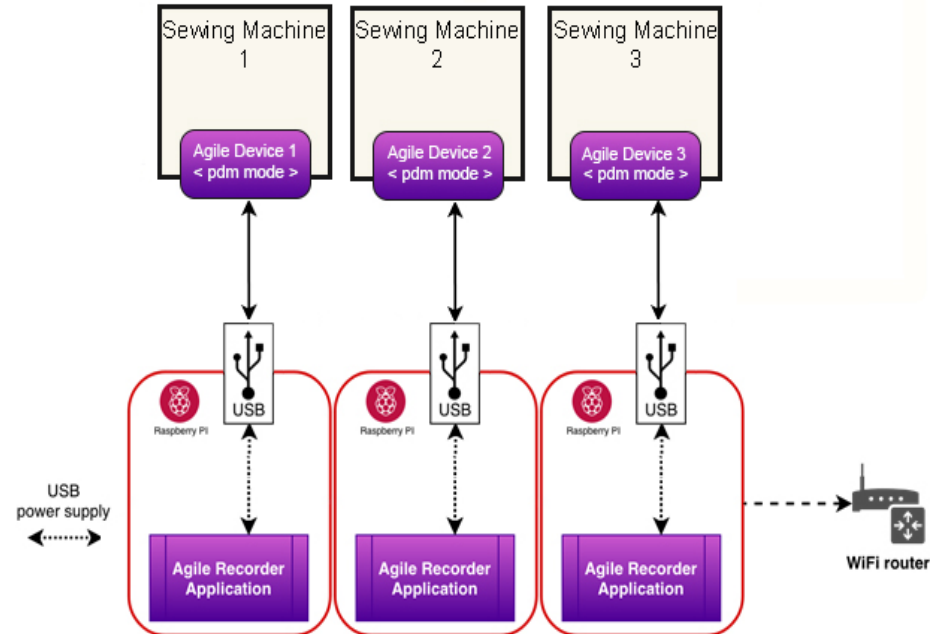# CUSTOMER USE CASE #2

Activities detection on sewing machines

POC SCOPE: SW CUSTOMIZATION

- **Objectives**:
  - Custom AI model creation on Sewing machines,
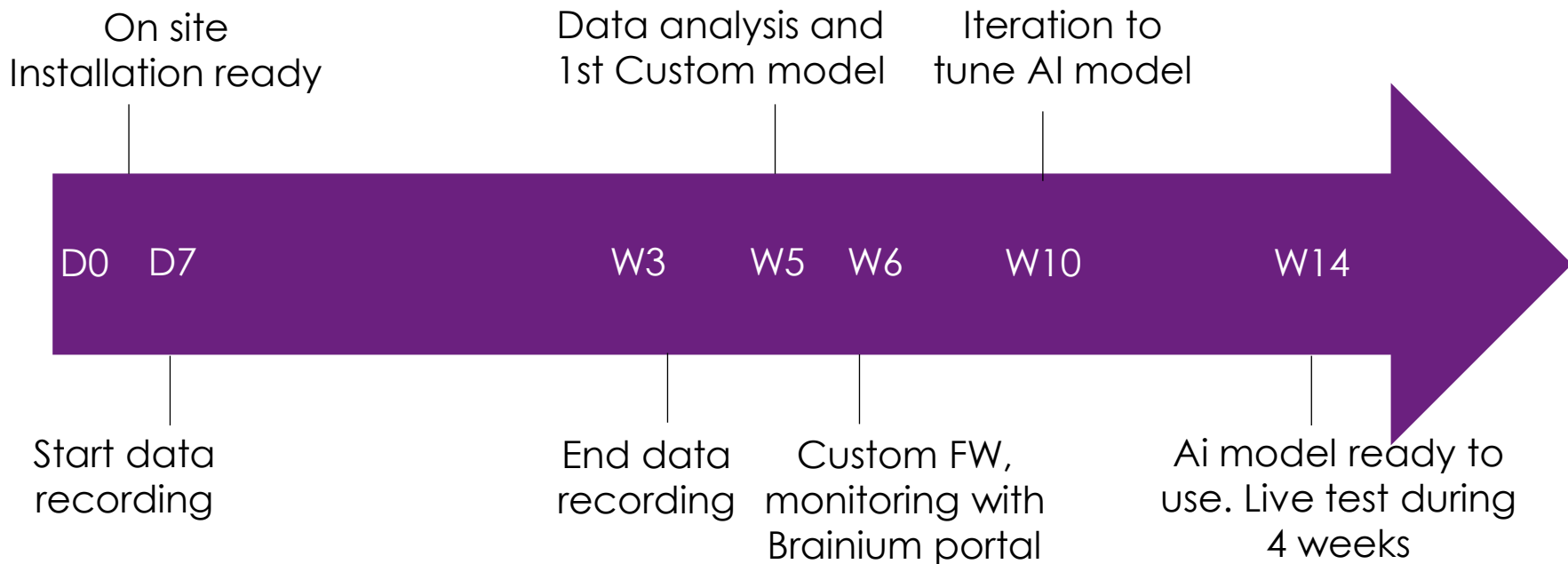 - Detect Activity duration and count of stiches for each machine
- **POC set up:**
  - Equip 3 sewing machines with one SmartEdge Agile on each,
  - Specific dashboard will be developed by the SW integrator using Brainium Portal APIs

