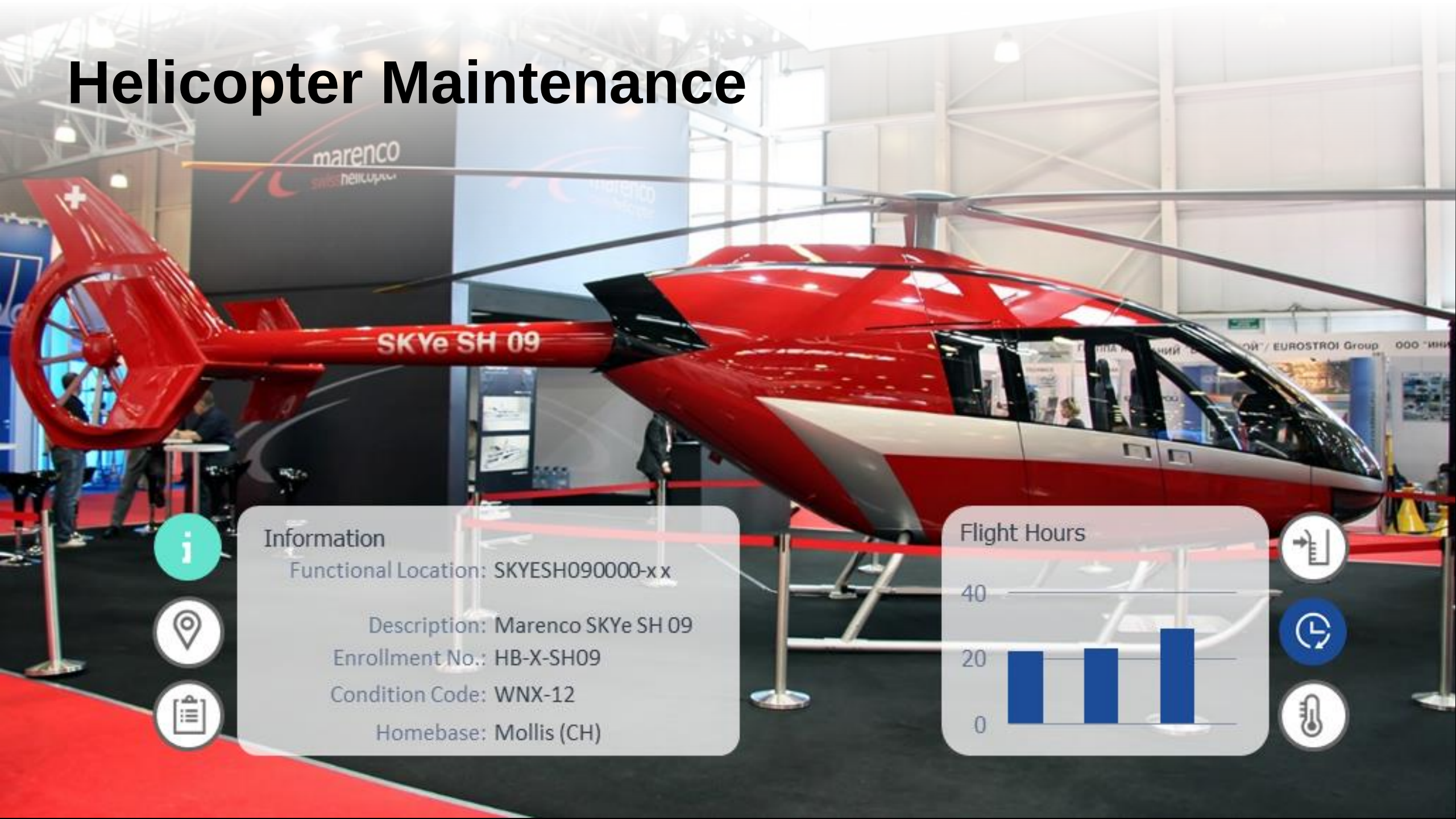
IoT Examples from around the world

Rudolf Held, Vice President, Global Head of SAP Co-Innovation Labs, SAP SE

Moscow, June 10, 2015

Public

Helicopter Maintenance



Marenco Helicopter Maintenance using Augmented Reality

SAP Co-Innovation Lab DACH

Supporting small helicopter operators with cloud-based mobile service for helicopter maintenance and support assuring legal requirements for documentation using Augmented Reality-enhanced 3D visualization elements.

Engaged partners

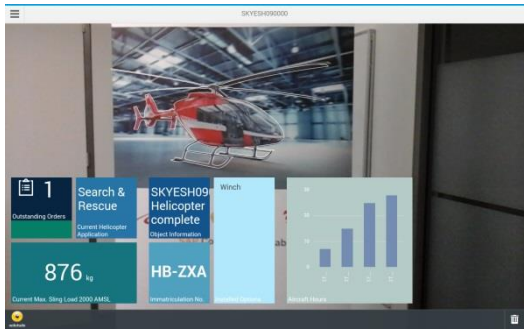
allvisual*

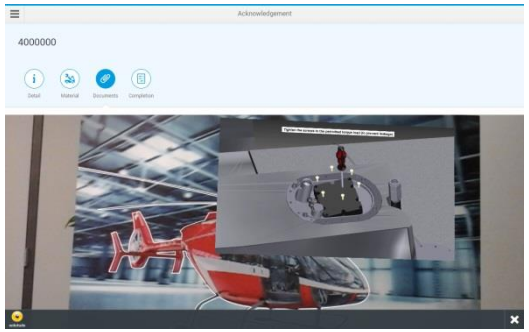
wikitude
See more.

