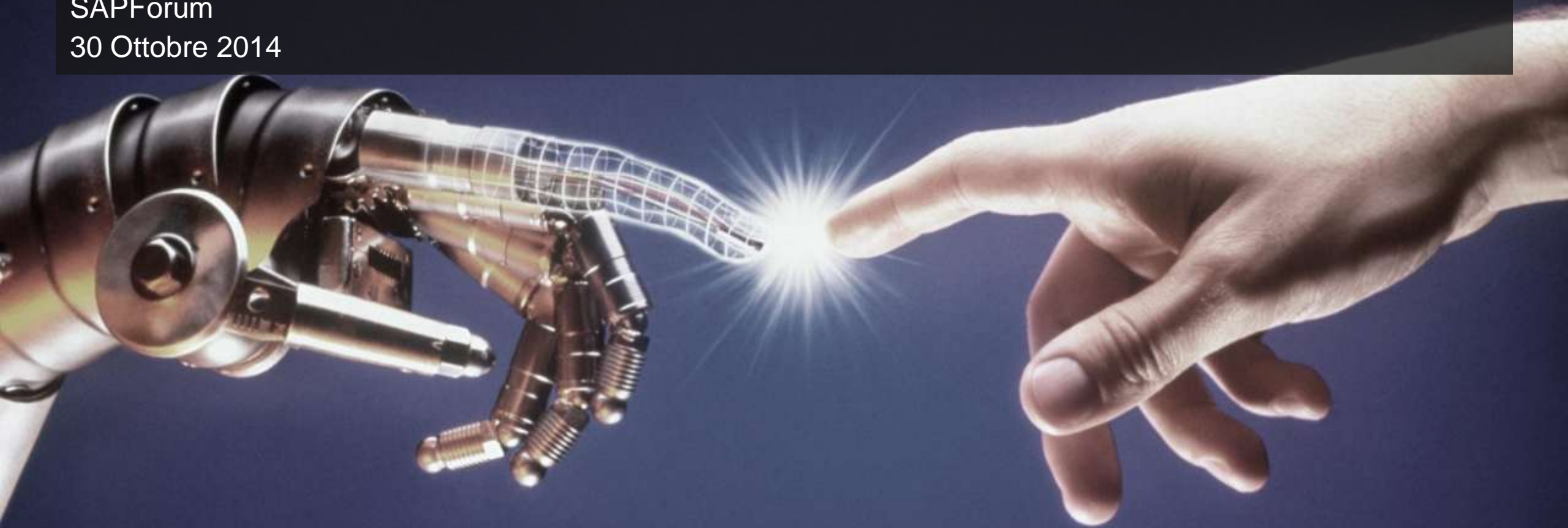


Industry 4.0: realizzare la Smart Factory per essere pronti alla prossima rivoluzione industriale

