

OPC DAY
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Future of Industrial OPC UA

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Future of Industrial OPC UA

Current state of customer use cases:

- OPC UA Servers:
 - Connect data to cloud
 - Integrate multi vendor systems
- OPC UA Clients:
 - Connect multi vendor systems
- Server / client balance:
 - => 1/3 servers, 2/3 clients
- Data-models:
 - Just basic data types mainly used



Steps to right direction

Small but important ones: wider use of existing features

- Data-models:
 - Some cases with DataItems (Definition, EngineeringRange, EngineeringUnits)
 - Devices with OPC Foundation data models: AutoID, PA-DIM etc.
- ERP/MES integrations
- OPC UA HA:
 - Synchronize missing (needed) data between mill historian & cloud analytics
- OPC A&C:
 - Events (alarms) to find out "problems" from time-series data



Data models

Companion specifications

- Rich meta data needed:
 - Device models
- Use cases:
 - Digital Twins
 - Condition monitoring



Event based systems

From static configuration to dynamic runtime behavior

- All current systems are made with static configuration:
 - Design is "static"
 - Data flow is "fixed"
- Dynamic runtime - event based configuration (example):
 - As pump starts => event
 - Enable historical data for "related" variables
 - Start collecting needed data for the analytics (5 min period) then stop "disable HA"
 - Run analytics (validate accuracy) – pump cavitation or anomaly
 - Store result
 - Kind of operative "Digital Twin" running just on demand

Cases: pump & level analytics

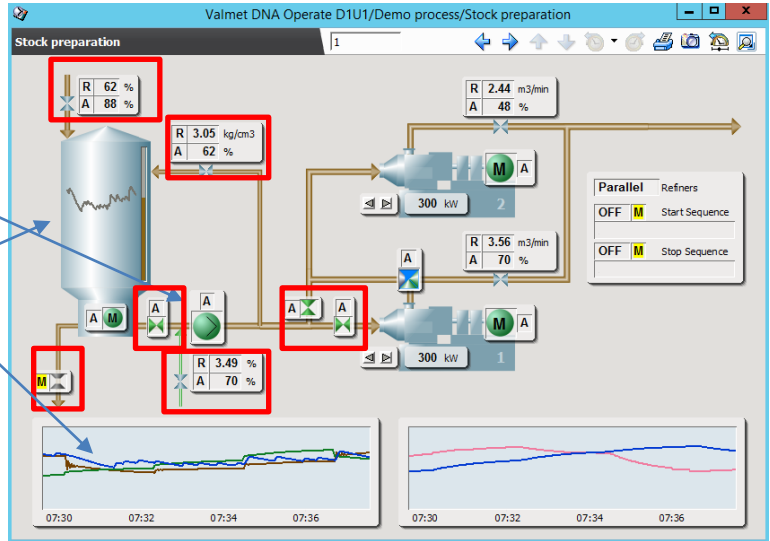
Detect pump anomaly & Forecasting tank level

Pump anomaly detector:

- Pump starts (event)
- Related variables HA data
- Train/run detector
- Store results

Level runtime predictor:

- Level measurement model
- Train/run predictor



What is needed? Why?

Justification for the future

- Disturbance related to event(s) on process
- Most of data flow not needed / used or used for long term analytics, training can be done with snapshots or collected on demand
- New challenge for server – client usage
 - Server methods needed for change runtime
 - Clients must be more “clever” => Intelligent automation
 - How to build – make “pre-configuration” like related variables, meta-programming
- Benefits (pros & cons):
 - Less resources used
 - On demand peak – not too much at same time – parallel / queue => orchestration

Summary

OPC UA building the future of digital industry

- Smart industry – small hybrid Digital Twins
- From smaller cases like pumps, measurements to hierarchies
- From hierarchies to systems
- Enterprise level intelligence – autonomous mills

Next level / generation - Intelligent automation

Bonus

ValmetXR & OPC UA – UI components with meta data from the data items – living Digital Twin

- 1) Browse address space
- 2) Drag & drop
- 3) Select animation



Tank: living level



Gauge: needle according range



State texts: TwoStateDiscrete, MultiStateDiscrete

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