ORIANDA

marenco
swisshelicopter

*formerly Marenco Swissconsulting





Background:

- Marenco Swisshelicopters is a new producer for a multi-purpose light single-engine helicopter
- End customers are often very small operators (1 helicopter, 1-2 staff) with paper driven maintenance processes and documentation. Legal requirements for maintenance documentation in the aviation industry are very strict.
- Idea: Provide cloud-based mobile service for helicopter maintenance and support assuring legal requirements for documentation using Augmented Reality-enhanced 3D visualization elements.
- Based on SAP's mobile platform, using Wikitude's AR technology.
- First prototype presented at various events such as SAP TechEd Berlin 2014

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SKYe SH09 – Marenco's helicopter

Roll-out of first prototype 22.11.2013

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SKYe SH09 – Marenco's helicopter

First flight of first prototype 02.10.2014

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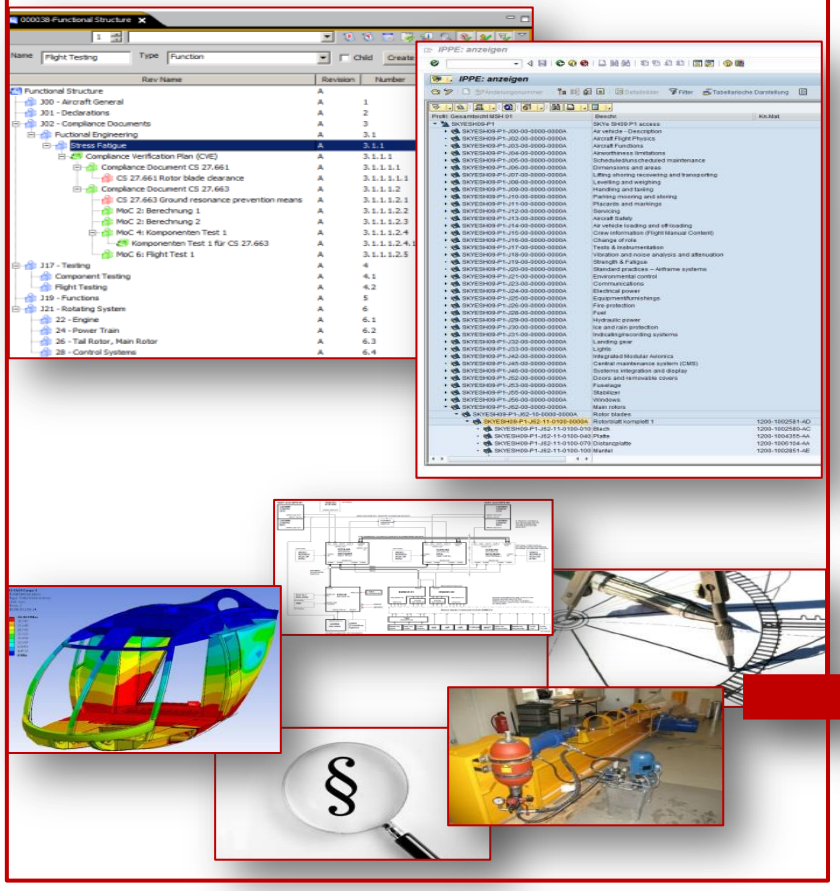
SKYe SH09 – Marenco's helicopter

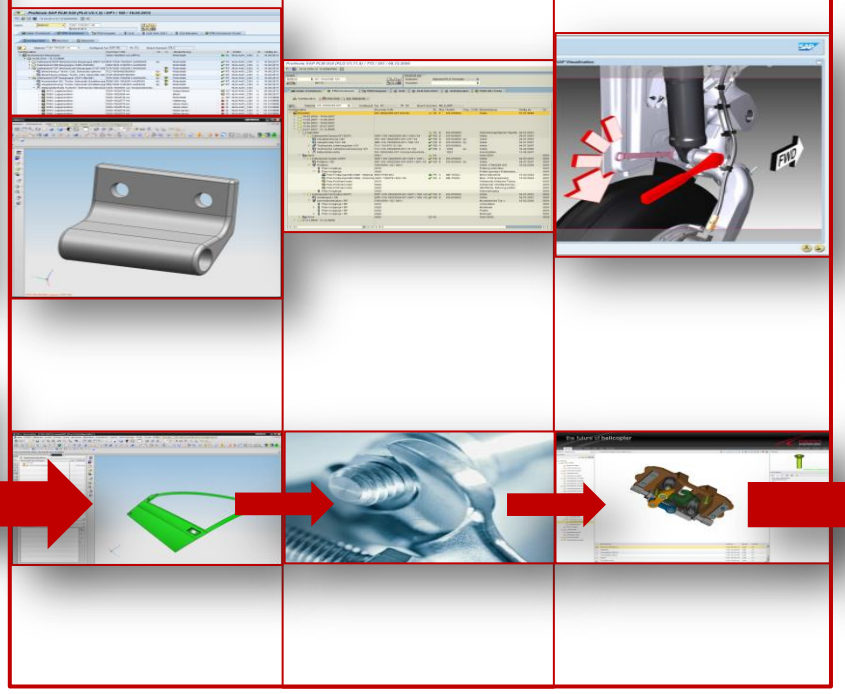
Product configuration management

Development Configuration



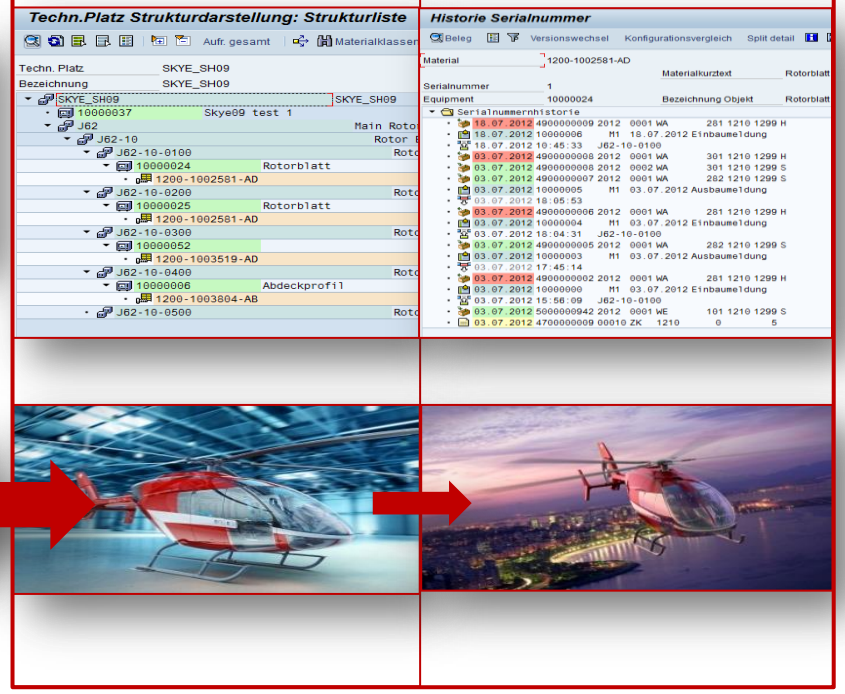
To-Be Configuration

Technical To-Be Config.	Supply Chain To-Be Config.	Customer Service To-Be Config.



