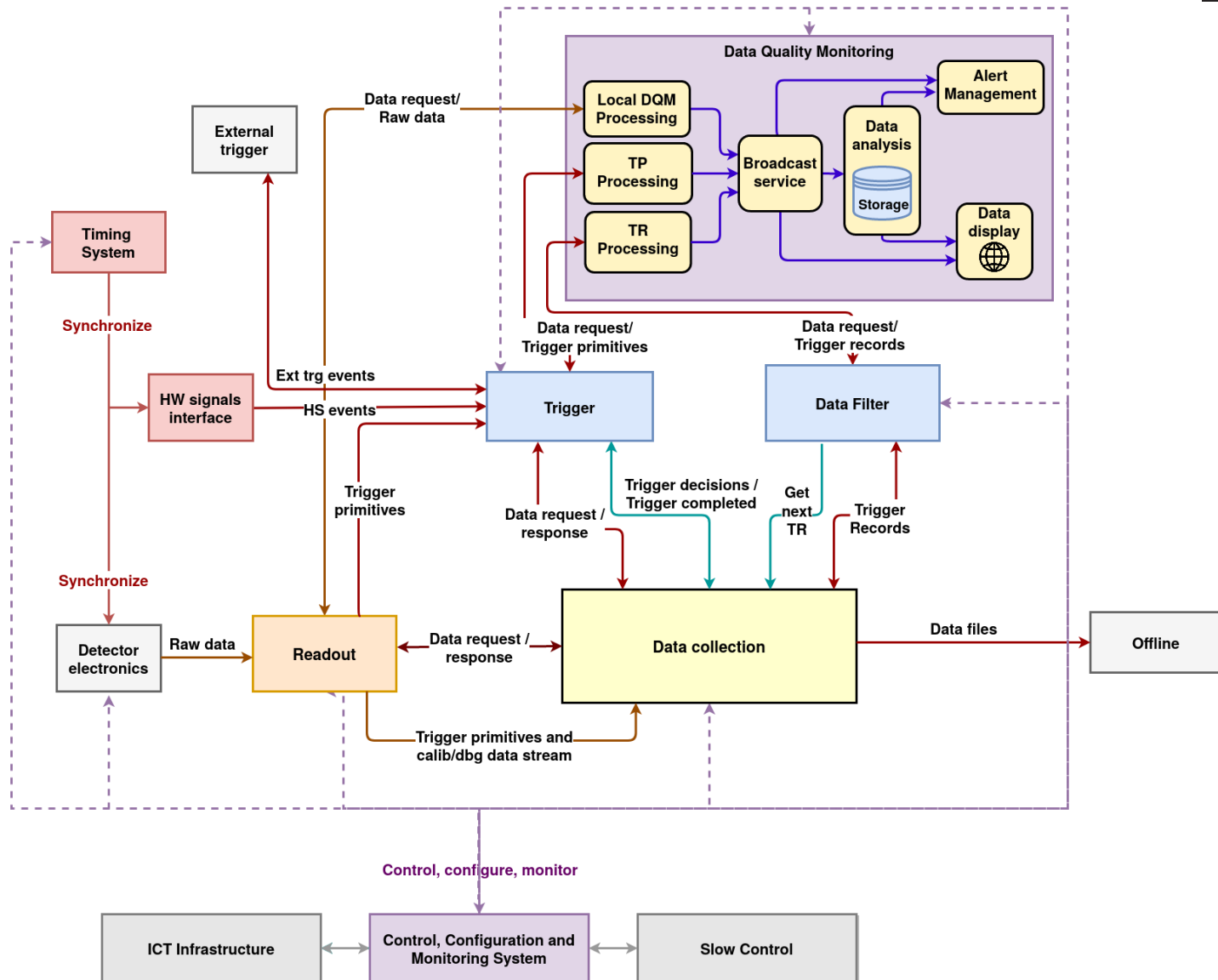# Data Quality Monitoring (DQM) Overview

Introduction & Scope

The role of the DQM system is:

- Live **sampling** of the data from all detectors.

- **Automated analysis** of the sampled data, and generation of **alerts** when quality degrades.

- Visualisation of the data quality for operators through a **web-based UI**.

