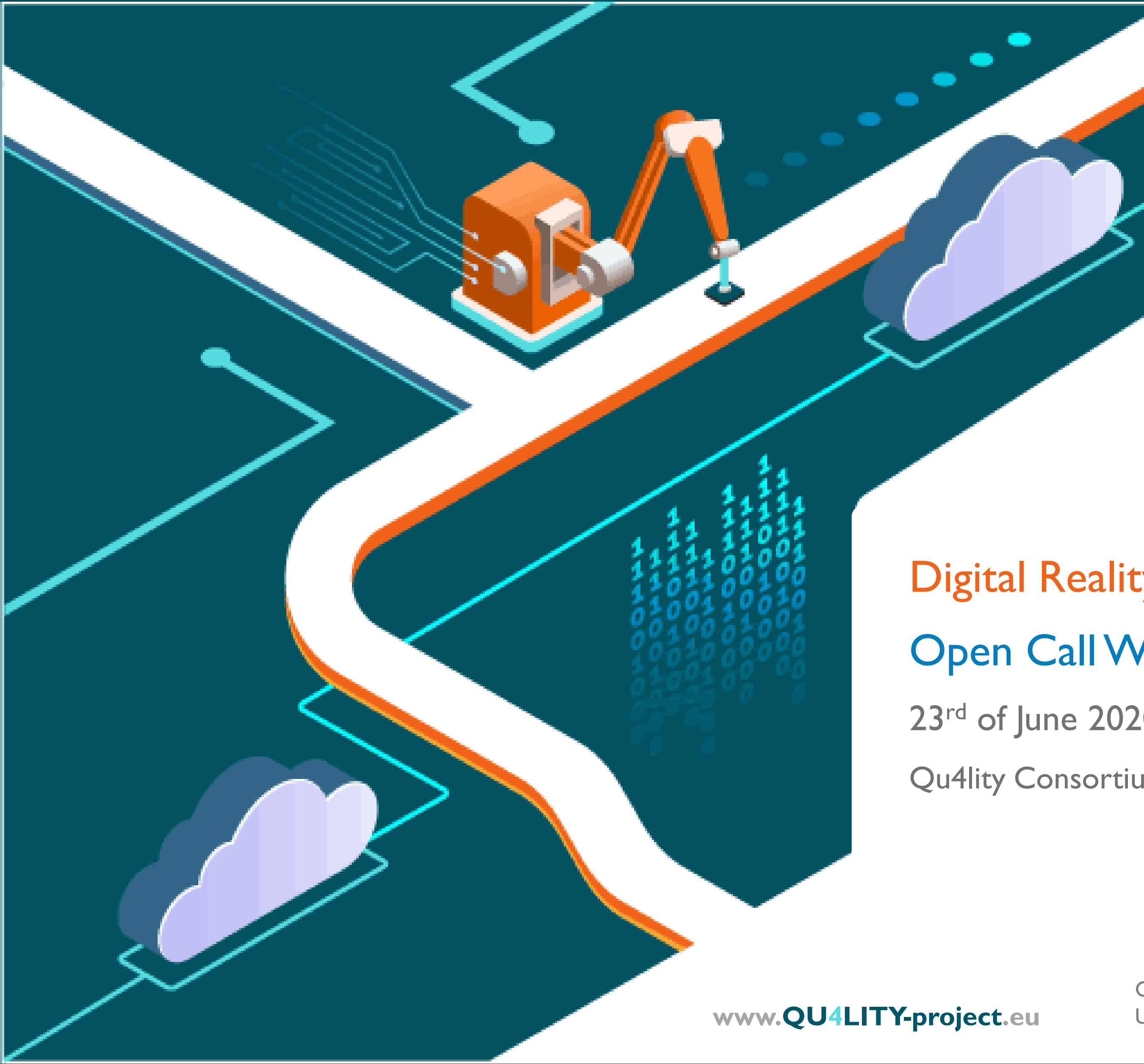


QU4LITY

DIGITAL MANUFACTURING PLATFORMS FOR CONNECTED SMART FACTORIES

Digital Reality in Zero Defect Manufacturing

Open Call Webinar

23rd of June 2020

Qu4lity Consortium

www.QU4LITY-project.eu

Co-funded by the Horizon 2020 Programme of the European Union. Grant agreement ID: 825030