As-Is Configuration

As-Built Configuration	As-Maintained Configuration



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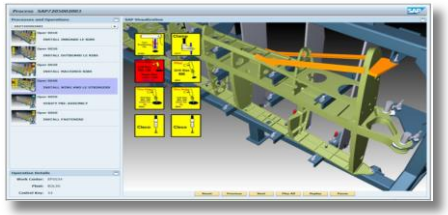
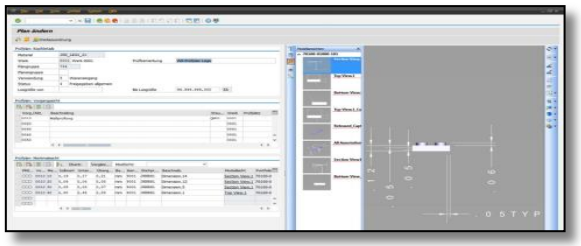
SAP Visual Enterprise as key to success

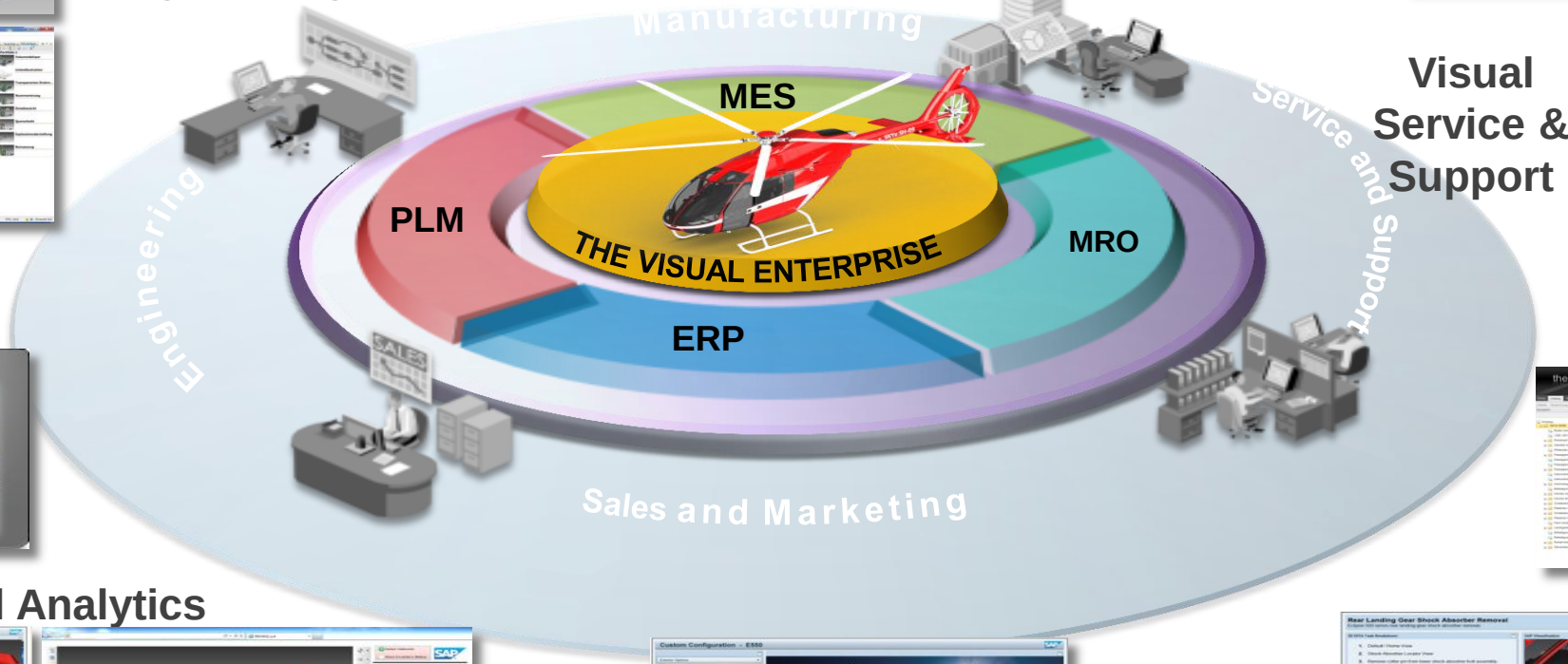
Visual Engineering

Visual Manufacturing

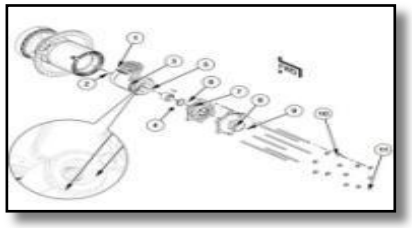


Visual Quality Management





Visual Service & Support



Visual Mobile Service

Visual Parts Catalog

Visual Analytics

Visual Marketing & Sales

Visual Mainte-nance

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SAP Visual Enterprise & Augmented Reality

A multitude of requirements for the operator

- Secured configuration management for the complete fleet.
- Retaining the pilot’s flight manual.
- Retaining the performance data for all aircrafts and special systems.
- Status code monitoring during operation
- Secure maintenance in all situations.
- Maintenance planning aligned with order situation.
- Flight planning and flight order planning.
- Continuous information readiness towards authorities.
- Consideration of human factors.