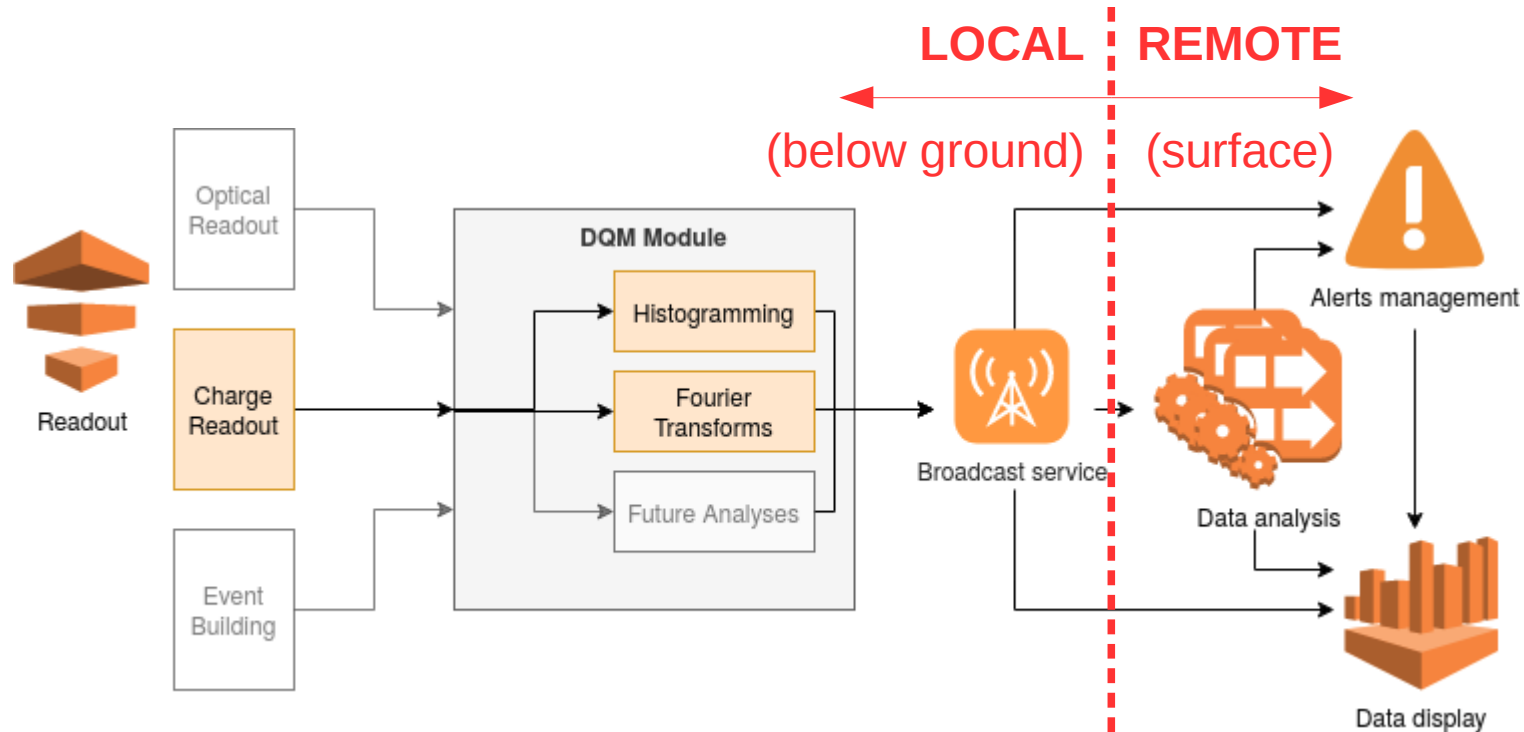- **Archiving** of data quality results