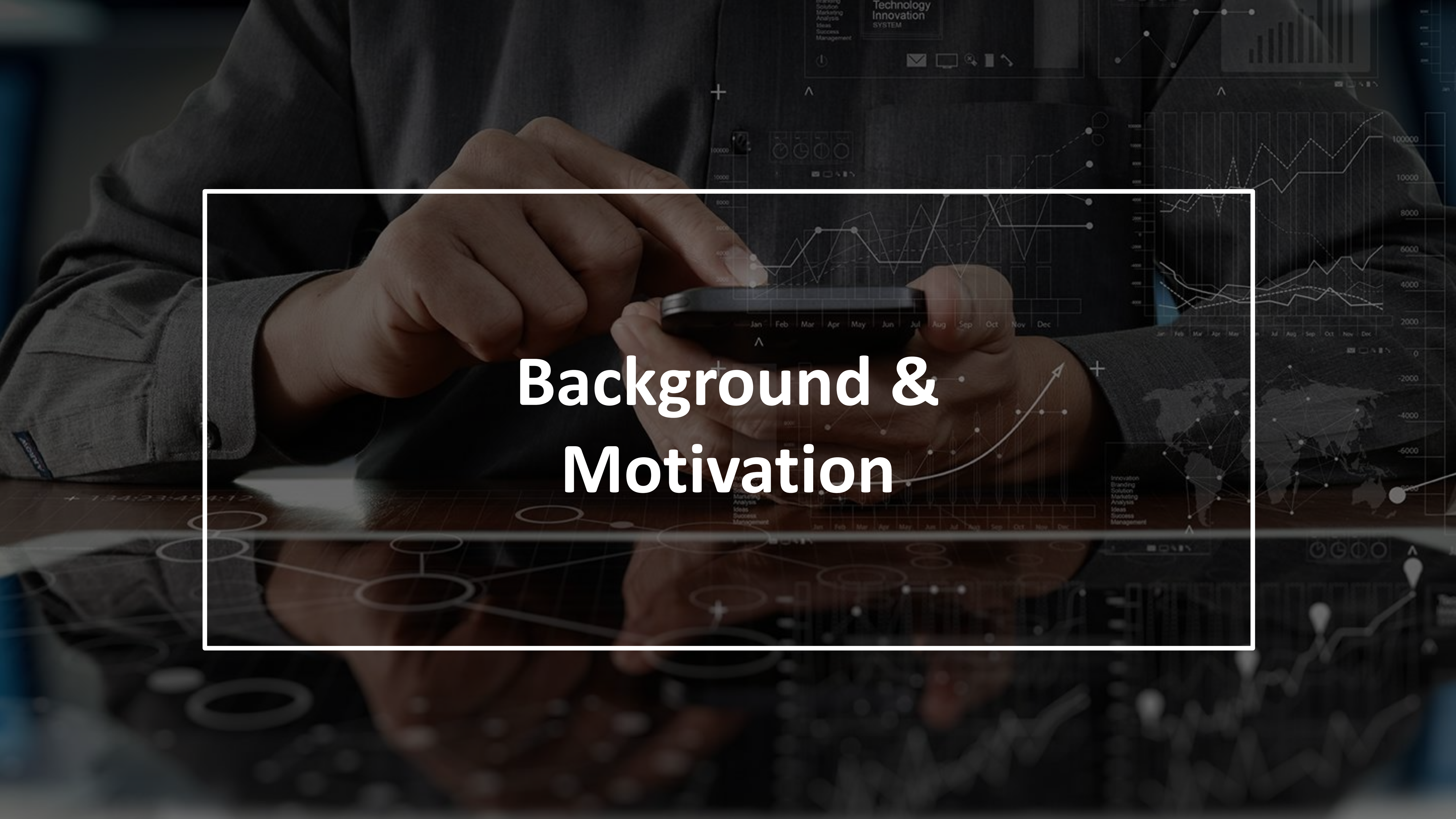
Agenda

1. Introduction to the Qu4lity project **(J. Rodriguez -** ***ATOS*****)**
2. Introduction to the call (**C. Polcaro -** ***INNO*****)**
3. Technical and business aspects
   - Qu4lity Reference Architecture **(A. Marguglio -** ***Eng*****)**
   - Type A call: Qu4lity Enablers **(J. Soldatos –** ***Intrasoft*****; I. Metaxa –** ***Atlantis;*** **M. Isaja –** ***Eng*****;)**
   - Type B call: Challenge **(P. Petrali, C. Turrin -** ***Whirlpool*****)**
   - Qu4lity Market platform **(J. Soldatos -** ***Intrasoft*****)**
4. Questions and answers

Introduction to the Qu4lity project

Jorge Rodriguez - ATOS

Project No:	825030
Project Full Name:	Autonomous Quality Platform for Cognitive Zero-defect ManUfacturing 4.0 Processes through DigitaL ContInuity in the ConnecTed FactorY of the Future (QU4LITY)
Duration:	39 months
Start date:	January 1st 2019
Partnership:	45 partners, 13 countries
Strategic Objective:	DT-ICT-07 (Digital Manufacturing Platforms for Connected Smart Factories)
Total Eligible Cost:	19 520 535.28 EURO
EC Contribution:	15 998 180.54 EURO (1 M€ open call)