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Open Integrated Factory

Open Integrated Factory (OIF) at Hanover Fair 2015

SAP Co-Innovation Lab EMEA and SAP Manufacturing development

A Complete end-2-end Connected Plant / Industry 4.0 scenario with tangible products and manufacturing line showcasing with 6 partners together the highest flexibility in the production through resilient factory and lot size of ONE capabilities

FESTO

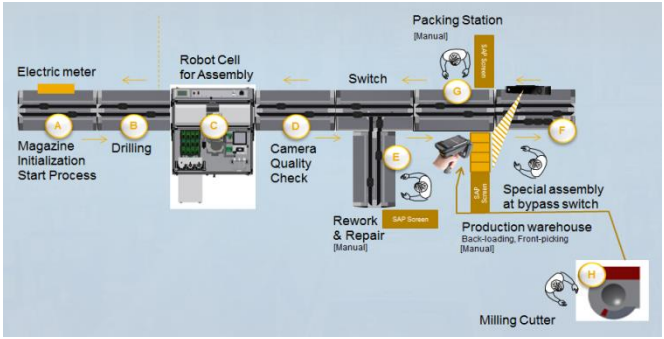
[SCIt] SALT SOLUTIONS

DSC Fascination with Integration

IGZ LOGISTICS + IT

TREBING + HIMSTEDT

SYSTEMA



Business Issues & Addressed Problems

- Seamless integration of machine with the control layer process using communication standards
- Configure, Price, Quote (CPQ), manufacture and deliver (engineering-) complex products
- Cloud-based Predictive Maintenance and Services on a real-world manufacturing line
- Energy monitoring and analytics in production

Customer & Business Value

Shop floor to Top floor integration without line / production cell servers. Means:

- No need for (costly) additional software layer
- Simplified processes without redundant master data maintenance and reduction of set-up times
- Optimized customer satisfaction with end2end configure, price, quote complex products delivery with higher flexibility regarding lot-size

Target Groups & Market Potential

- Solution is designed for all discrete manufacturing industries within most regions
- Showcased scenarios include both very automated steps e.g. robot, sensors and human-managed operations
- Can be used at industry machine components manufacturers as well as automotive, aerospace & defense and high tech suppliers

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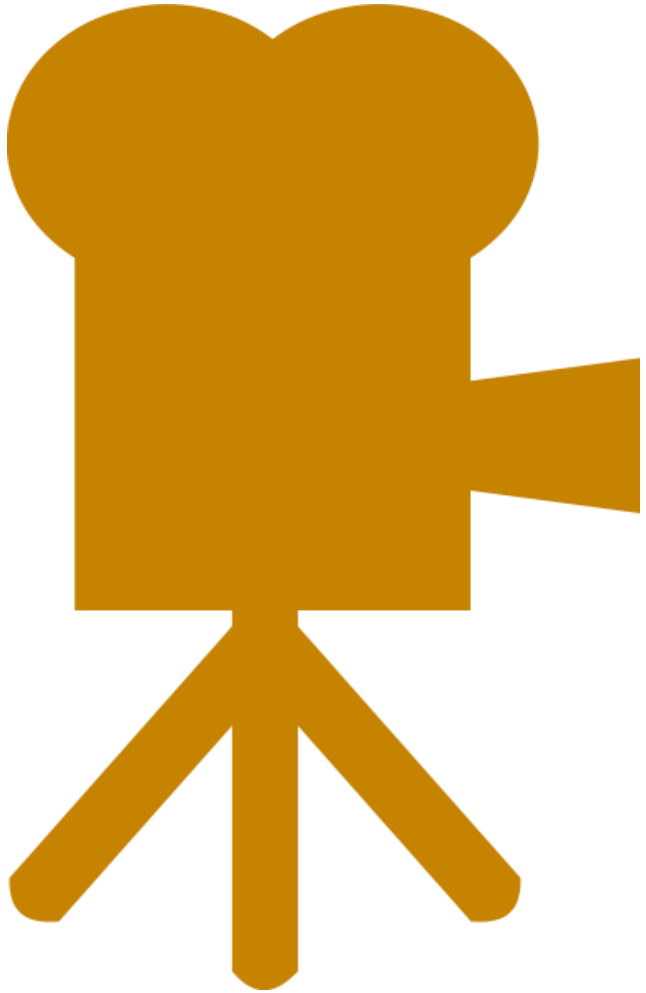
Movie



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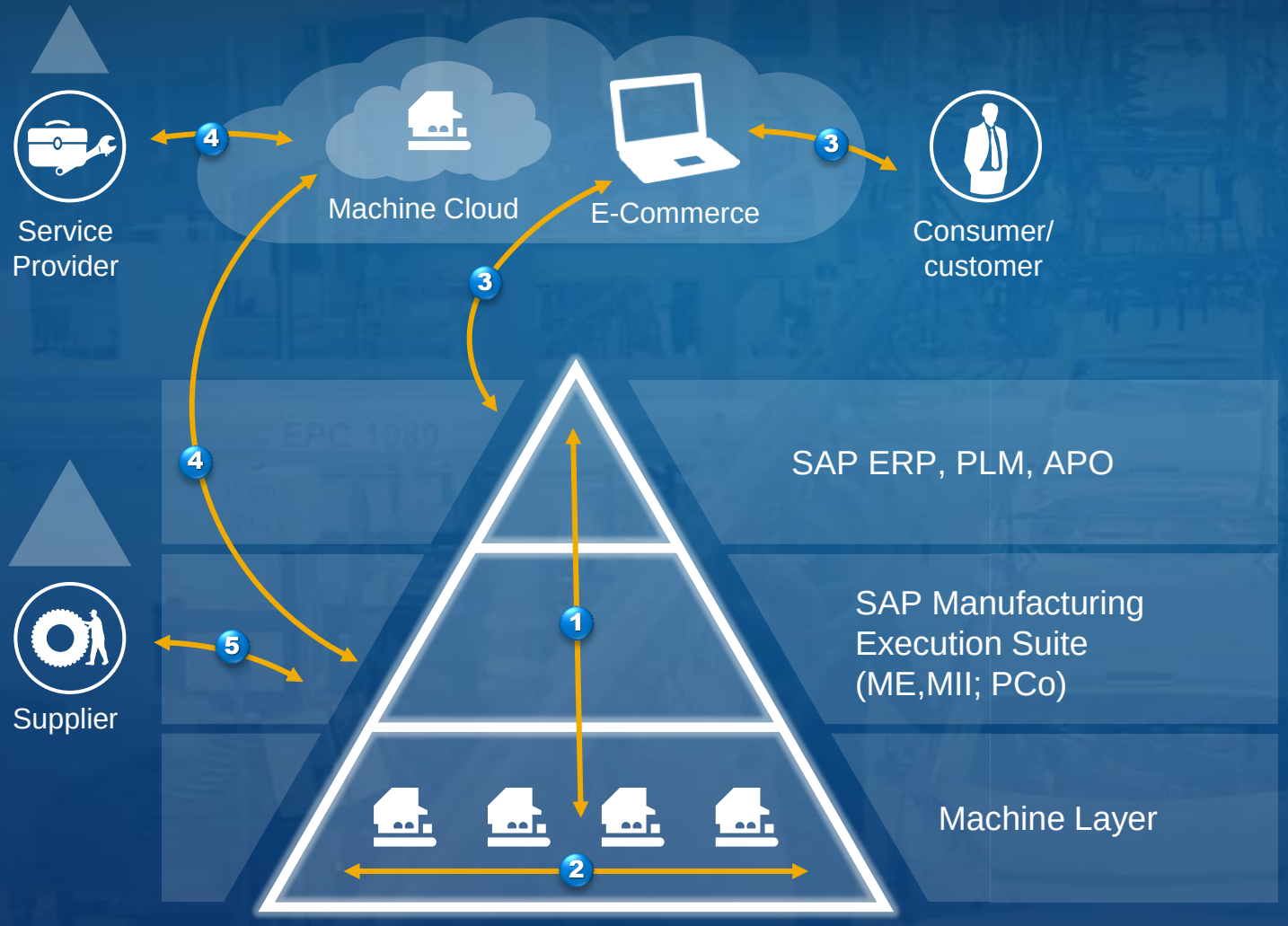
OIF and Industrie 4.0 along Systems & Business Partners