for past run periods.
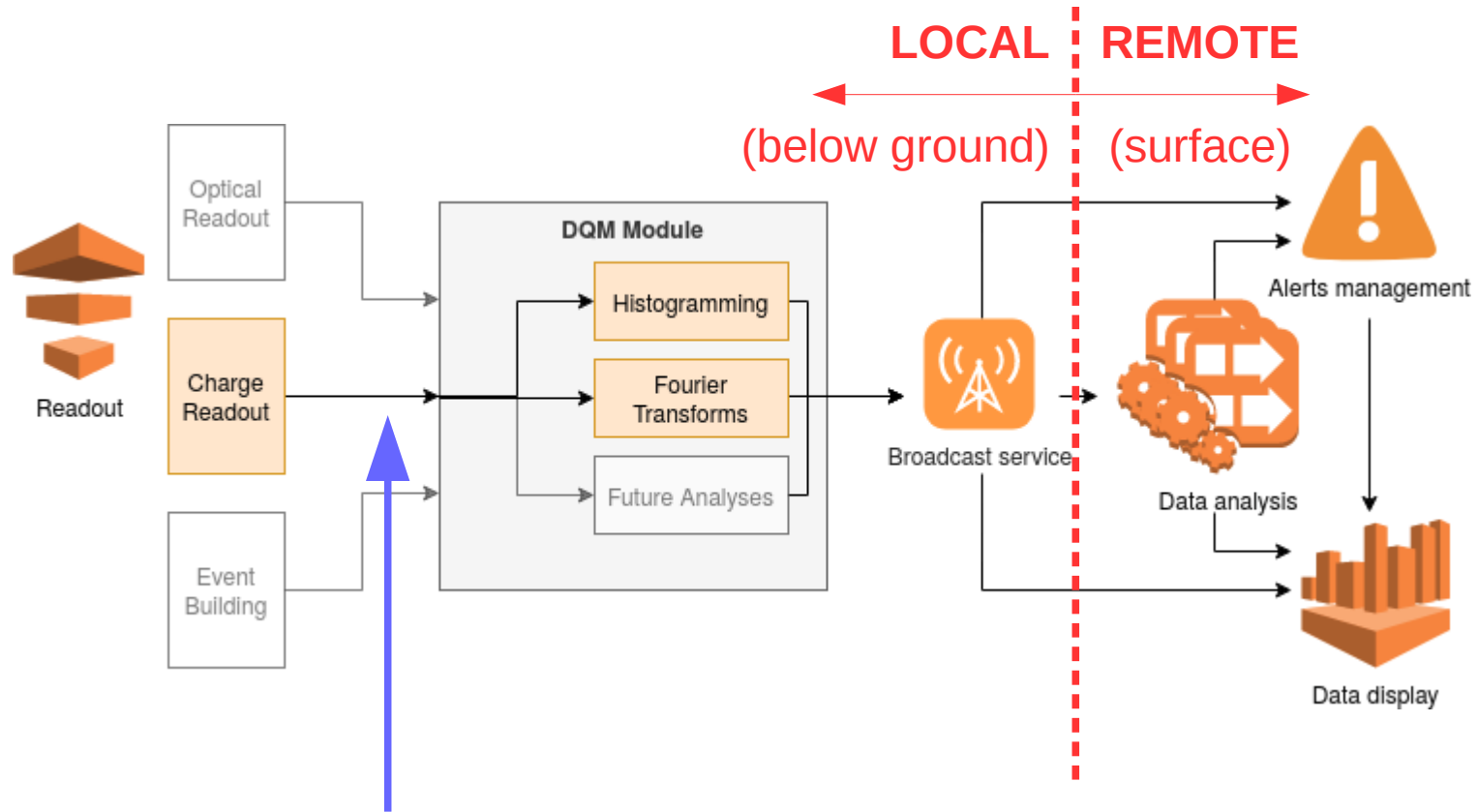
Interfaces