POC TIMELINE

Sewing machines become Intelligent in just a few days:

On site
Installation ready

Data analysis and
1st Custom model

Iteration to
tune AI model

D0   D7   W3   W5   W6   W10   W14

Start data
recording

End data
recording

Custom FW,
monitoring with
Brainium portal

Ai model ready to
use. Live test during
4 weeks

CUSTOMER USE CASE #3

Predictive maintenance on motors

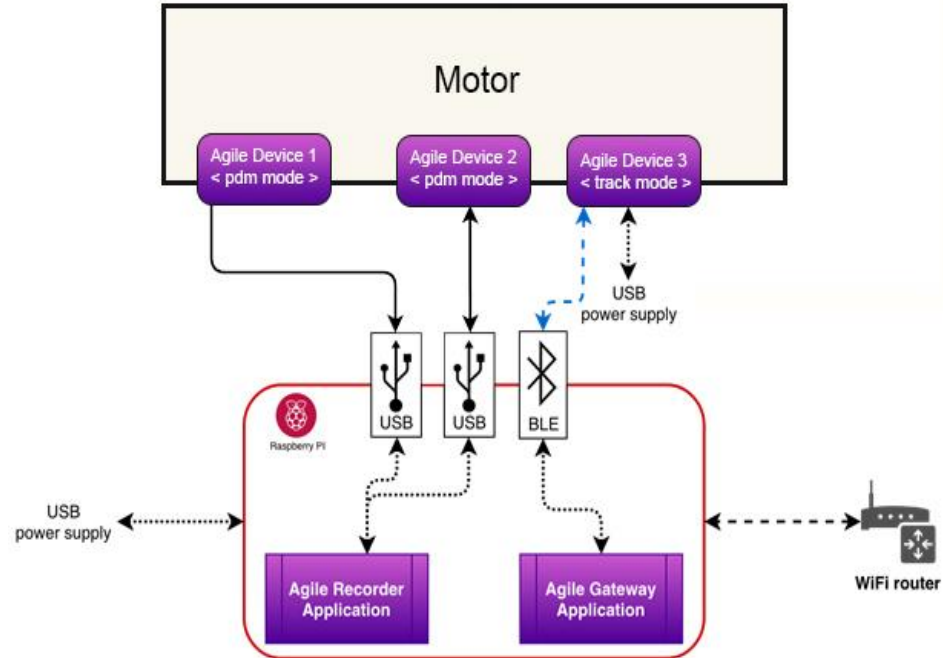**BRAINIUM**
Intelligence in a real world