SAPForum
30 Ottobre 2014



SAP

The world of manufacturing continues to change

The fourth industrial revolution

4th Industrial Revolution

based on cyber-physical systems



3rd Industrial Revolution

use of electronics and IT to automate the production



2nd Industrial Revolution

adoption of work-sharing mass production by using electrical power



1st Industrial Revolution

adoption of mechanical production facilities by using water and steam power



End of the
18th century

Beginning of
20th century

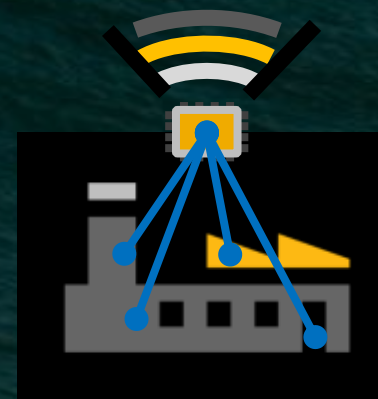
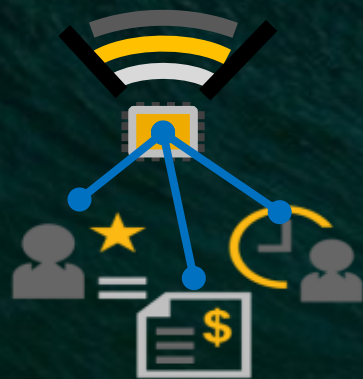
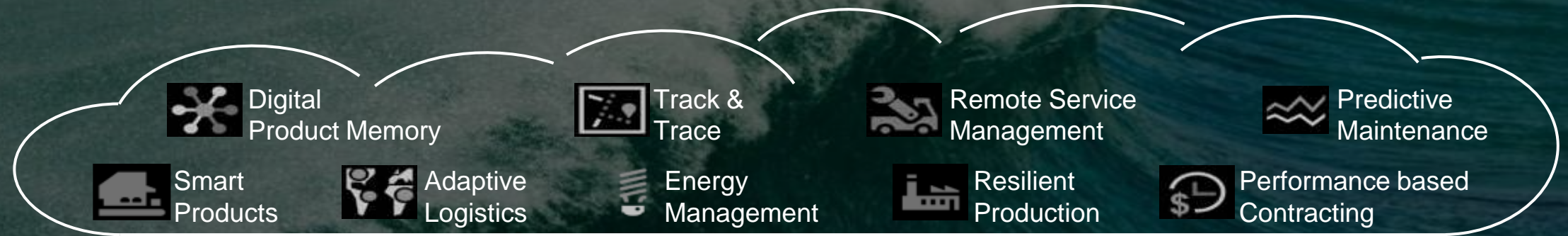
Early 70s

Today

*Source: DFKI (2011)