System Overview

System Overview

LOCAL | **REMOTE**

(below ground) | (surface)
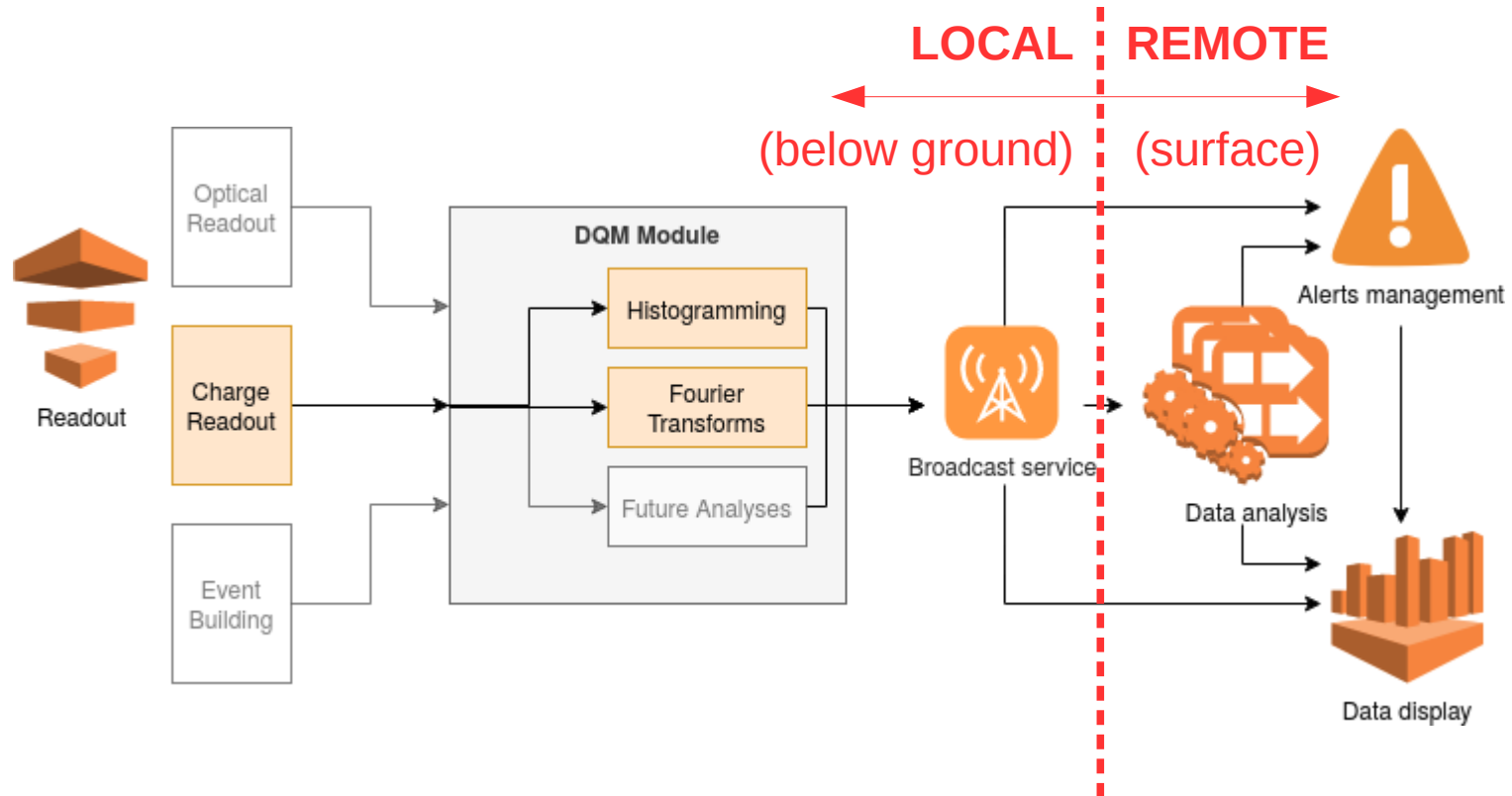
- **Resource-constrained (1 core per APA)**