POC SCOPE

- **Objectives**:
  - PdM model creation and Live data display in Brainium Portal,
  - Educate Top management about Predictive Maintenance with AI at the Edge
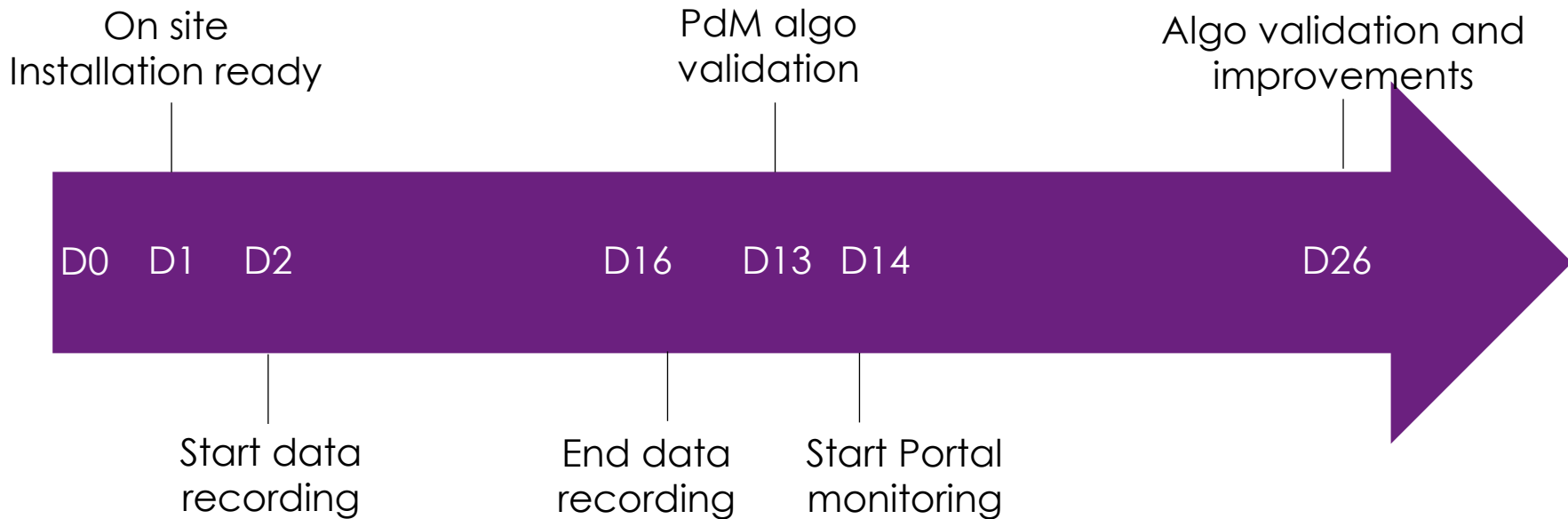- **Set up**:
  - Equip 5 different motors from the Show Room with 3 smartEdge Agile on each,
  - 2 devices for Pdm model, 1 device for Live tracking

POC TIMELINE

Motors become Intelligent in just a few days:

CUSTOMER USE CASE #4

Motion recognition on e-cigarettes

BRAINIUM
Intelligence in a real world

POC SCOPE: HW + SW CUSTOMIZATION
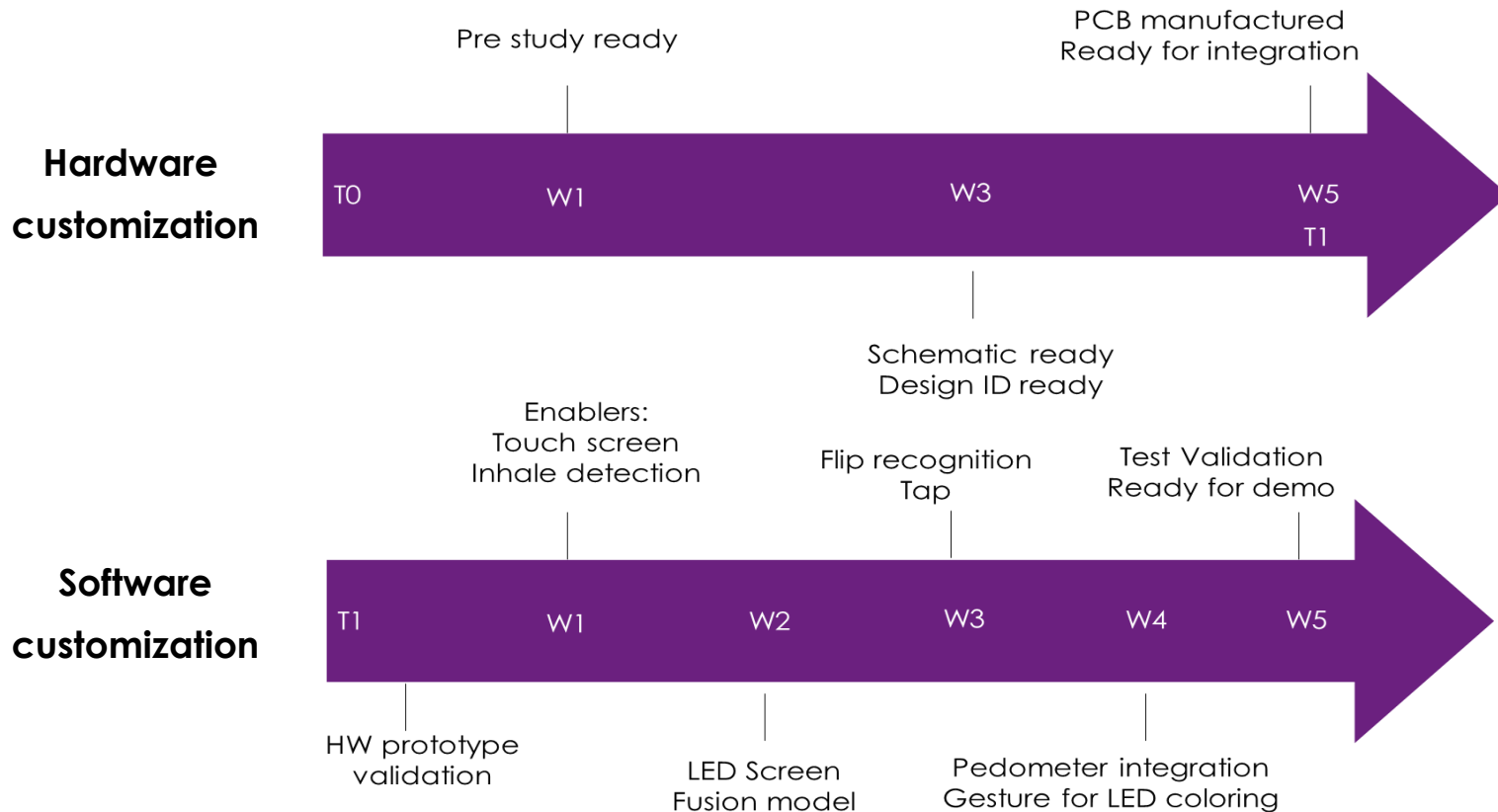
- **Objectives**:
  - Enhance vaping experience with intelligent features
  - Demonstrate a first POC with WOW effect to Top management
- **Set up**:
  - Use the BRAIN module with other HW customization
  - Investigate on different type of features/ motions:
    - Gesture recognition
    - Capsules recognition
    - Insights on users smoking habits …