Industry 4.0 for Manufacturing companies

New business models through deep cloud-based process and data integration



The SMART Factory



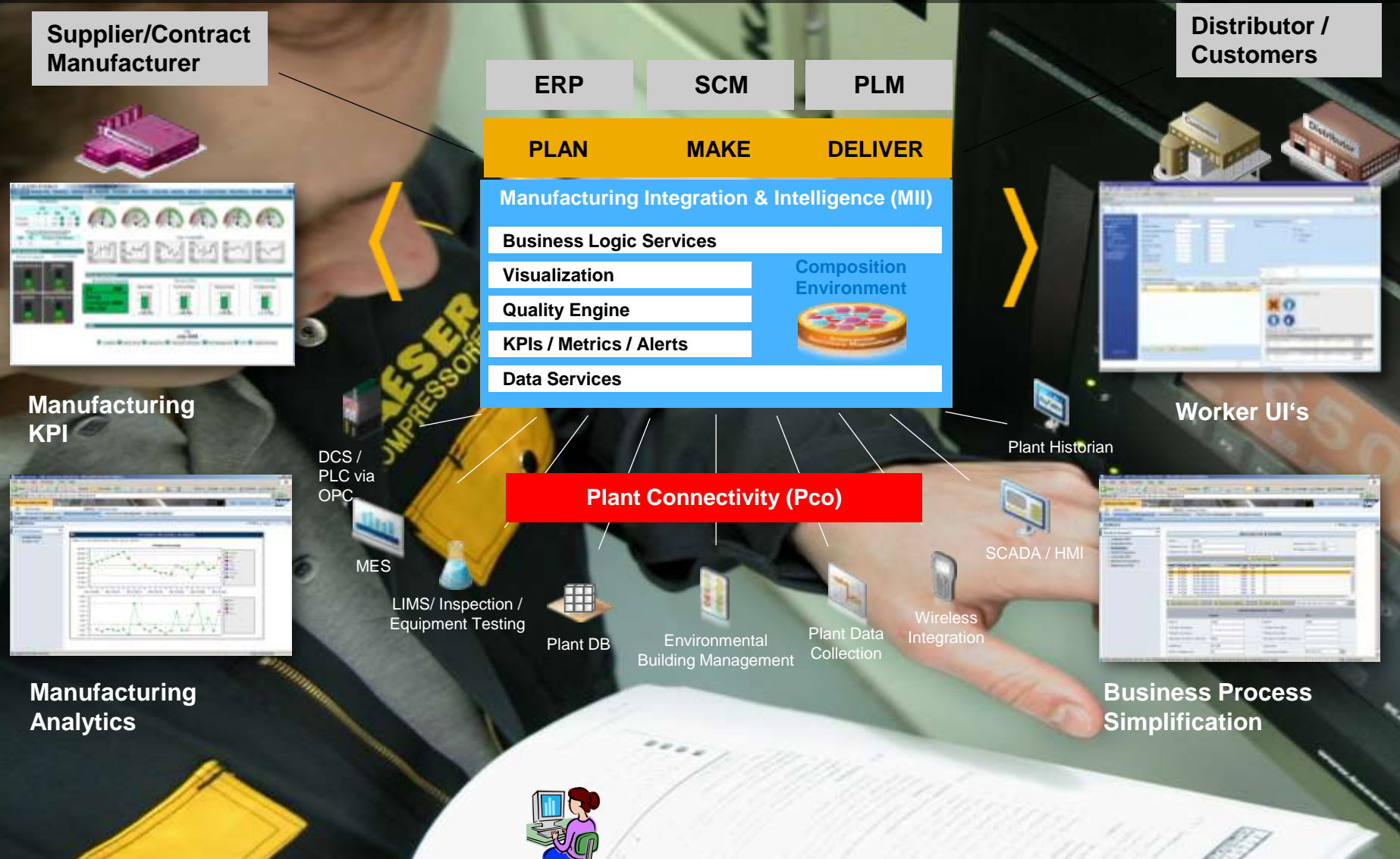
SMART Factory

First Step: Machine Integration



SMART Factory

Subsequent Steps: Supply Chain Integration



SMART Factory

Subsequent Steps: Maintenance Integration

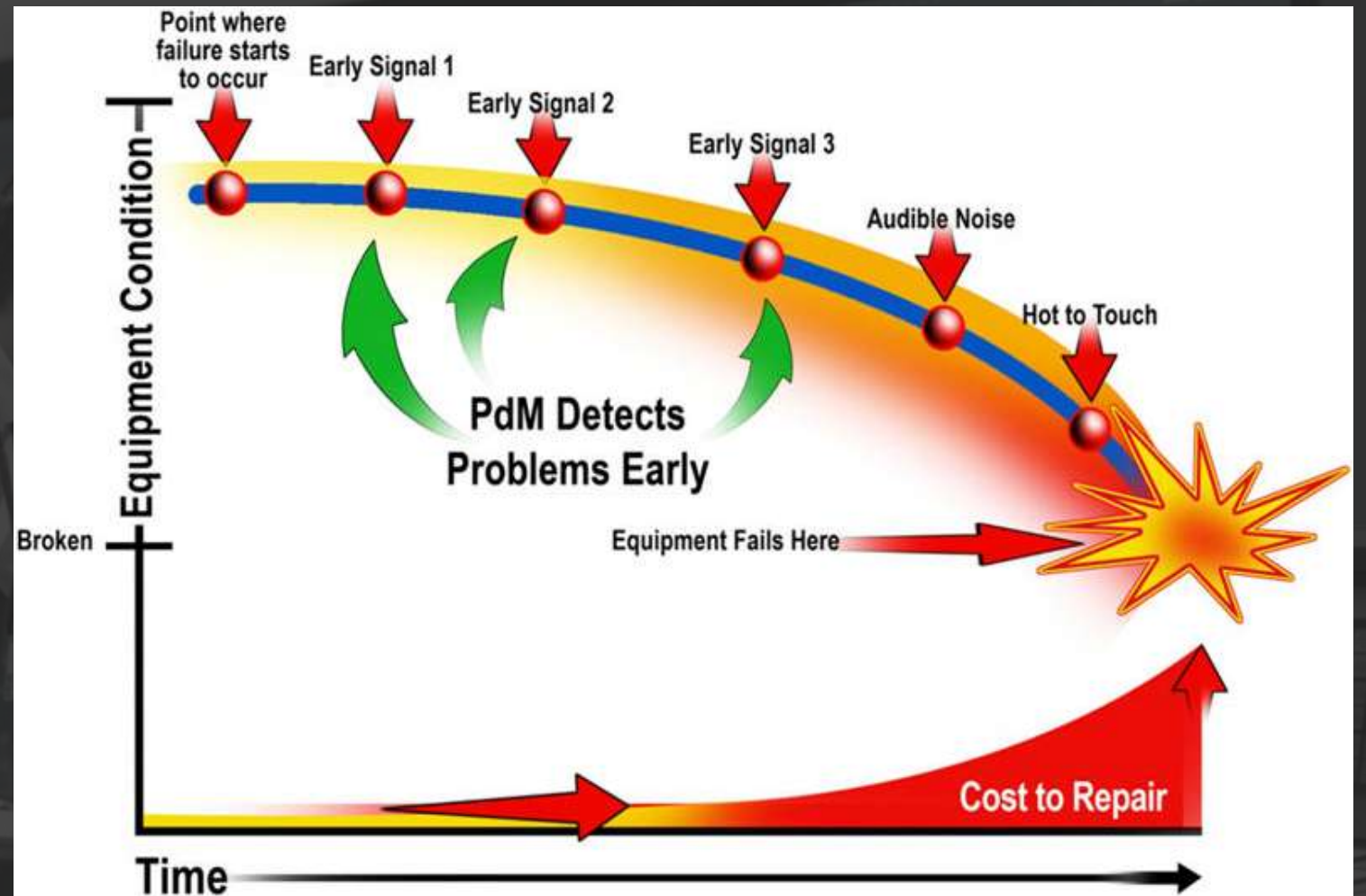


Predictive Maintenance

What is it?

“Predictive maintenance techniques help **determine the condition of in-service equipment (by also using sensor/telemetry data and alerts)** in order **to predict when maintenance should be performed**. This approach offers cost savings over routine or time-based preventive maintenance, because tasks are performed only when warranted.

The main value of Predicted Maintenance is to allow convenient scheduling of corrective maintenance, and to prevent unexpected equipment failures. The key is ‘the right information in the right time’.” (Wikipedia)