Integration Scenarios

1. Shop Floor to Top Floor
2. Machine to Machine
3. e-commerce Integration
4. Machine Cloud
5. Direct Replenishment
6. …

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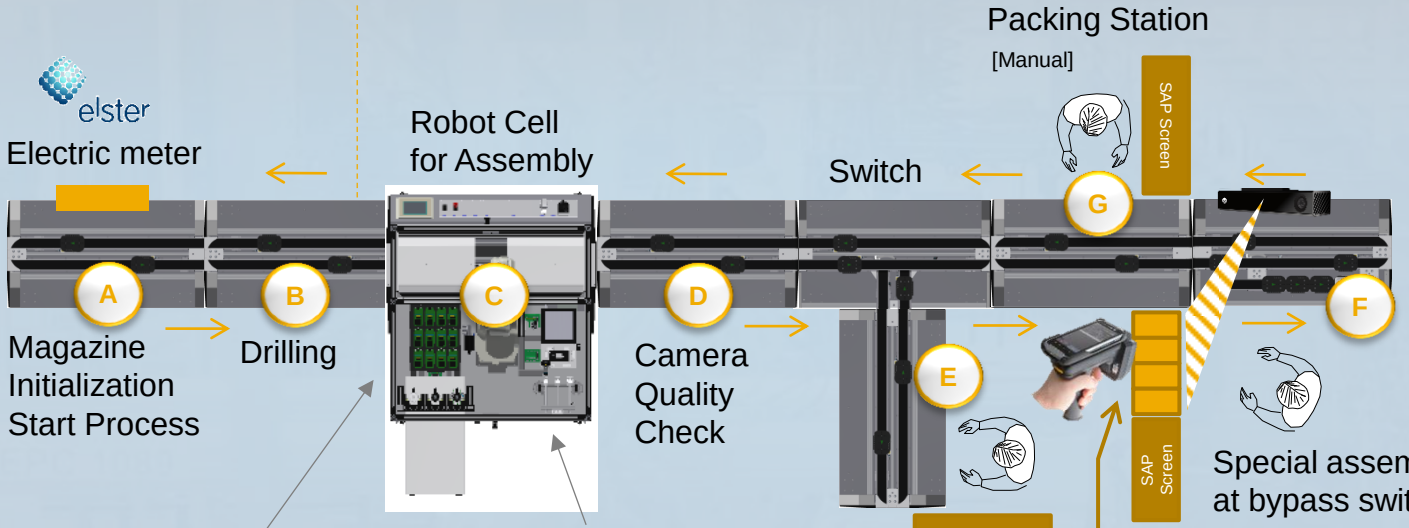
The Connected Open Integrated Factory at Hannover Fair 2015



SYSTEMA

- Release of SFC depending on circuit availability on tray in robot cell.
- Determination of WIP by color until assembly in robot cell

FESTO

- Camera detects circuits on tray with respective colors

SYSTEMA

- Trigger for reload of tray.
- Picking of circuit for assembly

TREBING HIMSTEDT

- Slot configuration of fuses with batch number

Rework & Repair
[Manual]

TREBING HIMSTEDT

- Nonconformance and repair workstation with disassemble defect part and assemble new part (fuse) and document batch data

Special assembly at bypass switch

Production warehouse
Back-loading, Front-picking
[Manual]

IGZ LOGISTICS & IT

- Mobile screen for posting goods receipt from components production to production supply area.
- Microsoft Kinect instructs and supervises pick process from production storage

[SCIT] SALT SOLUTIONS

- SAP ME at milling cutter executes production with CNC program.

Milling Cutter
[Manual]

Label printer
SAP Screen

DSC

- CAD design creates CNC program and makes it available to the milling cutter.