- **Minimal dependencies, basic computation.**
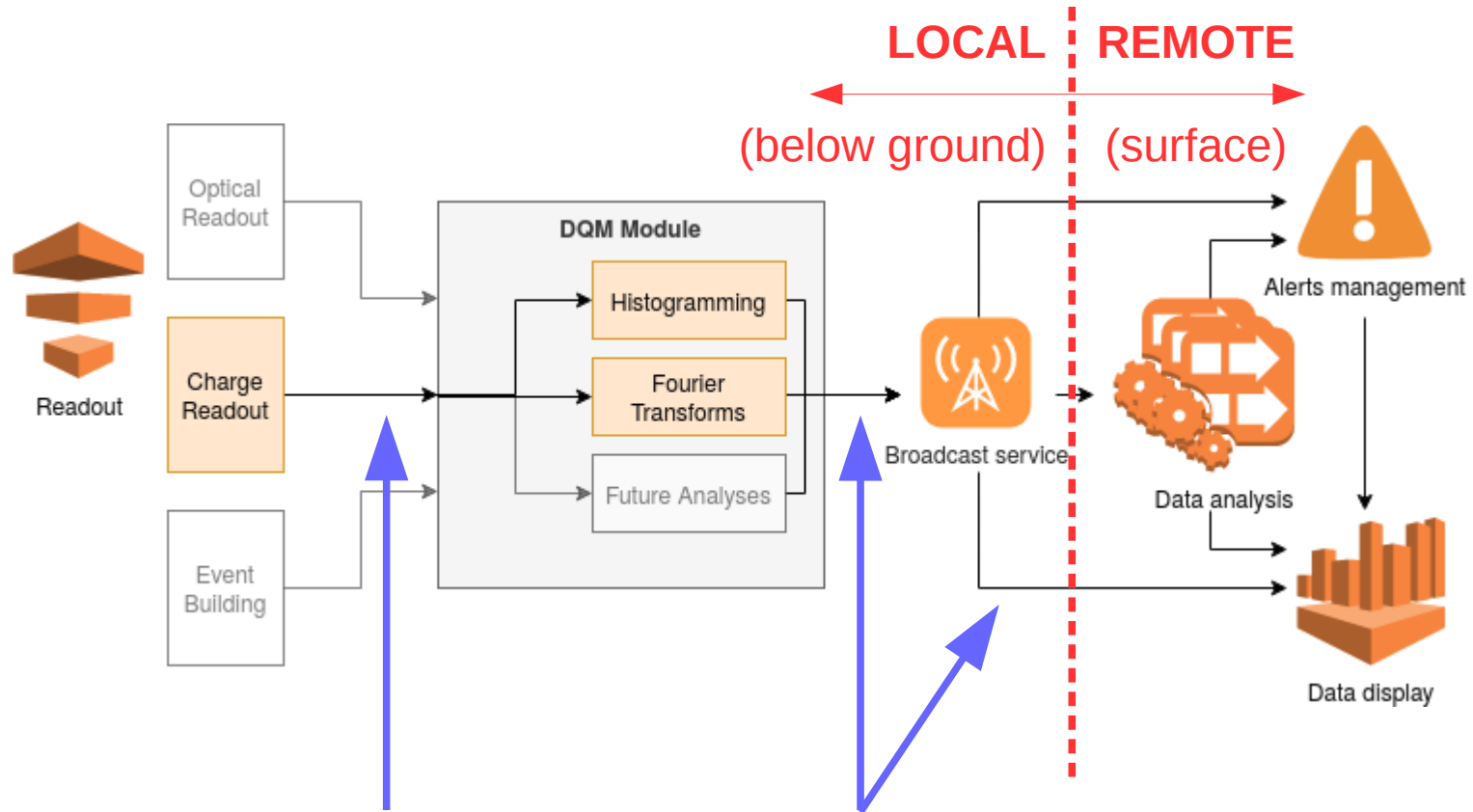- **Running within the DAQ app fwk**

