Enabling the Business-Based Internet of Things and Services

RFID i Danmark

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In-JeT ApS

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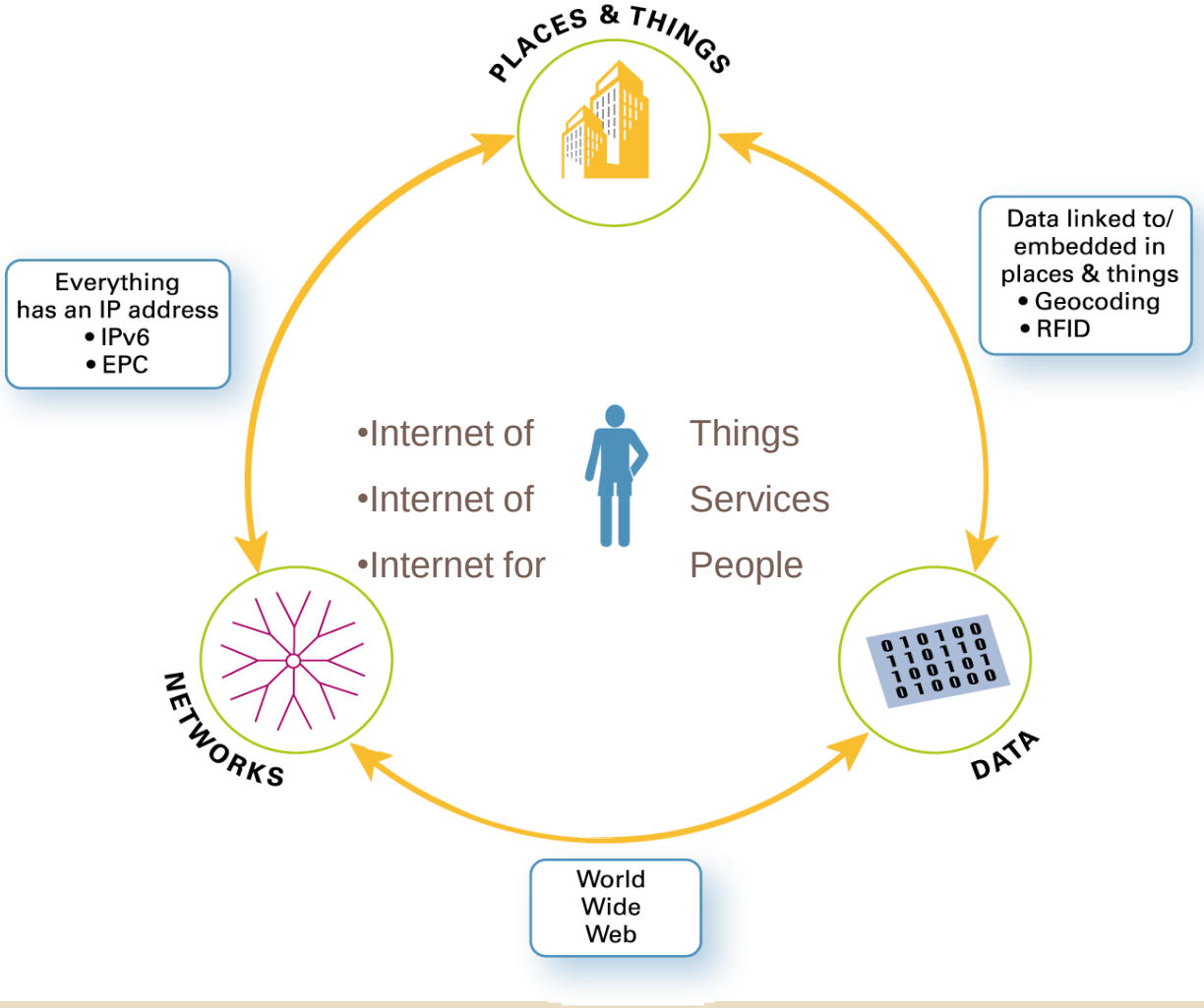
European Commission
Information Society and Media