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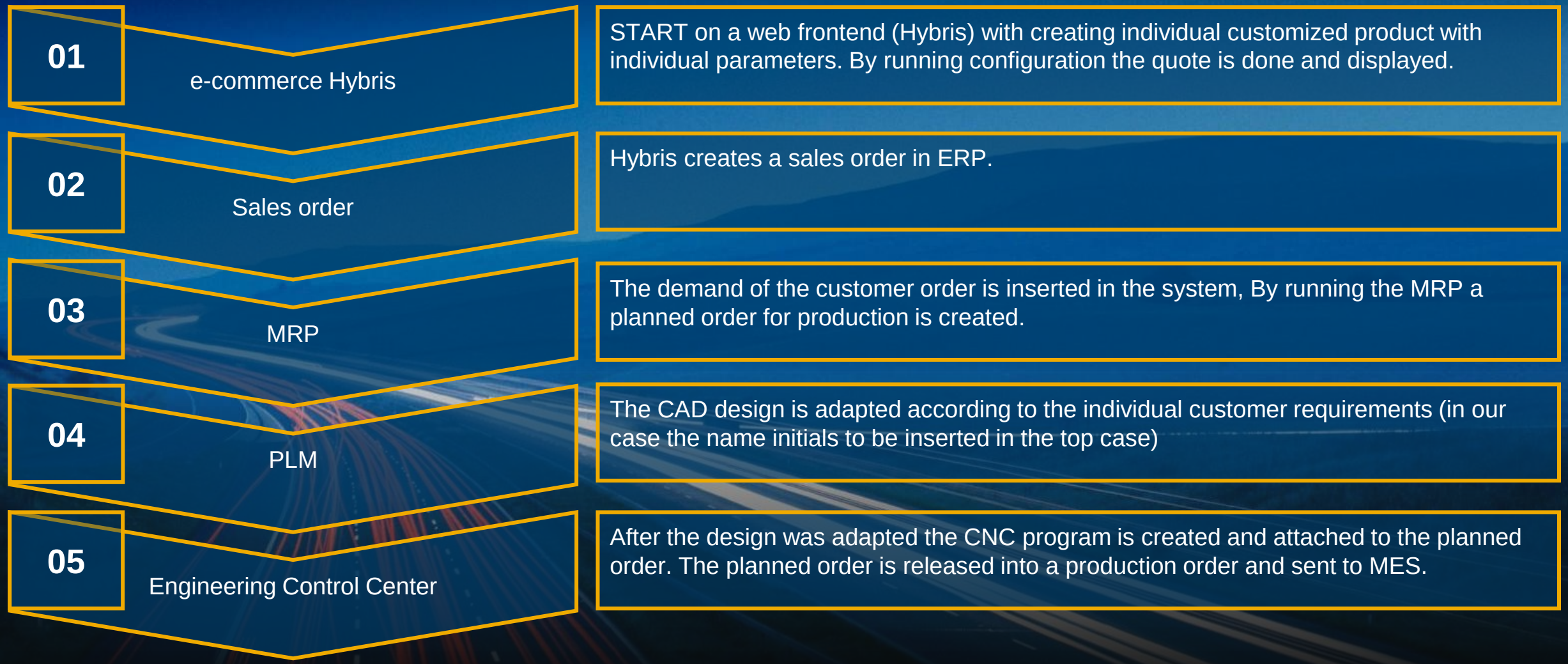
Storyboard

FESTO and SAP Showcase with Integrated Business Processes leveraging lot size ONE



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Storyboard

FESTO and SAP Showcase with Integrated Business Processes leveraging lot size ONE

06	SAP MES	Two production levels: a) Standard FESTO line with production of the individualized base with board and b) FESTO milling machine for production of top case with individualized name initials
07	SAP MES | FESTO Standard	MES orchestrates and manages the production. For individualized production we have high priority orders with self regulation M2M before initialization of product carrier. Manufacturing analytics in real time.
08	SAP MES | FESTO Standard	Individual designed product will be moved on the line into a special assembly area and wait for the special top case. Standard use cases from 2014 will also be leveraged and additional details including mobile screen for SAP ME transactions.
09	SAP MES | FESTO Milling	The production of the individualized top case is started by SAP ME. The special CNC program is loaded by starting the order in the milling machine.
10	SAP MES | Storage	After milling machine produced the top case, label is printed and storage in production warehouse is done via mobile application (JANAM device)

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Storyboard

FESTO and SAP Showcase with Integrated Business Processes leveraging lot size ONE

11	SAP MES | Special assembly	Operator checks if required top case arrived a production warehouse. We have a Microsoft Kinect application checking operator action. By wrong picking visual and acoustic signal is given.
12	SAP MES | FESTO Standard	MES orchestrates and manages the production. For individualized production we have high priority orders with self regulation M2M before initialization of product carrier.
13	HCP IoT | Predicitve	Sensors at the conveyor belts capture electric consumption and behavior. Data is transferred by PCo into HANA and analyzed. Predictions are done and visualized.
14	HCP IoT | Predictions	Resource health projected and the impact on production plan is visualized.
15	HCP IoT | Instructions	Instructions where and how the defect can resolved before asset shuts down, leveraging 3D VE

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SAP Co-Innovation Lab IoT Partner Programs

Identify use-case

- Partners identify and provide customer vetted IoT use case
- Partner builds a business case
- SAP Validates

Prepare

- Partner identifies integration of semiconductors, networking/connectivity needs
- SAP provides SAP IoT enablement
- Partners signs cooperation agreement with SAP

Build

- SAP Provides SAP IoT infrastructure, Coaches, provides support in the development cycle
- Partner develops IoT solution
- Partner deploys right skills to develop application

Showcase

- SAP Events and Forums
- Special IoT events
- Certification**

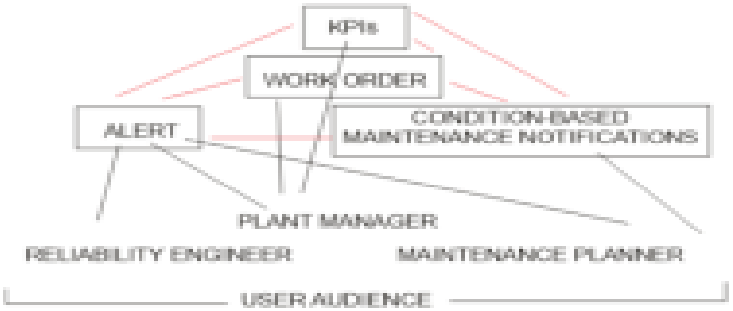
Go-To-Market

- Solution visibility with SAP Field team
- Market Unit/GPO connects
- GTM and pricing models

Create New Business value, with SAP IoT Technology

Operational Integrity Solution for Oil & Gas Industry

MTELL, ROLTA and SAP in COIL Silicon Valley



Partner Facts

- Rolta, existing OEM partner for SAP including OneView™ Dashboard solution
- Mtell, emerging and now SAP HANA certified partner to bring machine learning to SAP Hana IoT
- SAP O&G IBU, validation of core requirements and primary architect for partner Strategy for O&G Ops Integrity solution