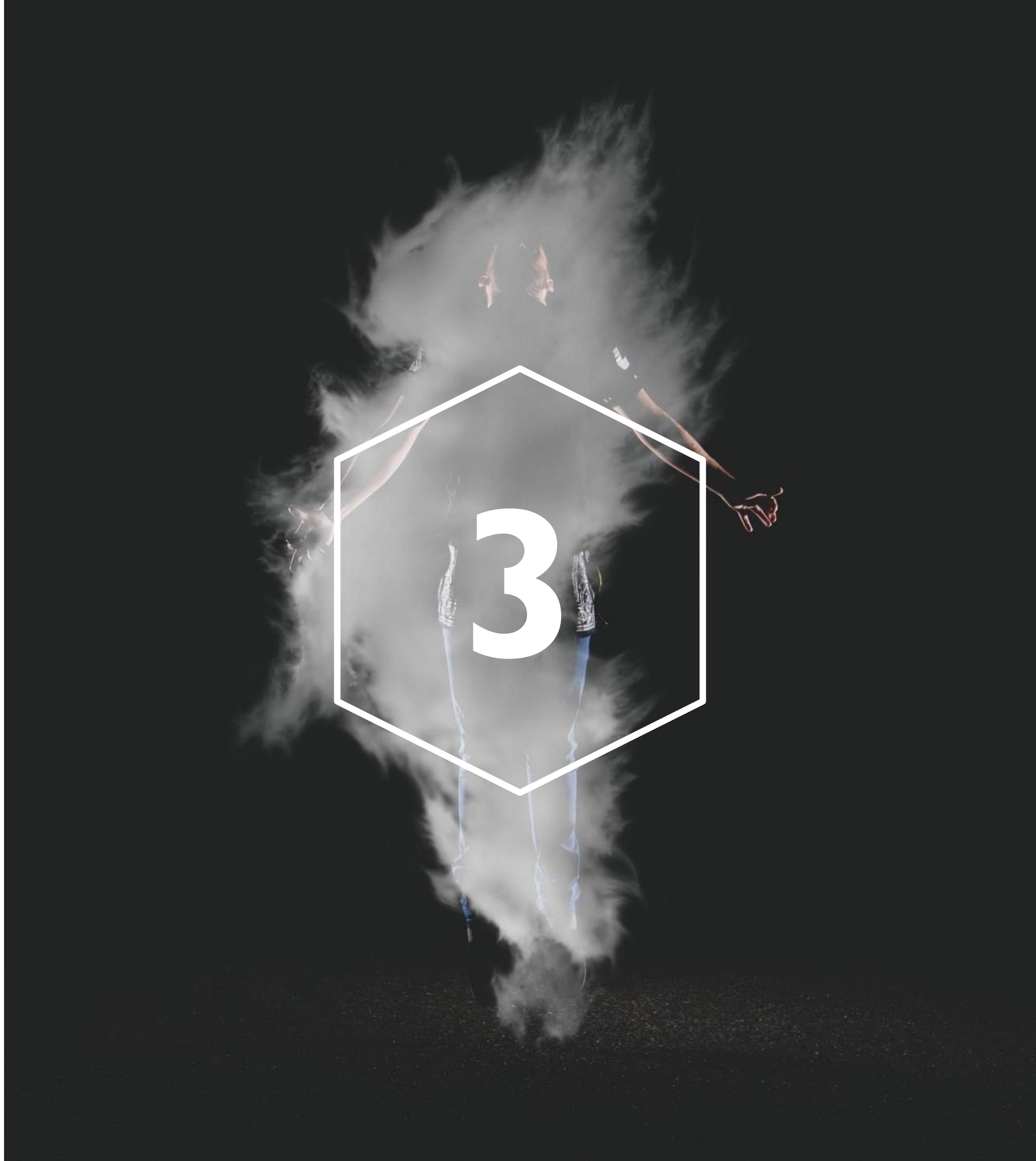
Background & Motivation

50%

Production ends as scrap

Zero Defect Manufacturing and Industry 4.0

- Costly & time consuming deployment.
- Lack of digital continuity.
- Poor SME engagement.



Enable a radical shift from state of the art production quality methods to the disruptive **Autonomous Quality (AQ)** concept (End-to-End Intelligence & Automation)

Enable manufacturers and solution providers (including SMEs) to adopt **innovative Cognitive Manufacturing solutions for ZDM**.

Key Outcomes

Digital enhancements to state of the art ZDM equipment and processes

Reference architecture and blueprints for integrating AQ in the factory

Enable the composition of **diverse digital manufacturing platforms** in cognitive ZDM systems that enable AQ

Pan-European innovation ecosystem that will boost the development, validation and wider uptake of ZDM solutions based on the AQ paradigm