POC TIMELINE

E-cigarettes become Intelligent in just a few weeks:

Hardware customization

Pre study ready

PCB manufactured
Ready for integration

T0　　　W1　　　　　　W3　　　　　　W5
T1

Schematic ready
Design ID ready

Software customization

Enablers:
Touch screen
Inhale detection

Flip recognition
Tap

Test Validation
Ready for demo

T1　　　W1　　　W2　　　W3　　　W4　　　W5

HW prototype
validation

LED Screen
Fusion model

Pedometer integration
Gesture for LED coloring

CUSTOMER USE CASE #5

Fall prevention on elderly people

BRAINIUM

Intelligence in a real world

POC SCOPE: SW CUSTOMIZATION

- **Objectives**:

    - Analyze elderly people risk of fall based on their health analysis,

    - Capture data coming from SmartEdge Agile and run a specific algorithm to create a report for the customer.
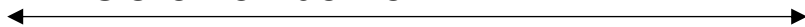
- **Set up**:

    - Equip each person with 4 SmartEdge Agile and capture sensors data during 10mn maximum

    - Use specific "Brainium recorder" application to capture raw data

POC TIMELINE

- FW available to download the data from Brainium Portal
- API available to upload the data from Octonion Server

W0   W4   W8

- Brainium Recorder application delivered
- Capability to record up to 4 devices simultaneously
- FW at 100Hz

CUSTOMER USE CASE#6

Activity detection on Horses
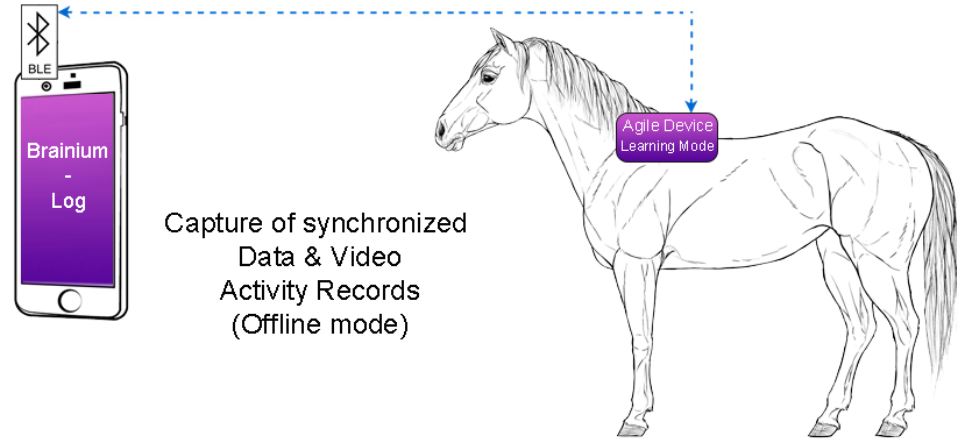
BRAINIUM
Intelligence in a real world