Project Activities

- 3 day design thinking workshop with MTELL, Rolta and an O&G customer
- COIL Kickstarter contract establishes agile co-innovation framework
- COIL and project team leadership engaged with SAP partner program stakeholders to develop and execute IoT GTM strategy
- Establishing landscape framework with HCP IoT team to evolve output for an HCP IoT solution

Solution

- Machine Intelligence underscoring Prescriptive Asset Integrity Management
- Rolta OneView™ for visualizing collective intelligence to a single dashboard

Reduced risk in 3 key areas

- Safety of employees and the public,
- Environmental
- Financial risk from items such as product quantity and quality

$ € ¥

- Addressable predictive manténance market of $5.3B
- On target for solution to capture Oil&Gas market share
- Stong IBU forecast for 2015; expanding pipeline of opportunity

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Revolutionary IoT Solutions for the Connected Mine
Illumiti, Vandrico & SAP in COIL Silicon Valley

Partner Facts

- Illumiti is an existing Gold VAR partner for SAP with strong experience in the Mining Industry
- Vandrico, startup and new SAP partner opportunity with its CANARY solution focusing on 2 way safety communications with wearable devices in mining and related industries
- SAP Mining & Metals IBU, endorsed the use case and partners

Solution

- Intelligent Real-time Messaging and situation awareness in the Mine
- Help people inside a mine to identify and respond appropriately to dangerous situations?
- Packaged software solution ready for GTM after 90 day cycle at COIL
- Extensible, expandable to add predictive and prescriptive analytics and leveragefuture wifi and other network communications and wearables

Project Activities

- 3 day Design Thinking workshop with Illumiti, Vandrico, with strong inputs and participation from mining customers
- COIL Kickstarter contract establishes agile co-innovation framework
- Hybrid COIL and HCP landscape framework for HCP IoT team
- Project output directed at parallel GTM discussions
- Conference and customer events as anchors to maximize client engagement and “use case” identification through the completion of discovery days

$ € ¥

- Targeting customers and prospects in mining (30+ mines)

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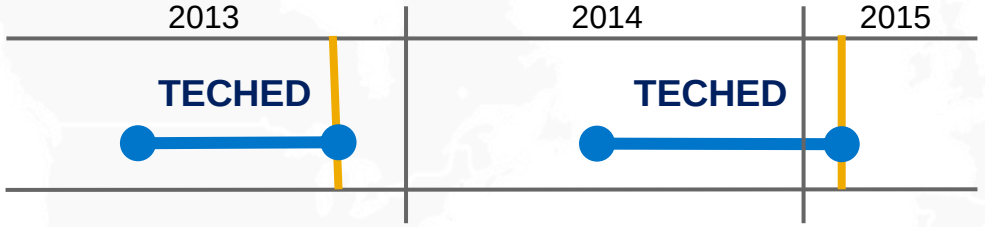
SAHANA – Partner-delivered HANA Applications

A high touch co-innovation partner engagement initiative in India

Enable and coach selected partners to define, implement and deliver high-impact native applications and drive revenue on SAP HANA Platform

Executed in waves



BOSCH
KPIT
HINDUJA TECH
Technology for Business Excellence
ARTERIA
Cognizant
brillio
vCentric
Trendwise Analytics

Project Type

- Adoption Initiative
- Showcase

Deliverables

- HANA applications
- Demos and marketing collaterals
- Certified Apps

Team

- SAP Co-Innovation Lab
- SAP Labs Bangalore
- SAP India

Powered by SAP HANA®

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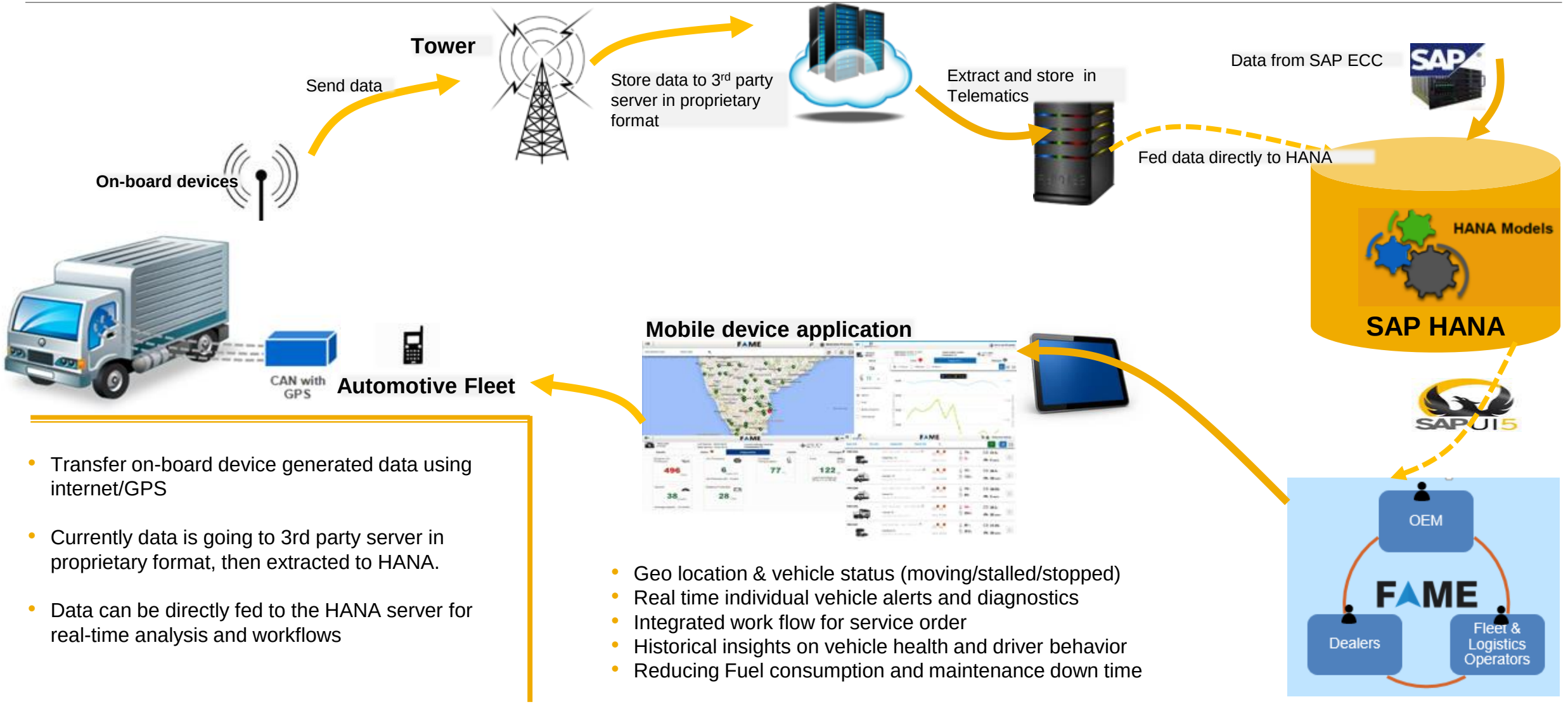
FAME - Fleet Analytics Mobile Enabled