Enhanced product information

Contextualization of ebbits

- Background…
  - Internet of Things (People and Services)
  - Focus on the Future Internet
- The project
  - Partners
  - Work structure
- Vision, objectives and innovations
  - Platform structure
  - Technology breakthroughs
- End-to-end business services
  - Industrial manufacturing
  - Agricultural production

The Future Internet



IoTS ecosystem

- Pervasive digital environment
- Populated by digital components
- Evolves and adapts to local conditions

- The Digital Ecosystem of IoTS is not a piece of software – it is not technology…
- It is a digital infrastructure that transport services and knowledge and so empowers the whole business network

The ebbits project

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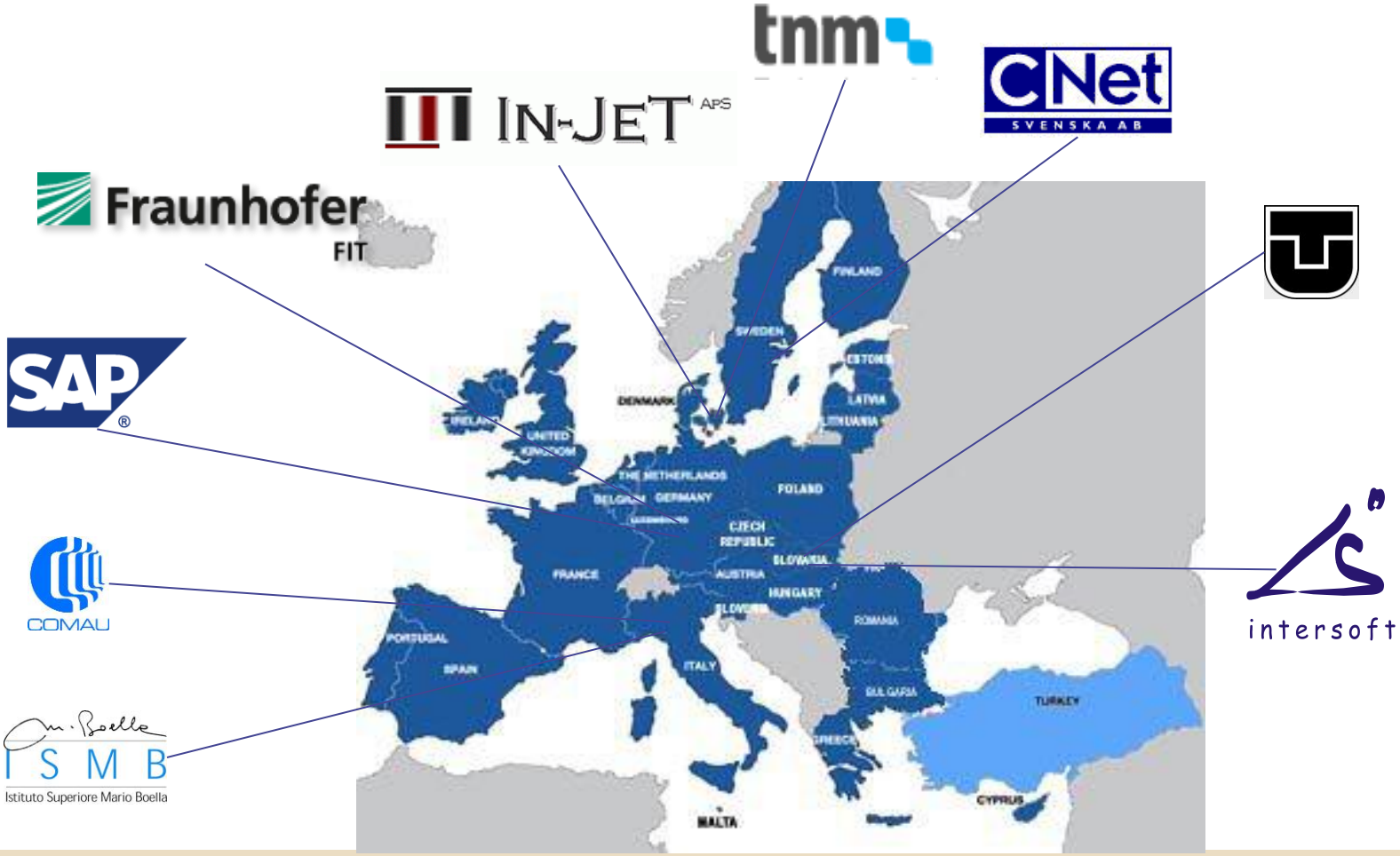
Project funding details