ZDM
Pilots

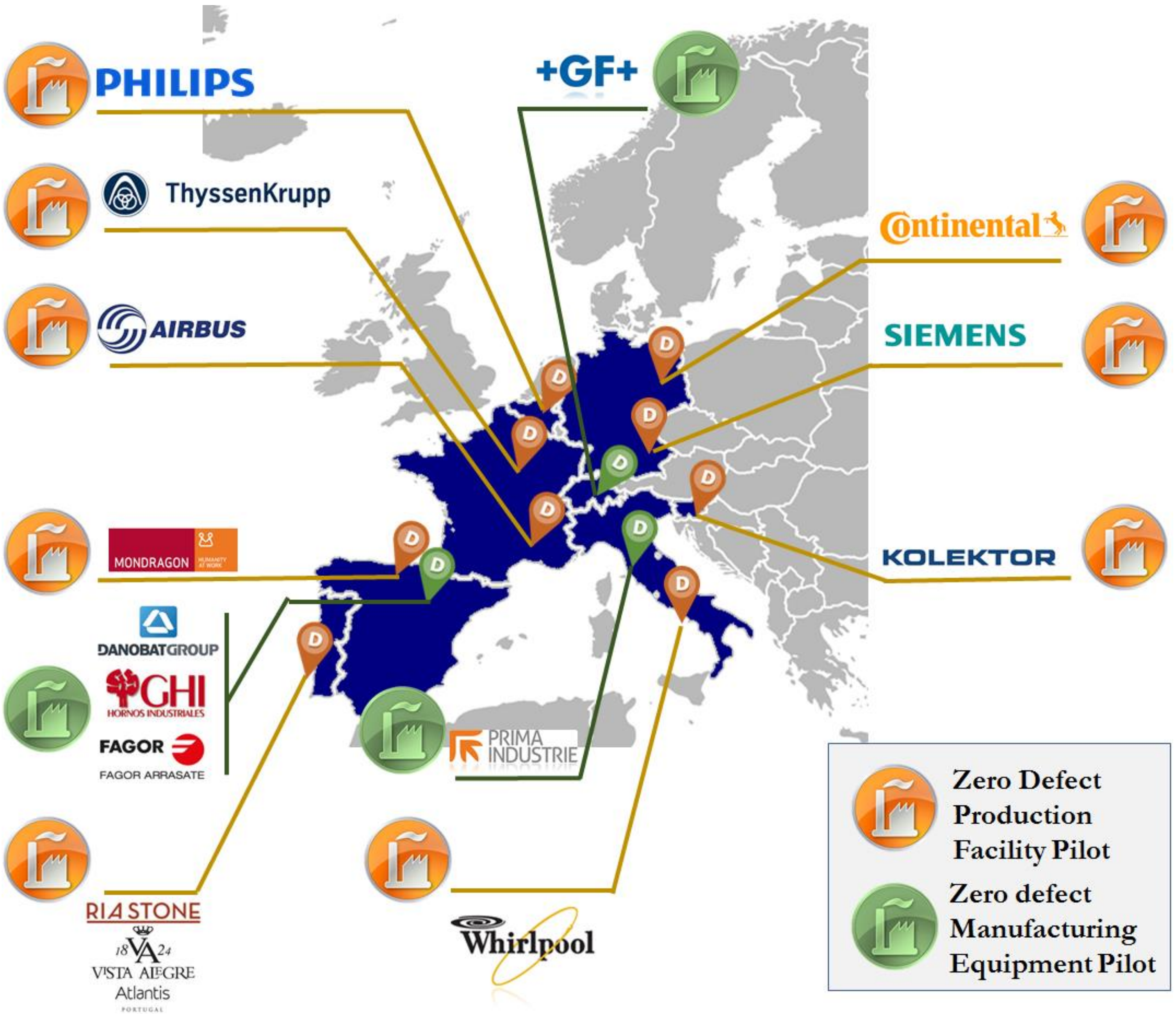
FACTORIES 4.0

9 ZDM Pilot Factories

Automotive & electronics (4)
White Goods & Appliances (2)
Aero (1)
Railway (1)
Ceramics (1)

5 ZDM Equipment Pilots

Milling machines
AGVs
Stamping Press
Additive Manufacturing/Laser Systems
Industrial Furnace



Experimentation Facilities and Testbeds

TNO Regions of Smart Factories (ROSF) Field Lab

FhG-IPA Arena 2036

AIC Automotive Smart Factory (ASF)

CEA Factories of the Future Lorraine (FFLOR)

VTT Smart Machines and Manufacturing Competence Centre (SMACC)

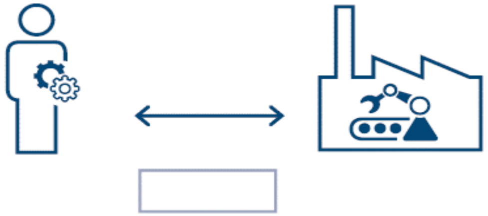
POLIMI FoF Lab

JSI Reconfigurable Cell

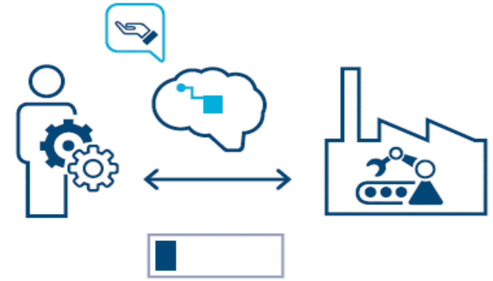
Introduction to the call
Concept, topics and conditions

Carmen Polcaro - INNO

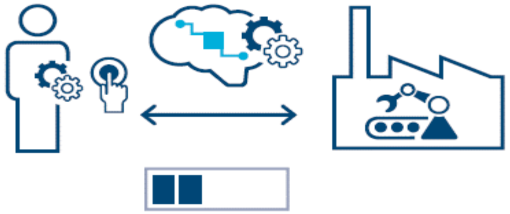
AI for Factories 4.0: Autonomous Factories



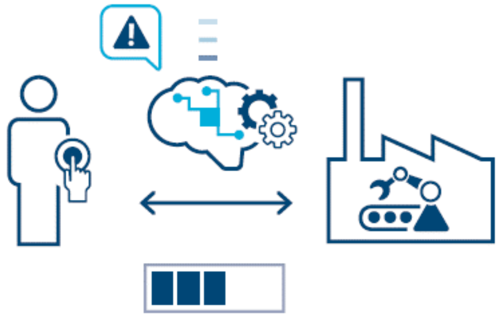
Autonomy Level 0
No autonomy, human beings have full control without any assistance.



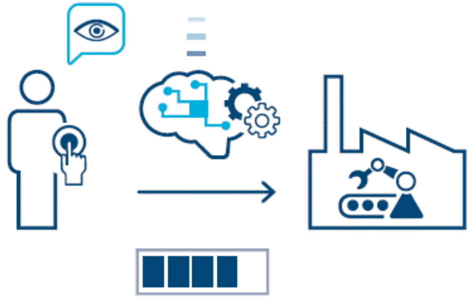
Autonomy Level 1
Assistance with respect to select functions, human beings have full responsibility and make all decisions.



Autonomy Level 2
Partial autonomy in clearly defined areas, human beings have full responsibility and define (some) goals.

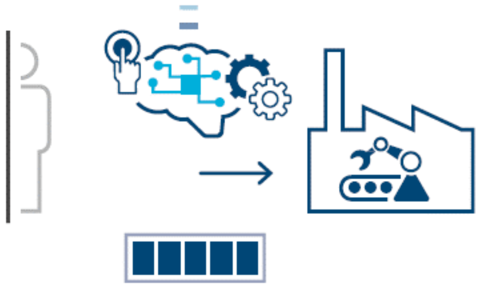


Autonomy Level 3
Delimited autonomy in larger sub-areas, system warns if problems occur, human beings confirm solutions recommended by the system or function at a fall-back level.



Autonomy Level 4
System functions autonomously and adaptively within defined system boundaries, human beings can supervise or intervene in emergency situations.

Production Level 4



Autonomy Level 5
Autonomous operations in all areas, including in cooperation and in fluctuating system boundaries, human beings need not be present.