- **Running on its own server.**
- **Advanced capabilities (e.g. machine learning).**
- **Outputs interface to CCM and web.**

System Overview

Native format data
e.g. raw data,
        trigger primitives,
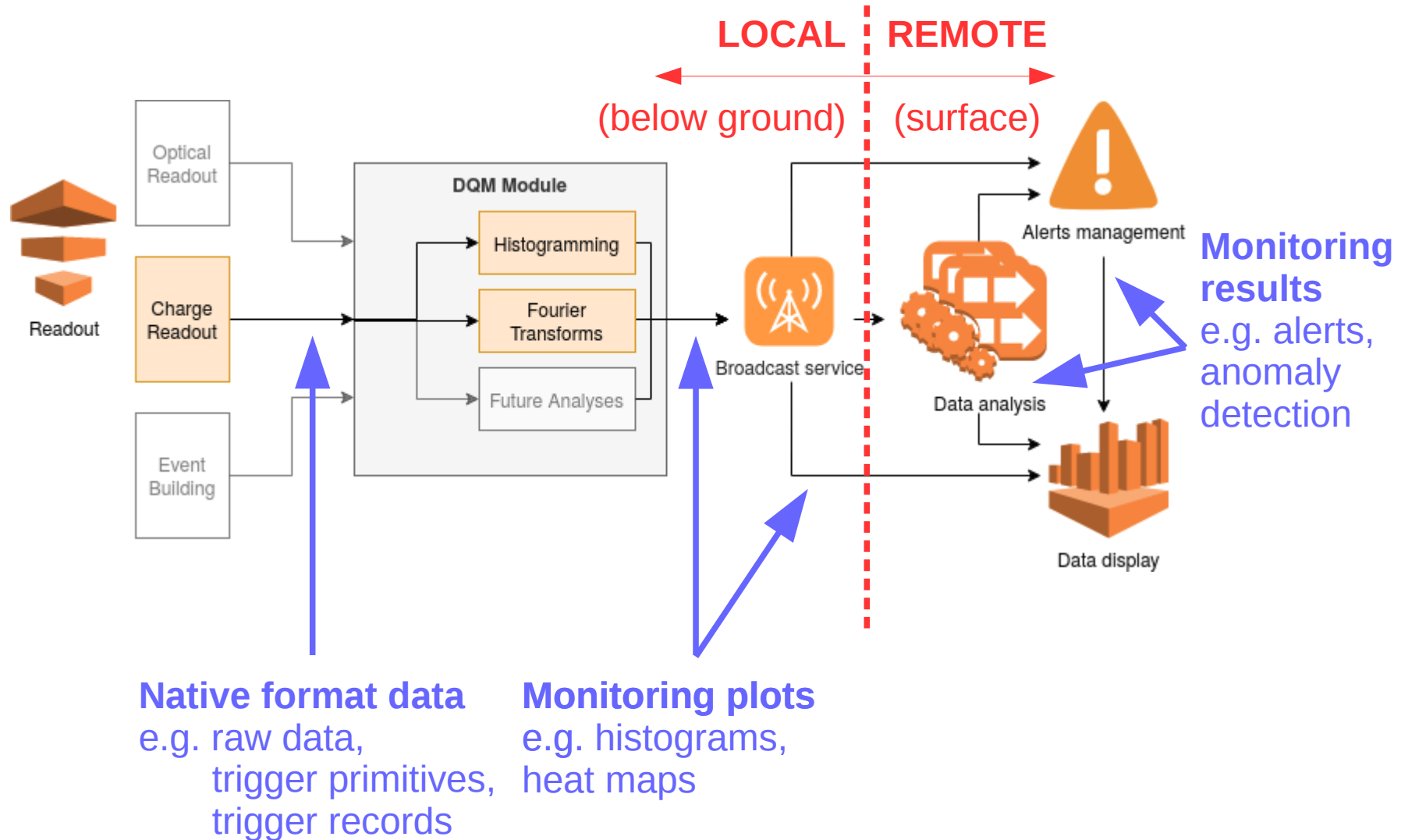   trigger records

System Overview

LOCAL | REMOTE

(below ground) | (surface)