- Call 5 of the 7th Framework Programme:
  - Objective ICT-2009.1.3 Internet of Things and Enterprise environments
  - Target outcome a) Architectures and technologies for an Internet of Things
- Project details
  - Start: 1 September 2010
  - Project form: Integrated Project
  - Duration: 48 months
  - Scope: 1,091 person months – 9 partners – 12m€ budget – 8.4 m€ funding

The ebbits consortium

FP7 Integrated Project - 48 months - 9 partners - 12 MEuro budget, 1091 pms.



The FInES cluster

- The FInES cluster is composed of FP6 and FP7 funded projects, as well as experts and stakeholders from all over Europe.
- The aim of the cluster is to encompass past and current research experts and organisations in the Future Internet for Enterprise Sysrtems

Vision & objectives

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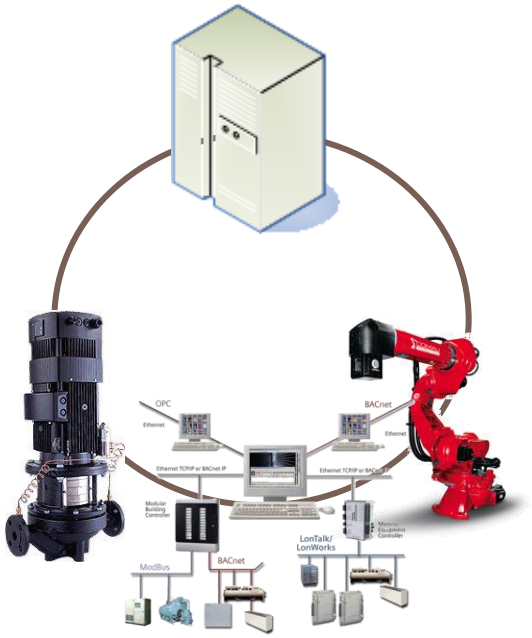
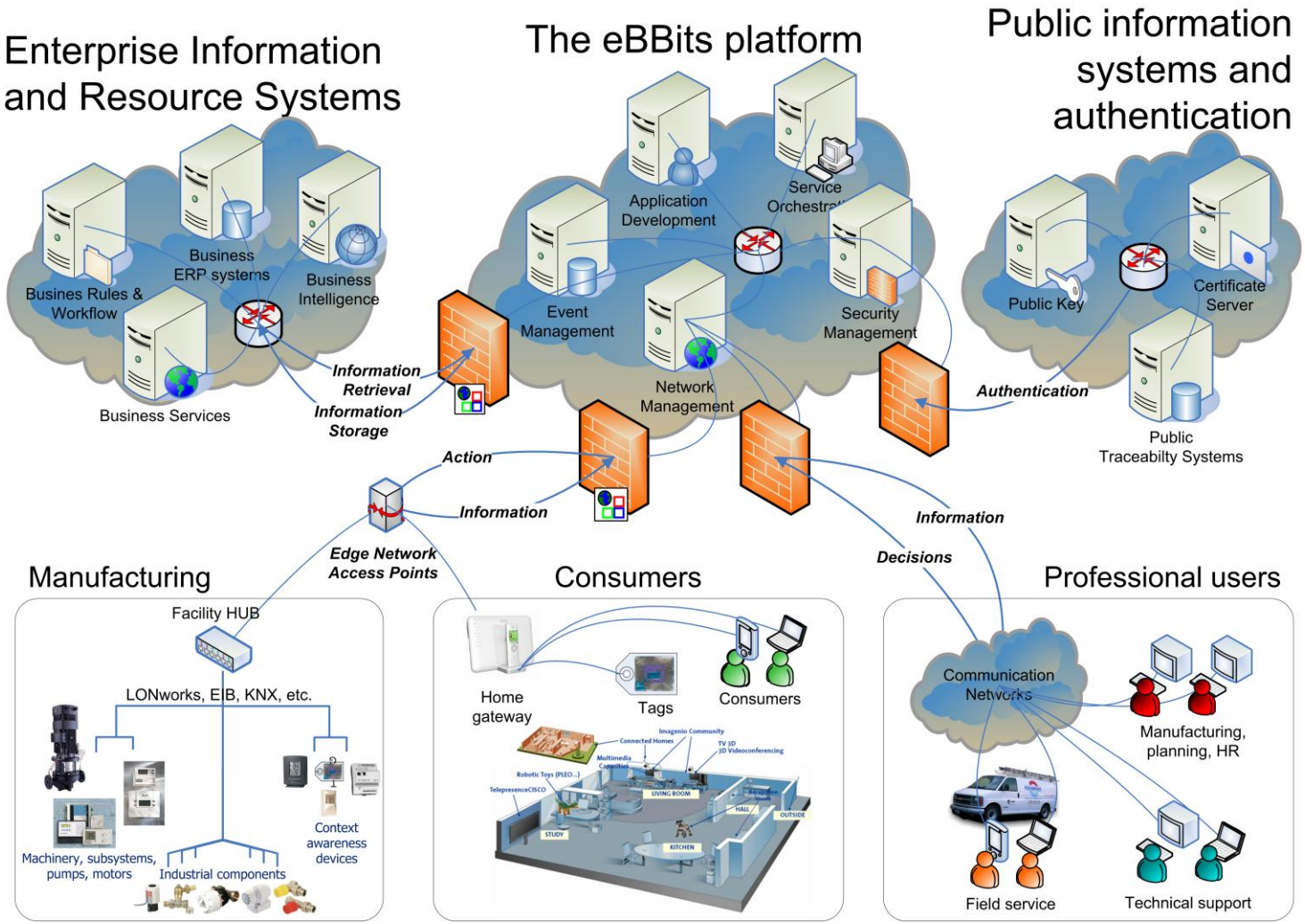
ebbits is a cloud platform where…



- *enterprises can integrate physical devices, systems and components directly into optimising systems*
- *enterprises can realise interoperability between various subsystems in manufacturing environments across manufacturing cells, manufacturing lines end entire manufacturing plants*
- *enterprises can easily and cost-effectively network their products with mainstream enterprise systems in order to support higher value-added, interoperable solutions.*
- *enterprises can provide support for authentication and traceability*