IoT in Automotive in India

HINDUJA TECH



- Transfer on-board device generated data using internet/GPS
- Currently data is going to 3rd party server in proprietary format, then extracted to HANA.
- Data can be directly fed to the HANA server for real-time analysis and workflows

- Geo location & vehicle status (moving/stalled/stopped)
- Real time individual vehicle alerts and diagnostics
- Integrated work flow for service order
- Historical insights on vehicle health and driver behavior
- Reducing Fuel consumption and maintenance down time

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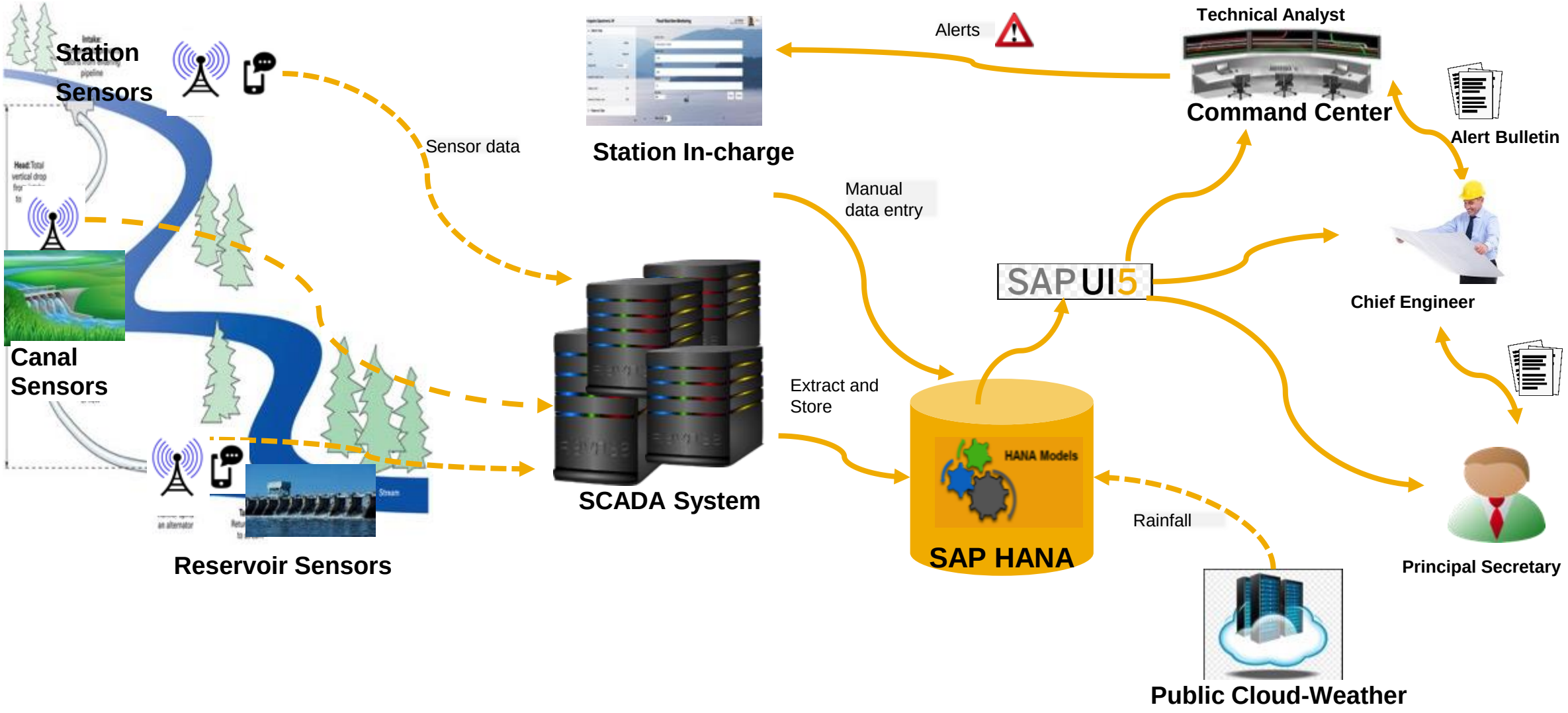
Flood Real-time Monitoring

Co-Innovated IoT application from India

ARTERIA



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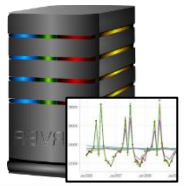
EDopt
Energy Demand Optimizer

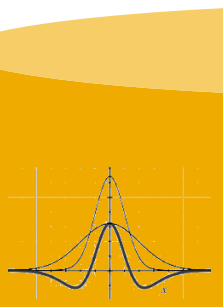


Forecasting engine

Smart meter collection server

Weather data

Spot market prices



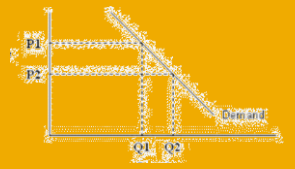
Single exponential Smoothening

Customer Baseline

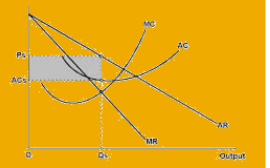
K-Means Clustering

SAP HANA

Arima Time Series



Price Elasticity



Maximization

EDopt Account Manager

- Strategizes demand response programs
- Cost benefit audit
- Manages INC customer
- Customer Conflict resolution
- Manages Team Leads

EDopt Consumer

- Register to a program
- Receive incentives for meeting targets
- Cost benefit analysis

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