“Trusted Digital Infrastructures”

Reliable IoT & 5G connectivity, ubiquitous edge-cloud integration, cybersecurity, data governance & transaction traceability

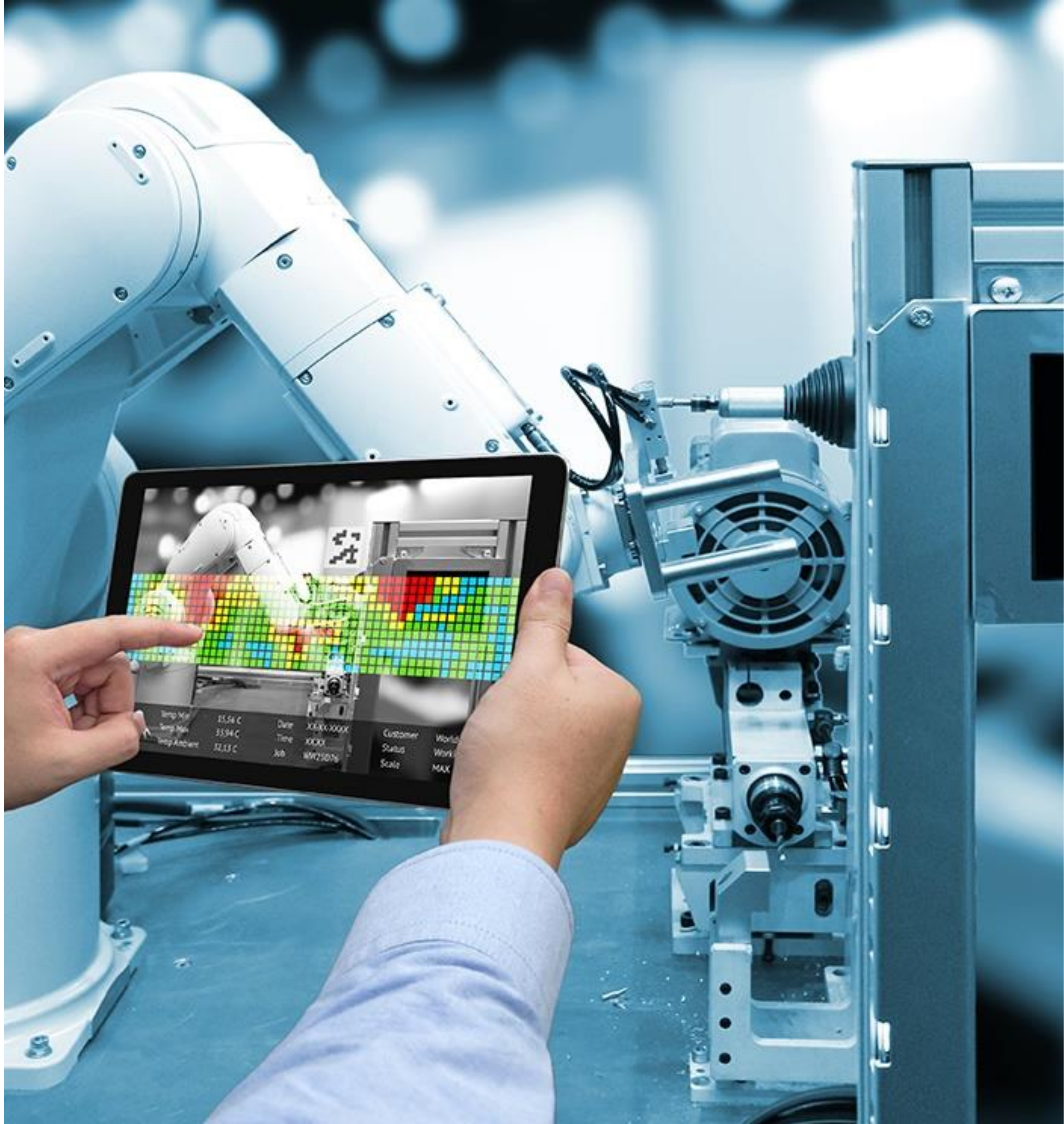
Atos · TTTech Ensuring Reliable Networks · Telefónica · ENGINEERING · AIT CENTER OF EXCELLENCE FOR RESEARCH AND EDUCATION · UNPARALLEL · OpenFog · AIOTI · HYPERLEDGER · 5G

“Plug & Control Manufacturing Equipment”

Real-time quality control, self-adaptation

+GF+ ghi SMART FURNACES FAGOR FAGOR ARRASATE PRIMA INDUSTRIE

UNIMETRIK METROLOGY AND CALIBRATION DANOBAT ASTI NXT CONTROL Schneider Electric



“AI-Powered Certified Digital Automation Shopfloors”

