

Performance indicator calculation based on State & Event processing

WindEurope 2022, Bilbao

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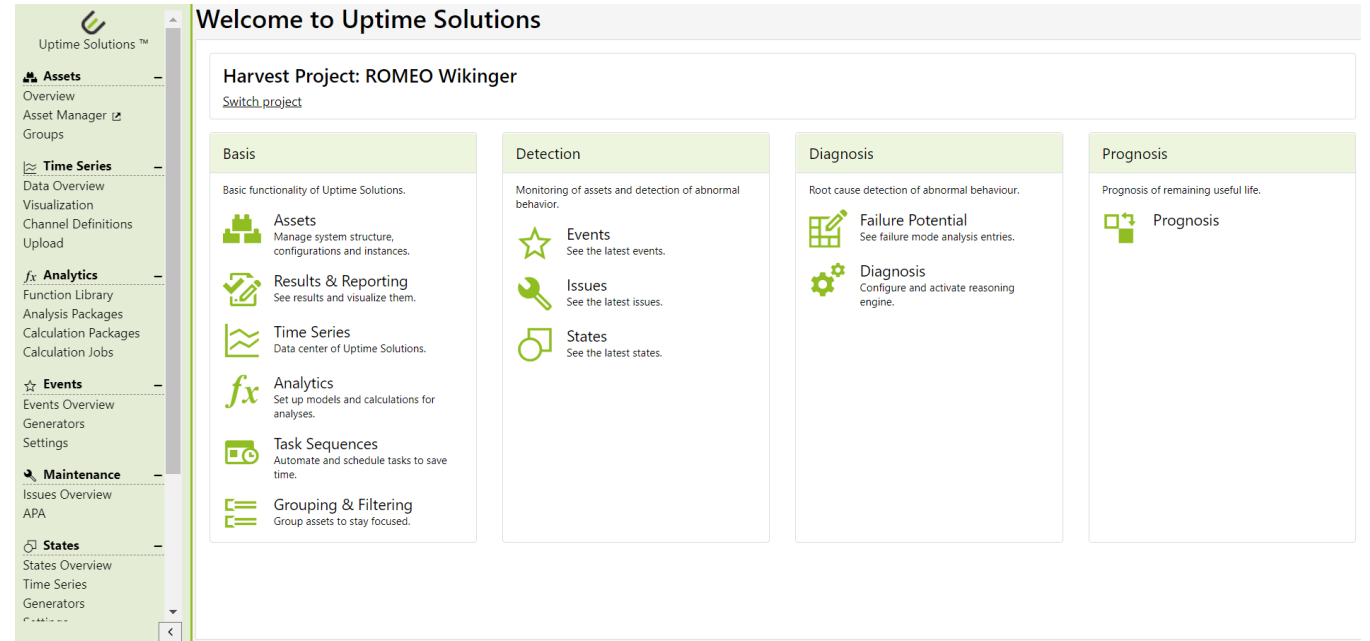
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 745625.