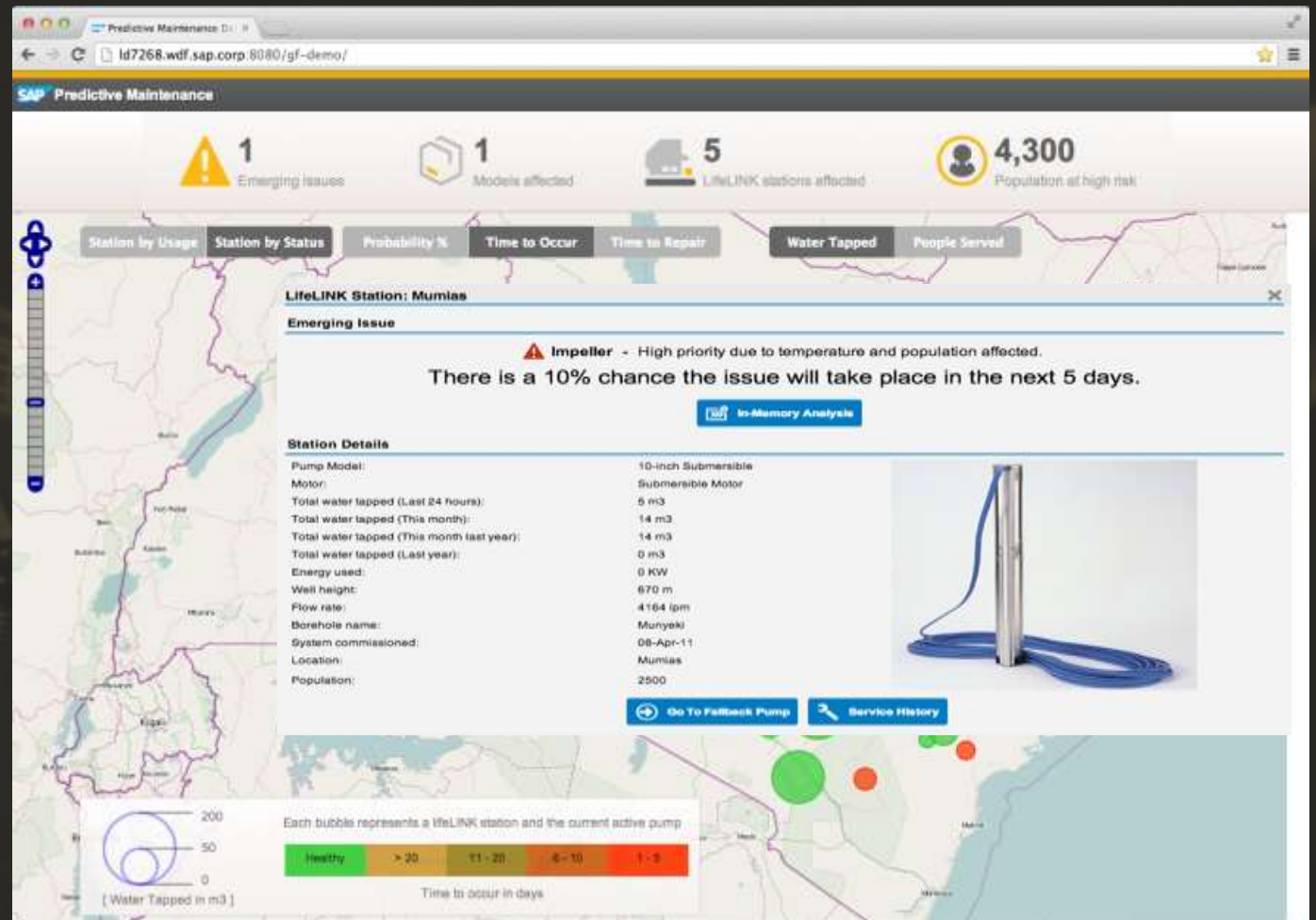
Scenario: Machine Health Control Center

The Machine Health Control Center is the common entry point for warranty managers, service managers, engineers, dealers and fleet managers to get an overview on a populations of vehicles or machines.

It serves the purpose of highlighting key information like actual status, emerging issues, warranty claims, current locations, planned services in one single view. Visualization is based on a map where appropriate or in list format.

Selection by region, vehicle or machine type, status, customer, dealer etc. helps to focus the users activities and information needs.

For each individual vehicle or machine a drill down into the Material Health Fact Sheet which provides any level of detail requested. Follow up actions and workflows can be triggered for both individual or a group of vehicles and machines.



Scenario: Machine Health Fact Sheet

360° Machine health fact sheet is single click information provider for business users about the past, present and future status of the machine in consideration. The Machine health fact sheet is the multi media presentation of business information as well as machine data which can be embedded in an application UI or used as a standalone document.

It includes machine health prognosis, transparency on the actual situation and historical data.

It's highly configurable information content and data presentation features include sticky notes, map/GIS representation of geospatial data, product structure (3D-Graphics) pictures, videos and audio streams as well as product structure (3D-Graphics).

The screenshot displays a 'Machine Health Fact Sheet' for a 'Dental Compressor'. The interface is organized into several sections:

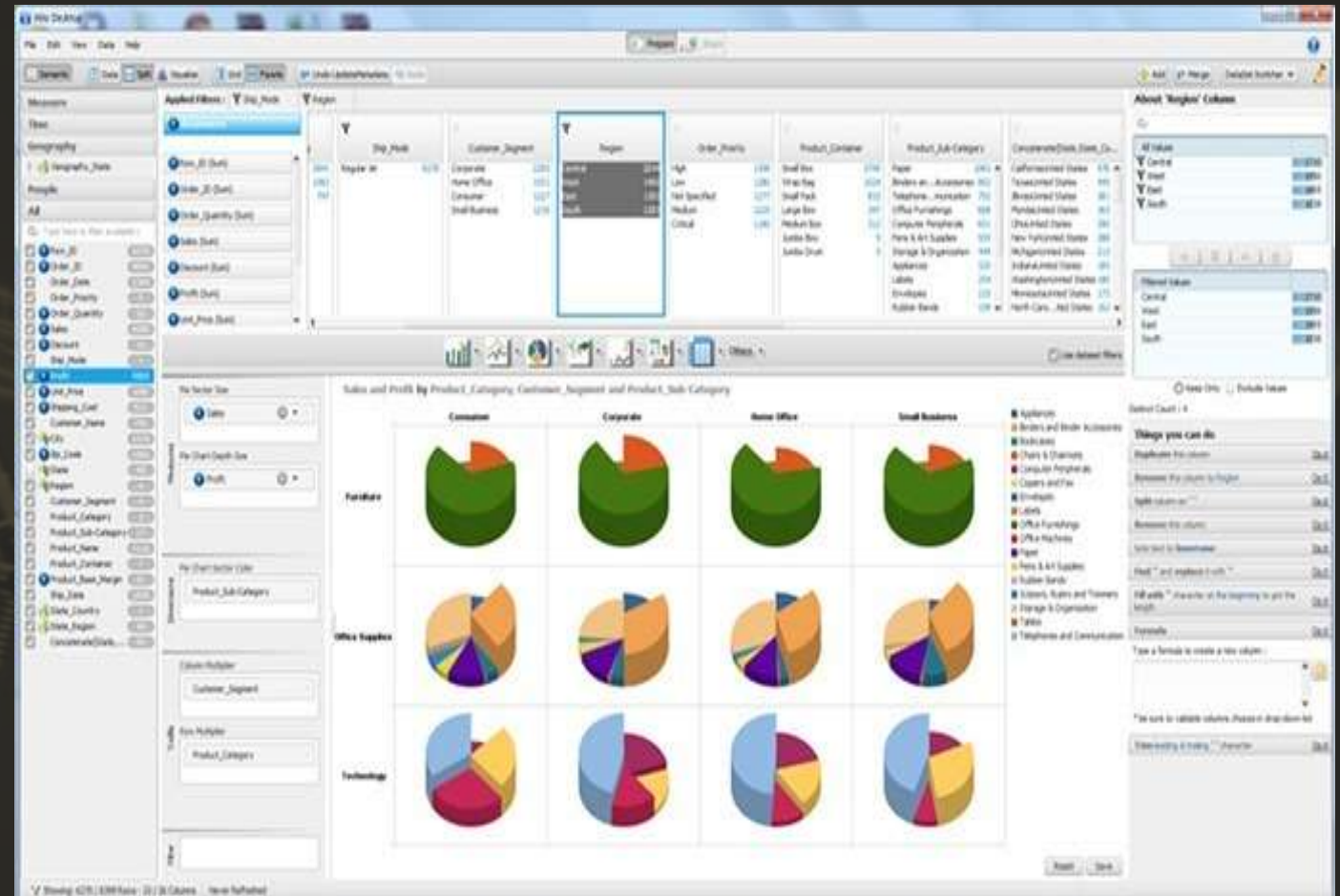
- Header:** Includes a search bar labeled 'Search All'.
- Image:** A photograph of the dental compressor.
- Basic Information:** 'Dental Compressor', 'Model 7G88 V1', 'Machine ID - AA0019320013', 'Controlling Area - CC1', and 'Located in Basement, BULD03'.
- Key Metrics:** A table showing 'Installed on 5th Sep 2008', 'Last Servicing 3 months ago', and 'Health Prediction Servicing required in 2 months'.
- General Data:** 'Acquisition Date 11th Jun 2008' and 'Total Cost of Acquisition 35,000.00 Euros'.
- Technical Data:** 'Compressor Dimensions 520 x 378 INCH', 'Gross Weight 250 KGS', 'Pressures Scale 8 Bars Maximum', and 'FAD 65 - 524 L/Min'.
- Implementation Details:** 'Installation Engineer Simon Smith' and 'First Start-up Date 12th Sep 2008'.
- Related Information:** A grid of tiles including:
 - Health Prediction:** 'Next Servicing 2 months', 'Critical Parts Alu Case', 'Estimated downtime 3 Days'.
 - Compressor Parts:** '47 Parts From 3 Suppliers'.
 - Technical Spec & Help Docs:** Links for '1. FAQs', '2. Generic Problems', and '3. Technical Specs & CAD'.
 - Service History:** 'Last servicing for this compressor was done on 5th May 2012. Service engineer was Michael Krenkler'.
 - Warranty & Claims:** 'Warranty Valid Until: 03 Dec 2013' and 'No claims have been done for this compressor'.
 - Environment Information:** 'Temperature 30°C', 'Humidity 68%', 'External Sensor Yes', and 'Controller CC1'.

Scenario: Emerging Issues

Emerging Issues is an application which acts as an “early warning radar” system for all active machines or vehicles deployed in the field. The system is primarily used by engineers and analyst to monitor for groups of machines showing potentially defective behavior and the creation of evidence packages which can be used as input to root cause analysis.

The objective of this application is to identify issues early thus improving production processes, limiting warranty costs and improving the up-time of the equipment for the end user.