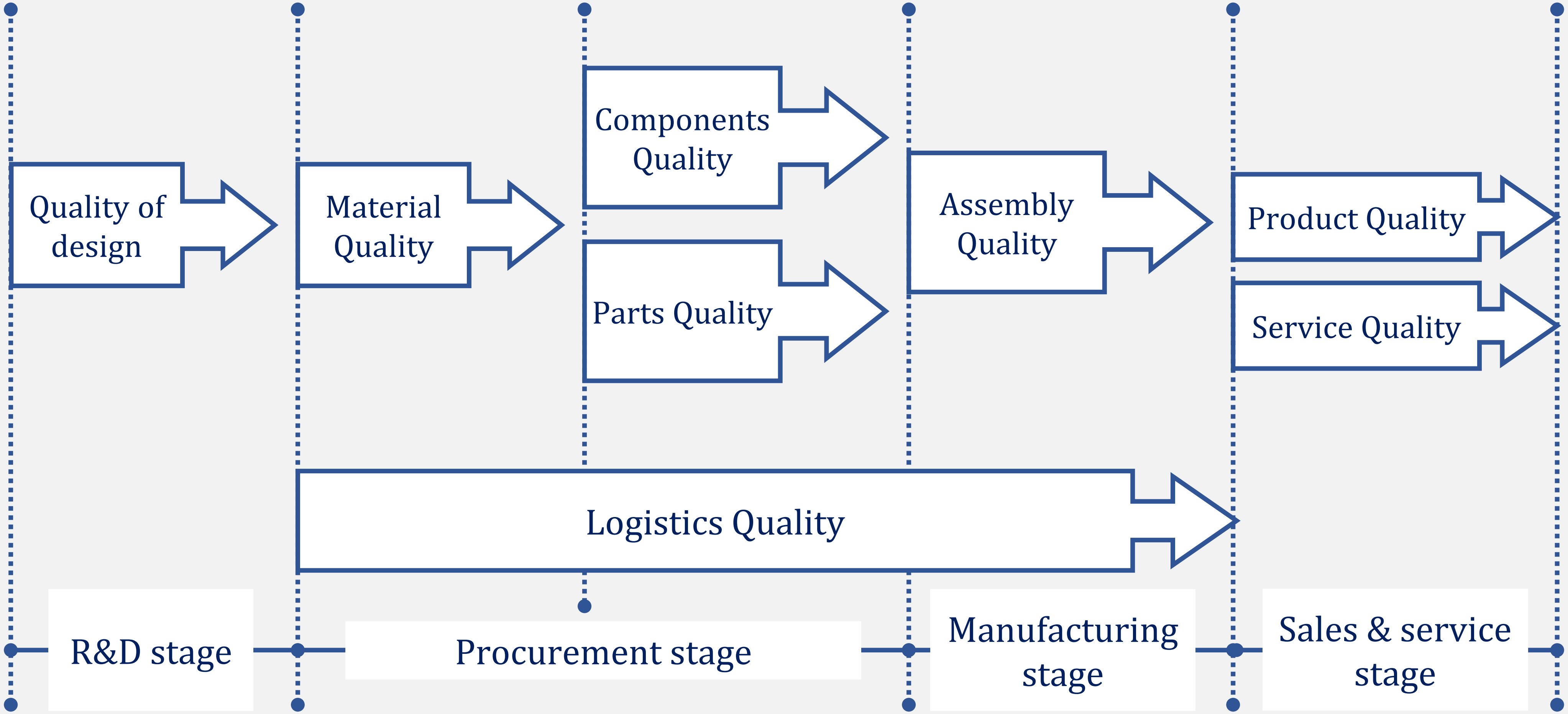
Open Big Data Pipelines, Data Sovereignty, Industrial Data Spaces, Platform Composability, Deep Analytics, Digital Twin Simulation Continuity, Augmented Decision Support.

SIEMENS | VISUAL COMPONENTS | ATLANTIS ENGINEERING | PACE

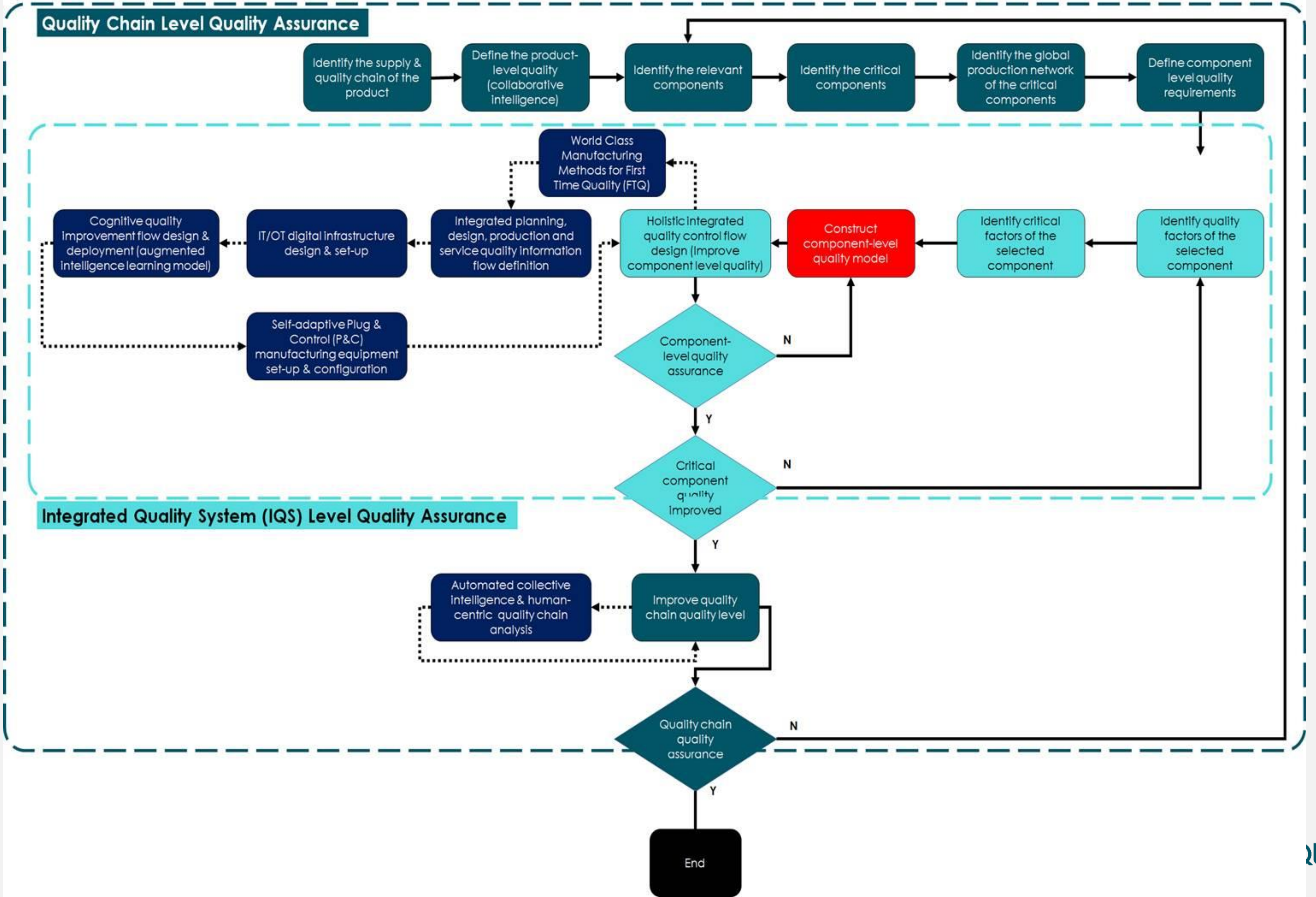
INTERNATIONAL DATA SPACES ASSOCIATION | ATB Institut für angewandte Systemtechnik Bremen GmbH | Synesis sustainable automation | SQS