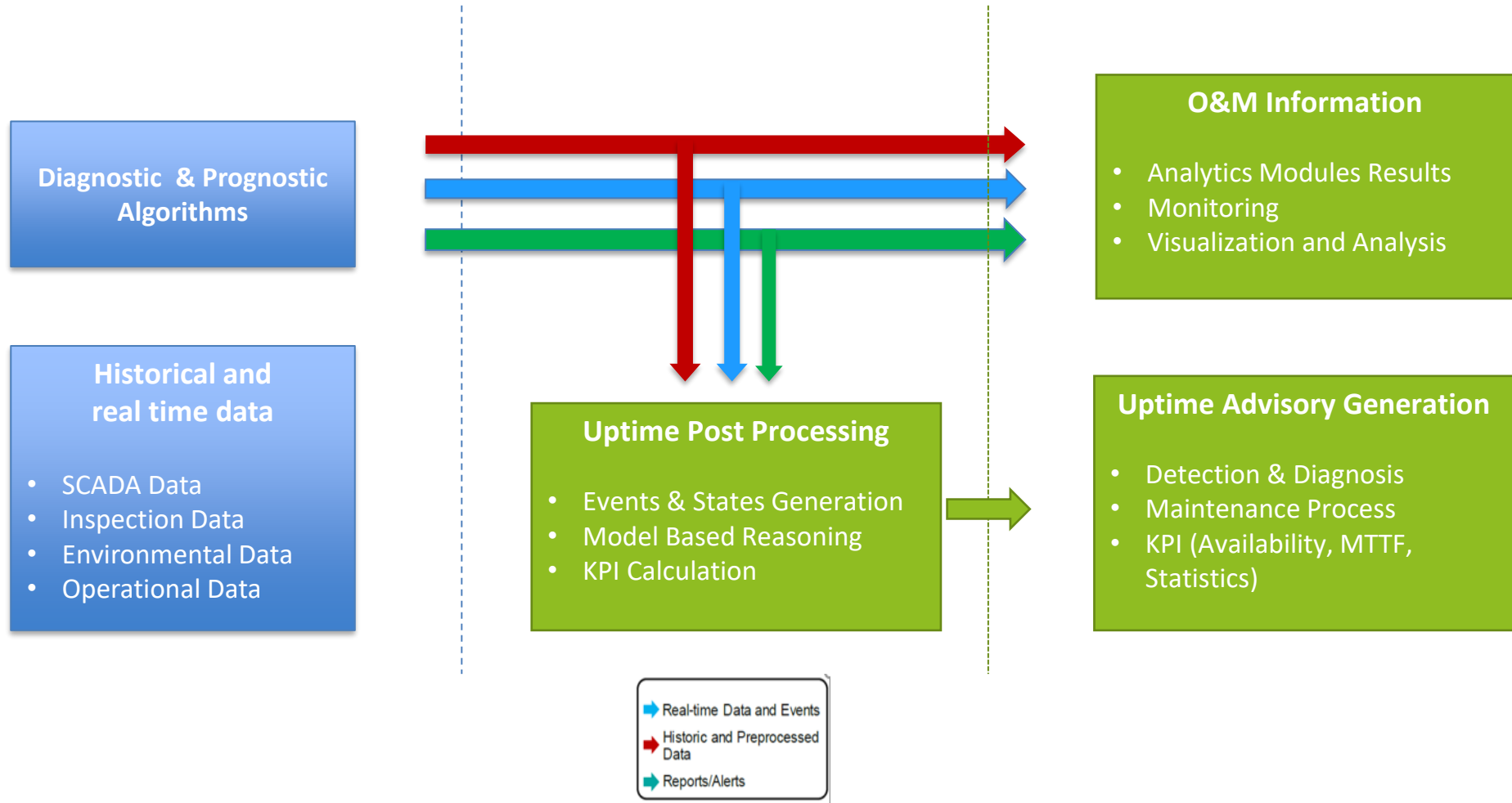
WP6 Objectives

The aim of this work package is to develop, deploy and demonstrate a fully operational **information management platform**. This platform will be designed for direct contribution to optimization of operation and maintenance program.

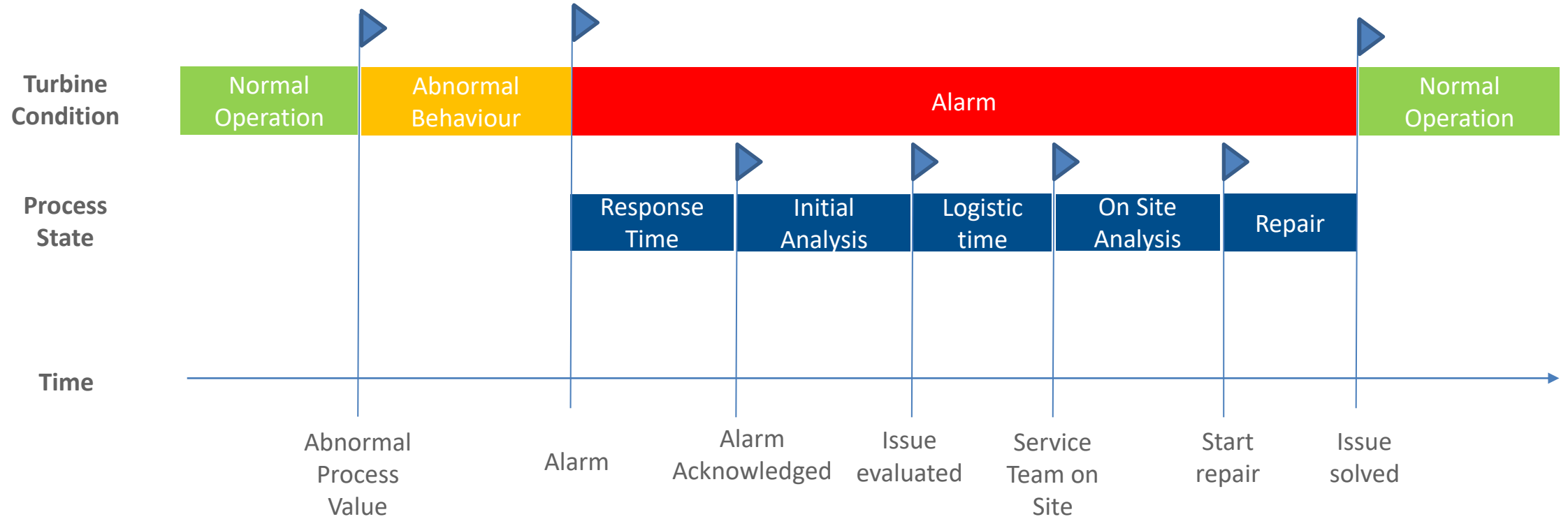
- Integration of heterogenous data and information
- Visualization tools for analysis
- Analytics functionalities for KPI calculations and analysis
- Automated advisory generation functionalities