Native format data
e.g. raw data,
    trigger primitives,
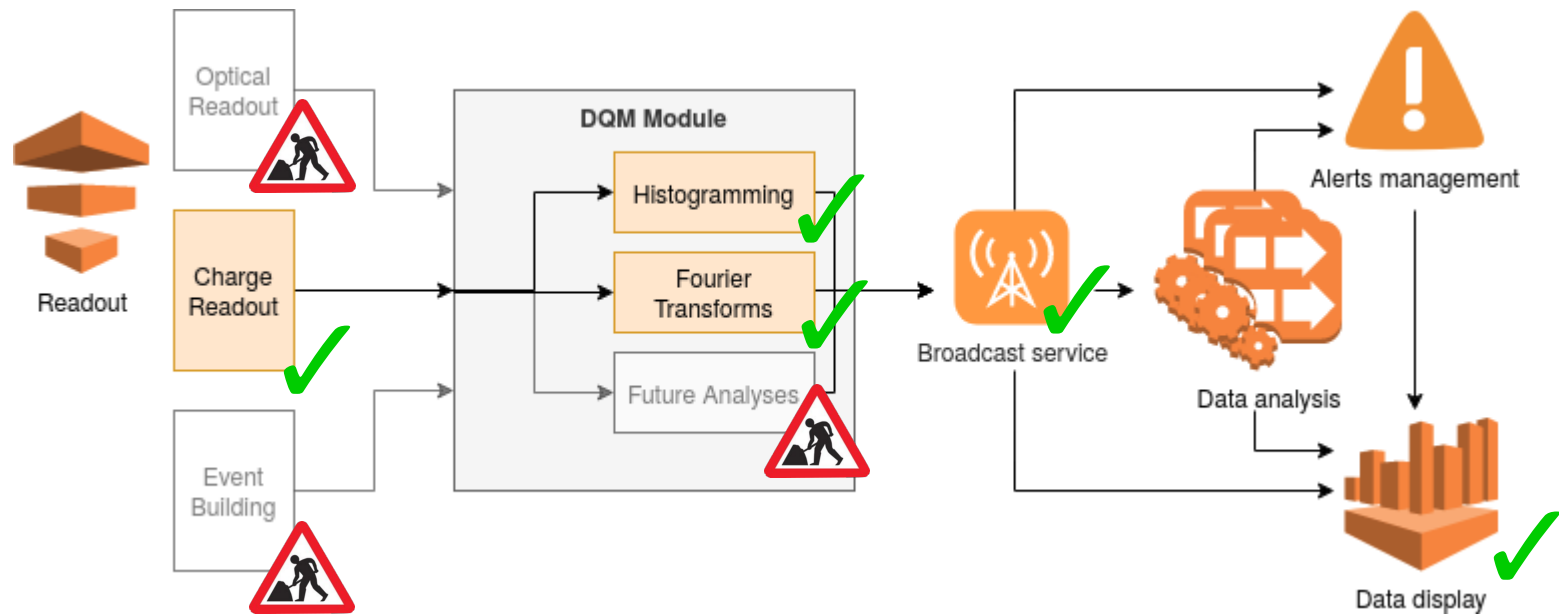   trigger records

Monitoring plots
e.g. histograms,
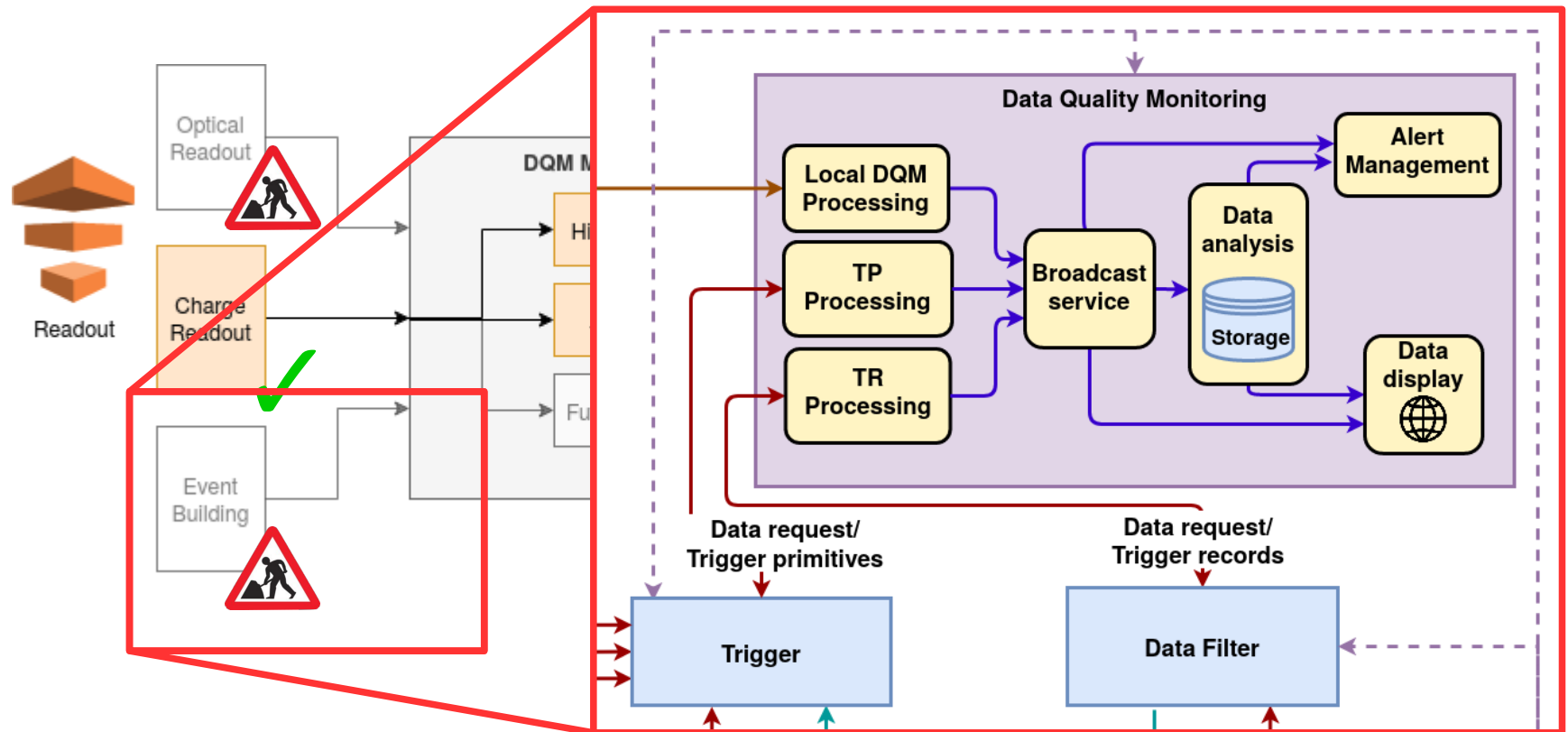heat maps