Technische Universität Braunschweig | EPFL | tu technische universität dortmund | Technology Transfer System

Topics: Quality value chain



Autonomous Quality Control Model



Open call scheduling

1st Open Call

April – August 2020

Publication	Submission	Evaluation	Esperiment start (9M)
April 2020	June-Aug 2020	Aug-Sep 2020	Nov/Dic 2020

TYPE A: New Autonomous Quality Pilot

Calls for new autonomous quality pilots . The calls will invite candidates to propose novel pilots that align to the QU4LITY autonomous quality concept, notably pilots that implement features and functionalities that are not available as part of the large- scale pilots of the consortium partners.

OBJECTIVES:

Pilots should be aligned to one or both of the following two objectives/themes:

Validate the QU4LITY concept, digital enablers/technologies in areas beyond the pilots of the consortium partners: Proposers should present novel pilots in-line with the QU4LITY concept of Autonomous Quality, the QU4LITY Reference Architecture for (Digital) Zero Defect Manufacturing (ZDM).

Demonstrate end-to-end Autonomous quality in a cross-border supply Chain pilot: Proposers should present digital quality management across a supply chain i.e. beyond a single industrial plant.

Topic A1: Data Driven AI for pattern recognition in Zero Defect Manufacturing for high performance product

Pattern recognition is the process of recognizing patterns by using an Artificial Intelligence algorithm, it can be defined as the classification of data based on knowledge already acquired or on statistical information extracted from patterns or their representation. Pattern recognition is able to detect arrangements of characteristics or data that provide value information about a given system or data set.

Applicants to topic Q1 are required to design, implement and experiment data driven algorithms for pattern recognition related to Zero Defect Manufacturing for identification of defects, proactive quality control, reverse engineering for high performance products. The aim is to demonstrate the potential of this technology to improve the quality control in any of the critical point of their quality value chain and to analyse its connection and impact on the whole manufacturing process.

Topic A2: Data Driven AI in Human Machine Collaboration for Zero Defect manufacturing

Partnering with machines is integral to the future of how we live and work. A new era of intelligent systems will be characterized by trust and understanding between humans and machine. This collaboration can provide many benefits. Machines or robot can assemble and consider more data points than humans, can incorporate and often provide a less biased support to decision and improve the productivity.

Applicants to topic Q2 are required to demonstrate the potential of the human machine collaboration for quality control in manufacturing, developing autonomous learning or decision-making algorithms to improve the quality in any of the critical point of their quality value chain and analyse its connection and impact on the whole manufacturing process.

Topic A3: Integration of Data driven inline Autonomous Quality in solutions for Zero Defect Manufacturing

Traditional quality control models such as Total Quality Control, end-of-line Statistical process control or in-line multi-stage quality control solutions are not fully capable to deal with the dynamism of the Smart Factory Scenario scenarios, calling for effective support to control smart and connected production processes.

Data Driven inline Autonomous Quality solutions can deliver learning and adaptation capabilities to manufacturing companies that need to quickly scale up from small to big lot-sizes, or between different parts whilst retaining the required quality.

Applicants to topic Q3 are required to demonstrate the potential of the Data driven inline Autonomous Quality solution in highly flexible manufacturing scenarios to cover the whole quality value chain.

Topic A5: Ensuring Quality Management in supply chain trough blockchain based technologies.

Quality assurance in complex production systems is a difficult problem to tackle, given the number of parties involved in the sourcing of raw materials and parts and the extreme customization of products. Moreover, Zero Defect Manufacturing goals require that Autonomous Quality solutions are extended to the entire supply chain, possibly including logistics. This objective poses unique challenges, as it implies that some suppliers, although being autonomous businesses, are fully integrated into the control loop. Blockchain technology can help by providing a common, company-neutral data exchange infrastructure where key information can travel between all stakeholders of a process with top guarantees of provenance, integrity and transparency.

Applicants to topic Q5 are required to develop novel distributed applications to control the quality and traceability of materials and products along the supply chain and analyse their connections and impact on the whole manufacturing process.

Topic A6 Integrating ZDM solutions in Mass Customization and Lot Size One Manufacturing processes

Mass customization as a strategy that allows the production of small lots (even as small as lot size one) is becoming more and more popular and is one of the main implementations of the concept of Industry 4.0. Mass customized products, though are complex, feature a significant amount of electronics or micro-features and are composed of advanced (multi-) materials - becoming stronger, lighter and smarter whilst remaining at least as safe or secure as previous versions.

Applicants to topic Q6 are required to develop novel applications for a Zero-Defect Manufacturing through the integration of Autonomous Quality (AQ) Control Loops into Mass Customization and Lot Size One processes, using data driven technologies.

CONDITIONS:

- Proposal must address one of the topics listed in 2.3.2
- Proposed pilots should align to the QU4LITY Reference Architecture.
- Proposed pilots should use QU4LITY digital enablers/technologies presented later. Nevertheless, pilots may include technologies of the proposers as soon as they align to the QU4LITY ZDM architecture.
- Pilots and their technologies should be integrated in the project's market platform

ALLOCATED BUDGET:

- €290.000 for the funding of 4 proposals (max budget: 72.500 € for proposal)
- Each proposal must be submitted by a single applicant, consortia are not allowed.