Capture environmental data

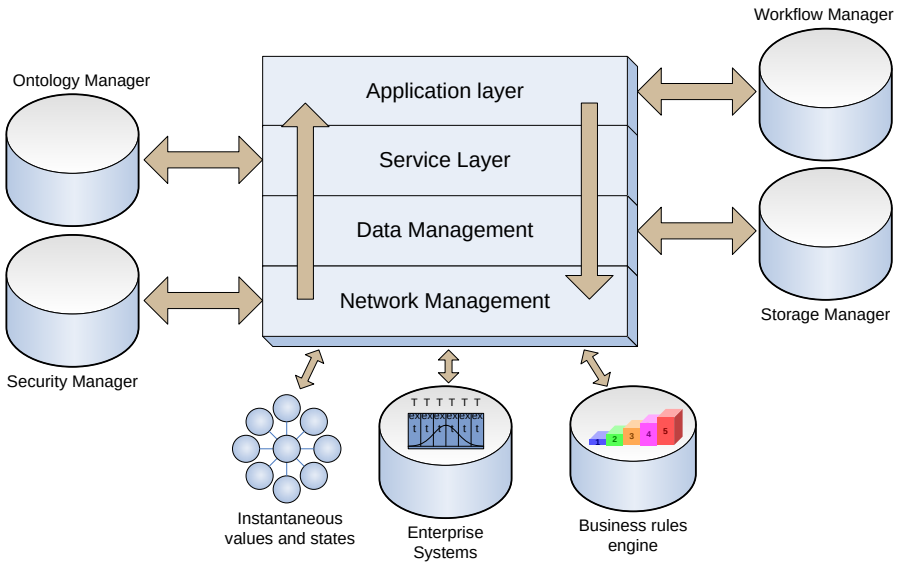
Enabling IoTS technologies



Technological objectives

- Internet of Things Architecture Technology using Service oriented (SoA) architecture integrating the physical world for maximum interoperability between heterogeneous entities.
- Communication Technologies with distributed discovery architecture and unique physical identification of loosely coupled objects.
- Scalable Network Technologies integrating wired and wireless technologies using structured P2P networking layers in a transparent and seamless way.
- Organisation, storage and semantic query of massive datasets in a distributed environment
- Cloud services with goal oriented orchestration and support for semantic interoperability, context awareness, and distributed decision support including workflow management and business rules processing.
- Security and Privacy Technologies enabled for cloud computing with models for decentralised identification, authentication and trust.

ebbits innovations



- Physical World Sensors and Networks
  - Novel P2P-based network architecture leveraging on opportunistic communication and information propagation paradigms
  - Semantic interoperability between heterogenous WSN/ physical world technologies and enterprise systems
- Data and Event Management
  - Layered Event Management Architecture for handling of physical, network, application and business events
  - P2P-based event management
  - Rule-based service orchestration

ebbits innovations

- Centralised and Distributed Intelligence
  - Standardised system for fusing sensor data and integrating in business process
  - Ontology-based context model which allows automatic definition of data for service communication
  - Context aware services handling different types of context as well as self-awareness aspects.
- Semantic Knowledge Infrastructure
  - Optimisation of real-time reasoning for huge data sets
  - Hybrid reasoning by connecting conventional data sources to semantic models
- Enterprise Frameworks for Lifecycle Management
  - Taxonomy and metrics for production optimisation
  - Sustainable business framework for the IoPTS based on dynamic value constellations

ebbits end-to-end business applications

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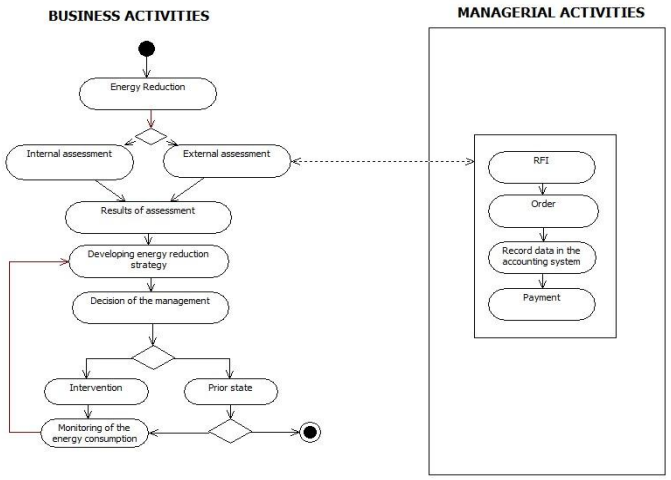
Get to know your car!