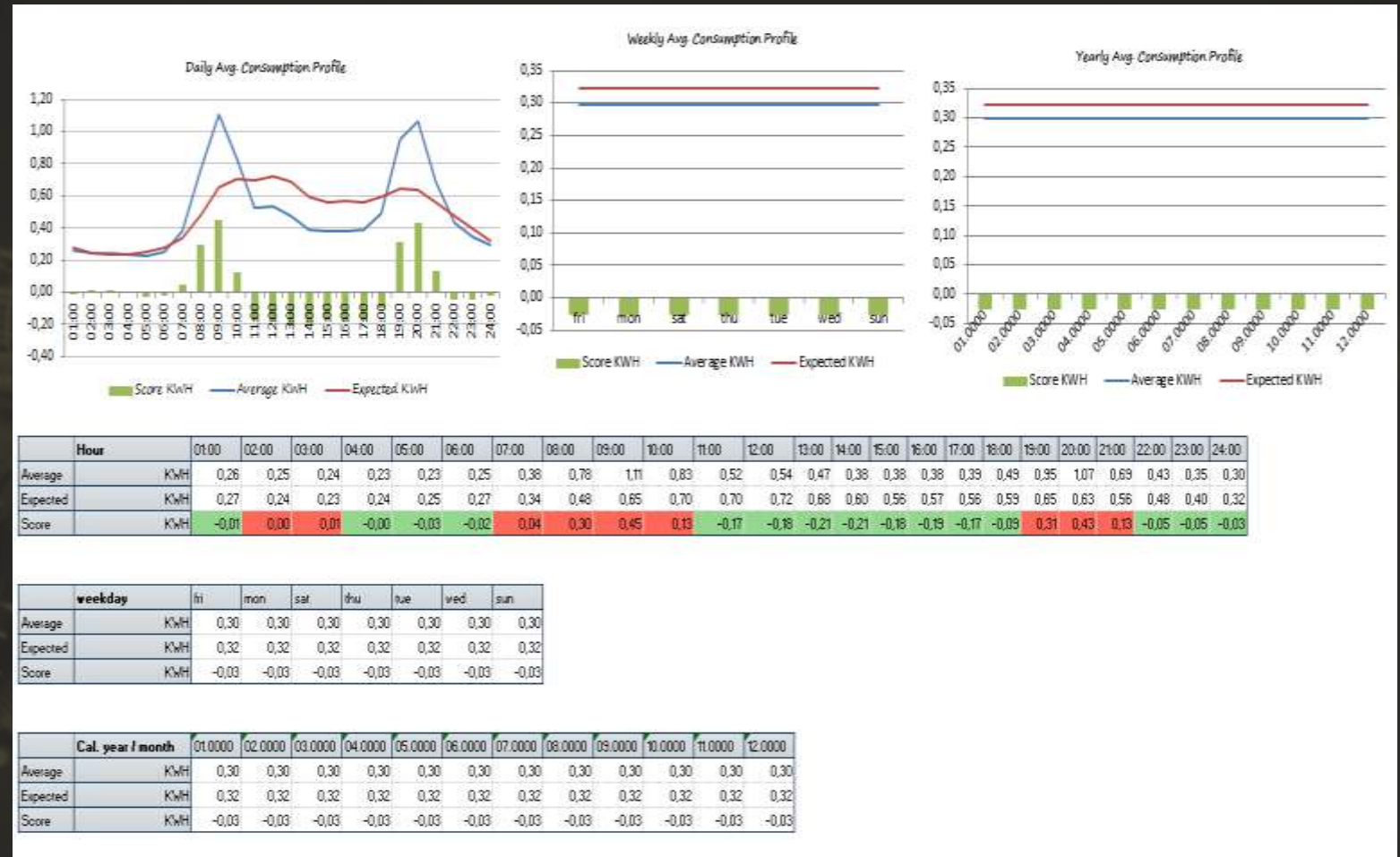
The output of this application can be used in many follow-up processes and systems including the Machine Health Control Center to manage workflows, assign priorities, track progress and monitor costs.



Scenario: Energy Analytics

Energy Analytics enables the analysis of energy consumption data in order to identify energy efficiency problems, potential machine anomalies or the total amount of carbon generated by each machine or a fleet of machines. The system is primarily used by fleet managers to monitor and improve energy consumption and track energy conservations measures.

The results of the energy analysis can be integrated into service applications, and engineers to identify potential machine issues due to excessive use of energy.



The 4th Industrial Revolution

Be Ready For The New Business Opportunities

Optimize your own production

- Predictive maintenance
- Usage based billing

Help your customer optimize what they produce

Create additional value beyond the product

and Supply Aggregation

OEM



The customer's customer



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Thank you!



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