System Overview

Current System Status

We currently have a path through the system for charge information, from readout to the web UI.

Current System Status

- If the filter has analysis it's already done we can pass that straight through to the broadcast.
- If the filter wants to tell the DQM when it has interesting data, we may need a new style of interface.

Current Monitoring Suite

Our web UI currently displays 4 types of plot (each with 1 plot per plane).

- Raw event display

- ADC Mean & RMS

- Fourier transform

- ADC histogram per channel

https://dune-dqm.app.cern.ch/
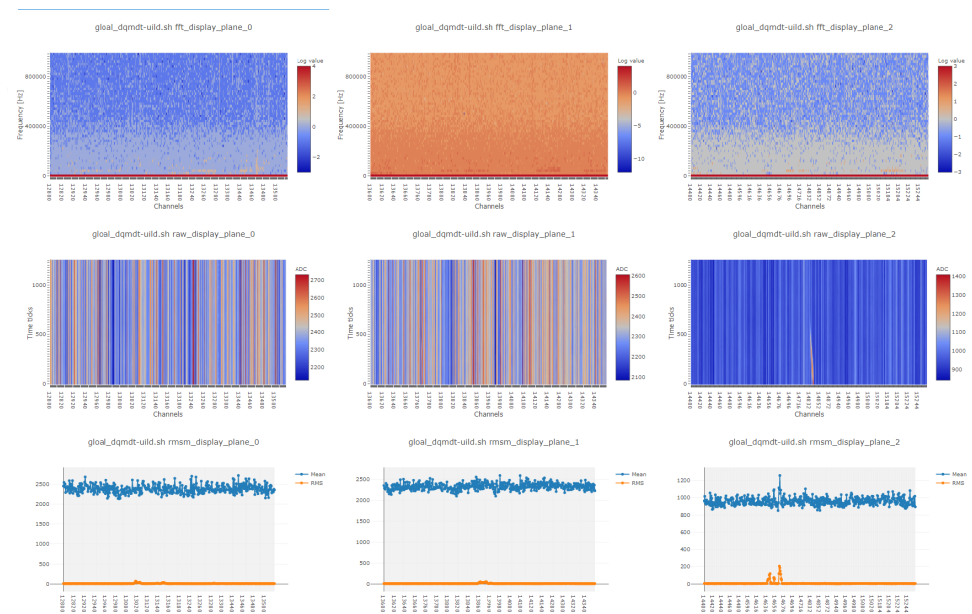
Suggestions/requests very welcome, but may not be implemented immediately – these plots are what will go live for the cold box.

Interface to Data Selection

- Each different input is monitoring the quality of data at that point in the data flow.

- For storage and processing purposes, we don't want to duplicate plots. Our plots need to ask questions germane to the stage of the dataflow they're coming from.

- What parameters summarise the performance of the data selection?
    - Monitoring plots

- What parameters are of interest for advanced analysis?
    - Monitoring results