Raw materials
Energy
Water
Lubricants
Chemicals
Paint
Emissions
Etc…

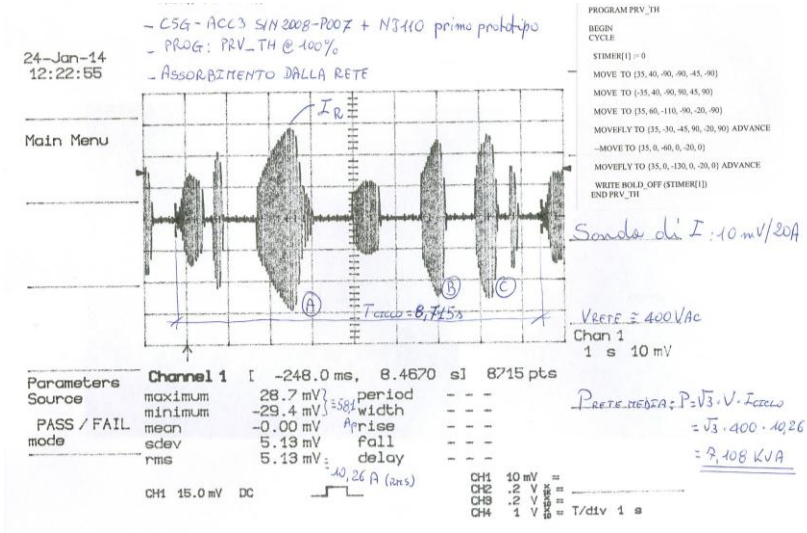
Per part
Per assembly
Per vehicle

Use case example 1



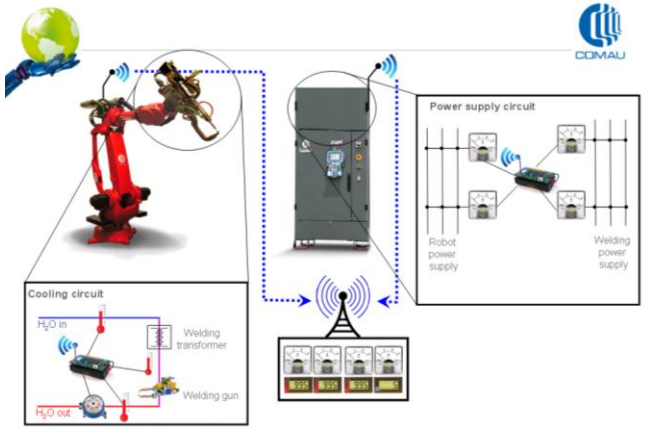
- Energy reduction process
  - Manual retrieve of data from field
  - Manual analysis of data

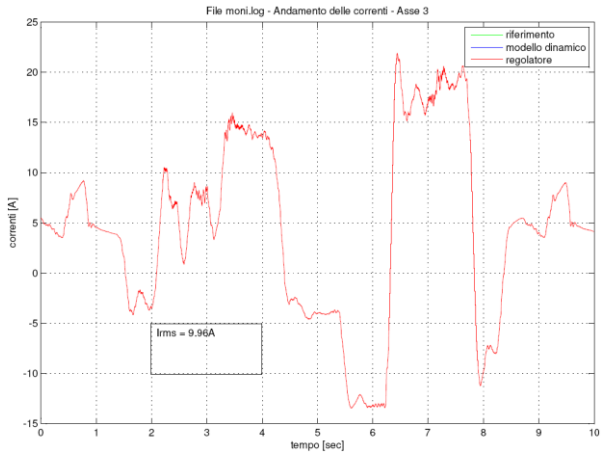
- Today, moving analysis data around is a highly manual job