ROMEEO – The Use Case



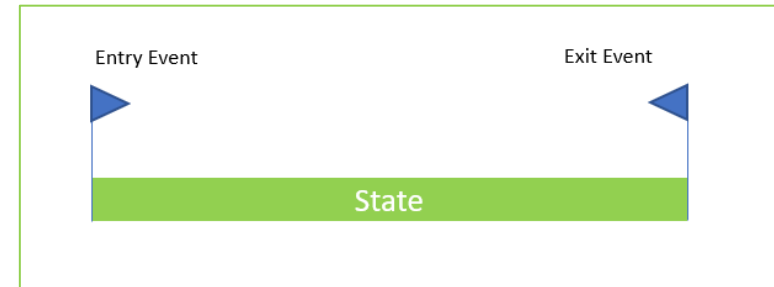
State & Event Processing



State & Event Processing

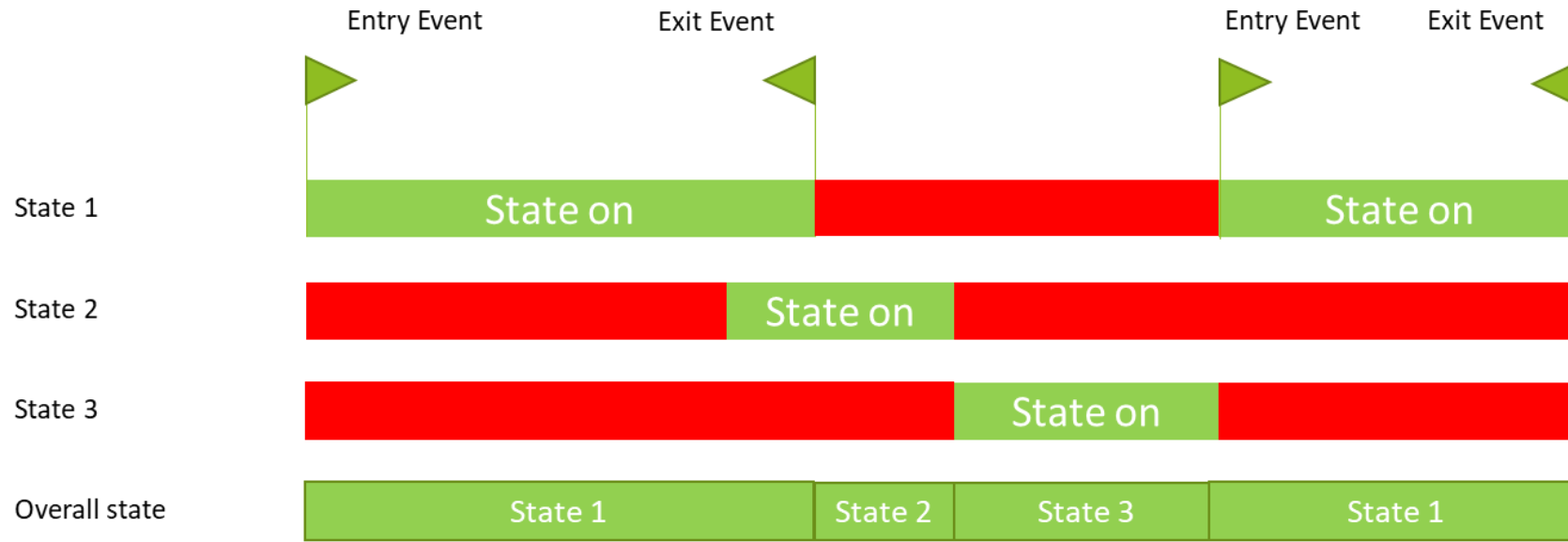
- One coding system for all States & Events
- Events originate from various sources
 - from the SCADA system and
 - from analytics of time series
 - from on-site inspection, etc.
- The State hierarchy is defined
 - to determines priority levels
 - to derived a system-State from subsystem-States
- Events & States time series are generated for
 - statistics and weak-point analysis
 - notification service, etc.

- A **State** is the condition of a system or component or process within a timespan



- An **Event** is an occurrence at a point in time
- Changes of States are determined by Events

State & Event Processing



- Several states can exist independent from each other on different system levels
- States can overlap each other
- The overall system state can be derived using priorities

State & Event Processing



- *State Scheme* defines all attributes for states
- *State Catalogue* contains all states available in the project

State Scheme

State Code	Description	Entry Event	Exit Event	Availability Category
01	Normal Operation	01	03;04;08; 10; 15;...	Available
02	Stopped	02	01	Unavailable
03	Temperature Alarm, stopped	03	01	Unavailable

} *State Catalogue*

States & Events – Use Cases

Information

- Current and historic states
- of systems and subsystems and processes
- Events, indicating deviations from normal behaviour

Downtime Categorization

- Downtime assignment to states
- State entry and exit via events
- Assignment of downtimes to categories

Availability

- Assign availability categories to states
- State entry and exit via events
- Assign times to availability categories

Event Statistics

- Occurrence of particular events
- Key metrics (distribution, sequence, cluster)
- Abnormalities & indicators

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