POC SCOPE: SW CUSTOMIZATION

- **Objectives**:
  - Analyze steps count, Temperature and Humidity with Agile device in a pouch on Horse rug,
  - Data recording in BLE, data monitoring in NB-IoT

- **Set up**:
  - 1 Agile on the horse and Brainium Recorder app to record data and video,
  - Data uploaded every 15mn for each horse

Capture of synchronized Data & Video Activity Records (Offline mode)

CUSTOMER USE CASE#7

Activity detection on Cows

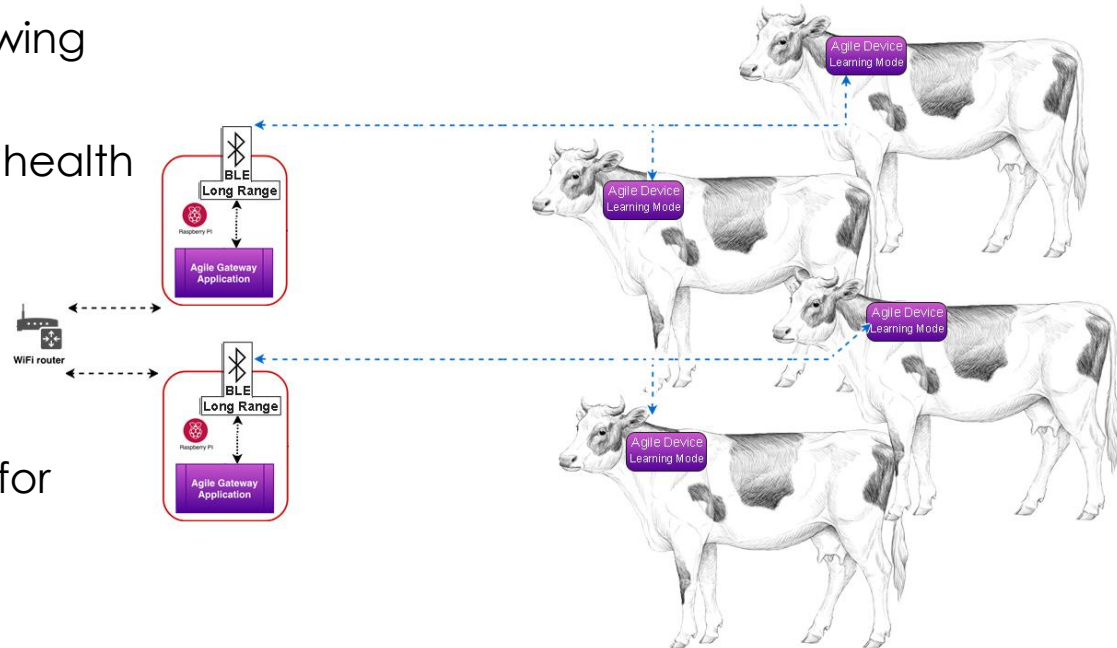

BRAINIUM
Intelligence in a real world

POC SCOPE: SW CUSTOMIZATION

- **Objectives**:

  - Analyze cows patterns : Standing, Laying, Eating, Ruminating, Walking, Chewing count and Idle.

  - Provide insights on fertility, health and herd behaviour

- **Set up**:

  - 1 Agile on each cow connected to a gateway for data recording,

CUSTOMER USE CASE #8

Motion recognition on Worker

BRAINIUM

Intelligence in a real world

POC SCOPE: HW + SW CUSTOMIZATION

- **Objectives**:

  - Back injuries is one of the major issue faced by workers,

  - Objective is to detect bad bending and instantly warn the worker of its back position, helping him to correct it immediately

- **Set up**:

  - 1 Agile on each worker to record data for good bending and bad bending

  - Hardware customization to integrate vibration mechanism

Brainium Portal