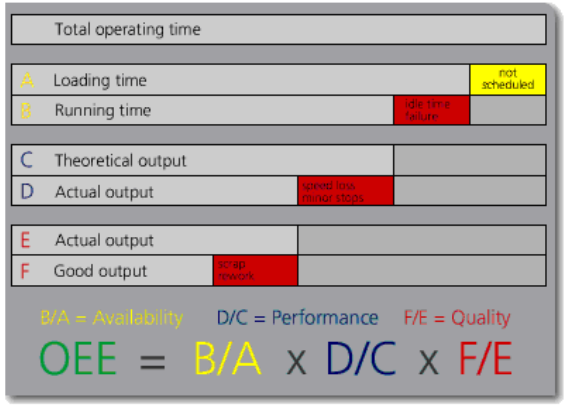
Using ebbits

- ebbits provides infrastructure to automate analysis and bring data to the interested parties
- ebbits traces and assesses automatically the result of the applied improvement of the
ment





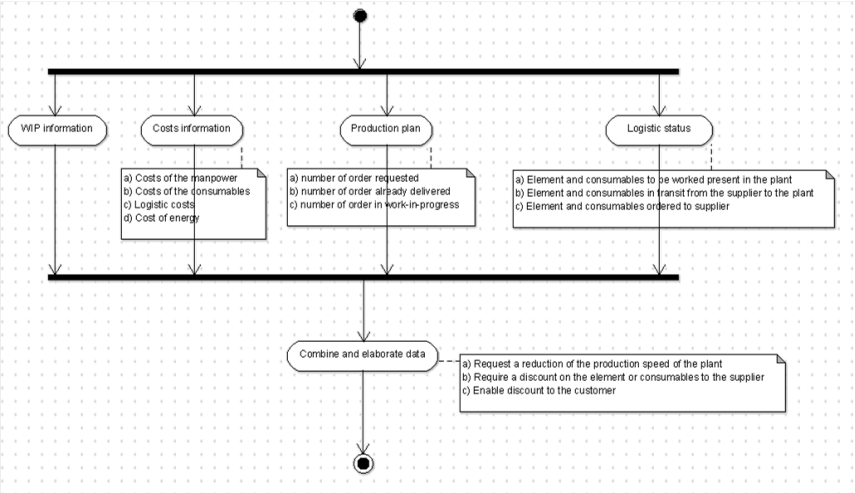
Production energy optimisation



- Implement real-time optimisation metrics, including energy, in manufacturing processes
- The OEE index is the product of three factors: Availability, Performance, and Quality
- By adding the energy consumption parameter we are able to define a new optimisation tool, the OEEE Overall Equipment and Energy Efficiency index

Use case example 2

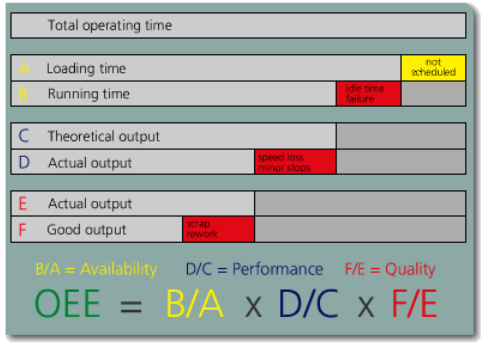
- Monitoring of the process performance
  - Data retrieved manually or through a query from an incompatible system



- Incoherent data
- Impossible to correlate information

Using ebbits

- Using ebbits all data will be correlated and consistent
  - The infrastructure is compatible with all the devices and applications
  - Query can be performed over distributed devices and datasets
  - Data are consistent and can be used to calculate information



Agriculture and the IoTS

- Traceability along the food supply chain is basically the combination of two processes:
  - intra-enterprise traceability and
  - inter-enterprise traceability (Waksman2003).
- If enterprises working in the same sector adopt different ways to describe the input, the production processes, and the output, it will not be possible to communicate information either to providers or to consumers.
- Care should be taken when implementing solutions of traceability at the farm level
- Support for branding in the Intrepid platform will help to overcome these challenges and will be analysed in details in the business models

Some farm-to-fork ”values”

- Traceability for policy enforcement
- Branding and positioning of products
- Promotional offers
- Safety of products
- Authenticity of products
- Shelf-life
- CO2 footprint
- Milage food
- Contextualization
- Recipies
- …

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