TYPE B: Expansion of QU4LITY pilot systems

The objective of the TYPE B call is to expand the scope of existing digital platforms and pilots with new functionalities and features and address one or more challenges posed by Qu4lity pilots.

OBJECTIVES:

Proposed solutions should align to one or both of the following two objectives/themes:

Validate the expandability of the QU4LITY digital platforms: Proposers should propose and implement extensions to the QU4LITY technologies, notably to the QU4LITY platforms used in the project's pilots.

Complement existing pilots and platforms with added-value features and functionalities: Proposer should propose extensions to existing pilot systems to address specific challenges posed by the pilot

Solutions should contribute to:

Expanding the QU4LITY ecosystem and broadening the solutions QU4LITY portfolio in the market platform: Proposers should describe their solution and how it will be made available through the QU4LITY market platform and Virtualized Innovation Hub.

CONDITIONS:

Solutions should align to the QU4LITY Reference Architecture.

Solutions must addressing challenges raised by the Qu4lity extend existing QU4LITY Digital Platform or Pilots addressing challenges raised by the pilots

ALLOCATED BUDGET: € 75,000 for the funding of 1 proposal (max budget: 75.000 € for proposal)

Each proposal must be submitted by a single applicant, consortia are not allowed.

Eligible costs

- Personnel Costs
- Equipment Costs
- Travel expenses
- Software licenses
- Subcontracting
- Indirect cost (25% of direct costs)

SMEs will receive as funding max 70% of the costs

Deliverables

Status of development	Timing	TYPE A Deliverables	TYPE B Deliverables
Pilot Maturity Level 1	M2	• Proof of concept • Alignment with the reference architecture • Alignment with the Qu4lity Autonomous Quality concept • M2 cost statement	• Proof of concept • Alignment with the Qu4lity Autonomous Quality concept • Integration strategy in the reference pilot • M2 cost statement
Pilot Maturity Level 2	M7	• Complete development of the pilot • Demo and dissemination material (video, ppt) • Participation to demo event organized by the consortium	• Complete development and integration in the Q of the pilot • Demo and dissemination material (video, ppt) • Participation to demo event organized by the consortium
Pilot Maturity Level 3	M9	• Business model • Integration in the Quality marketplace • Business Plan • M9 cost statement	• Business model • Integration in the Quality marketplace • Business Plan • M9 report

Qu4lity Reference Architecture

Angelo Marguglio - Engineering

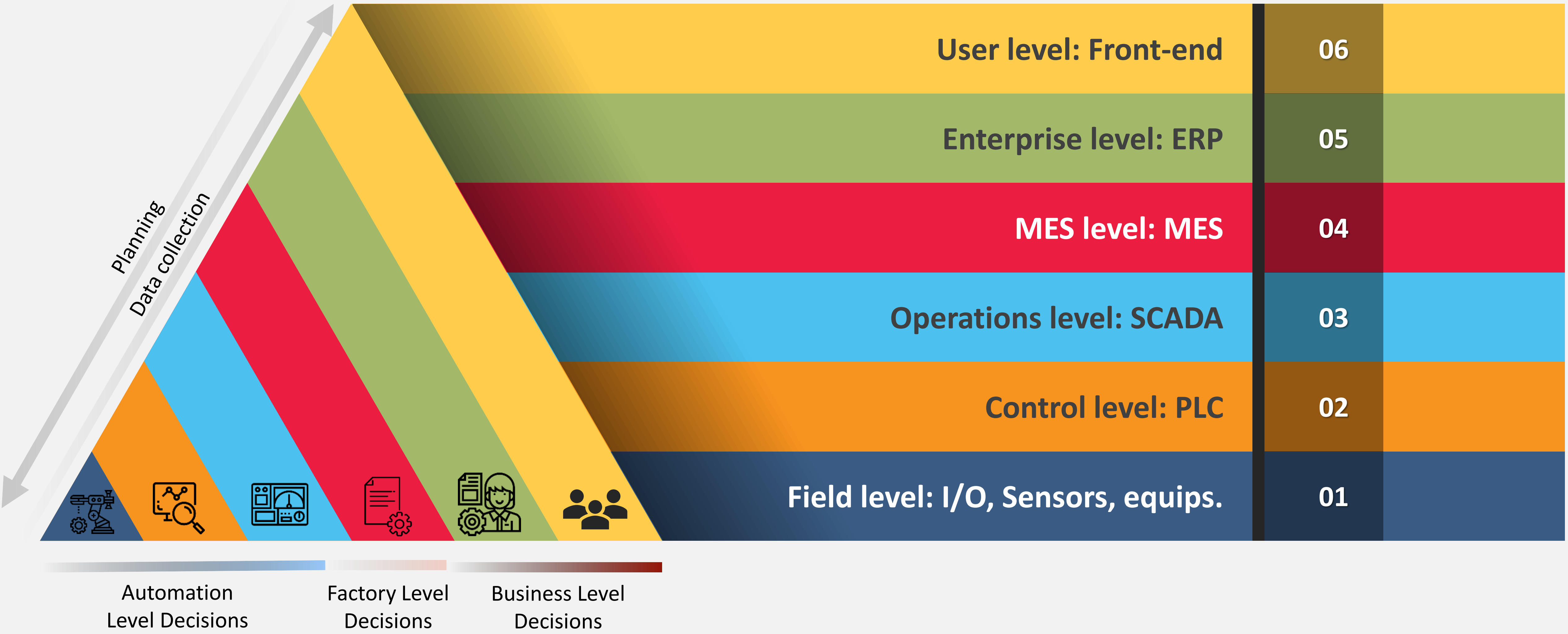
QU4LITY AI-powered Decision Workflow & Control Loops

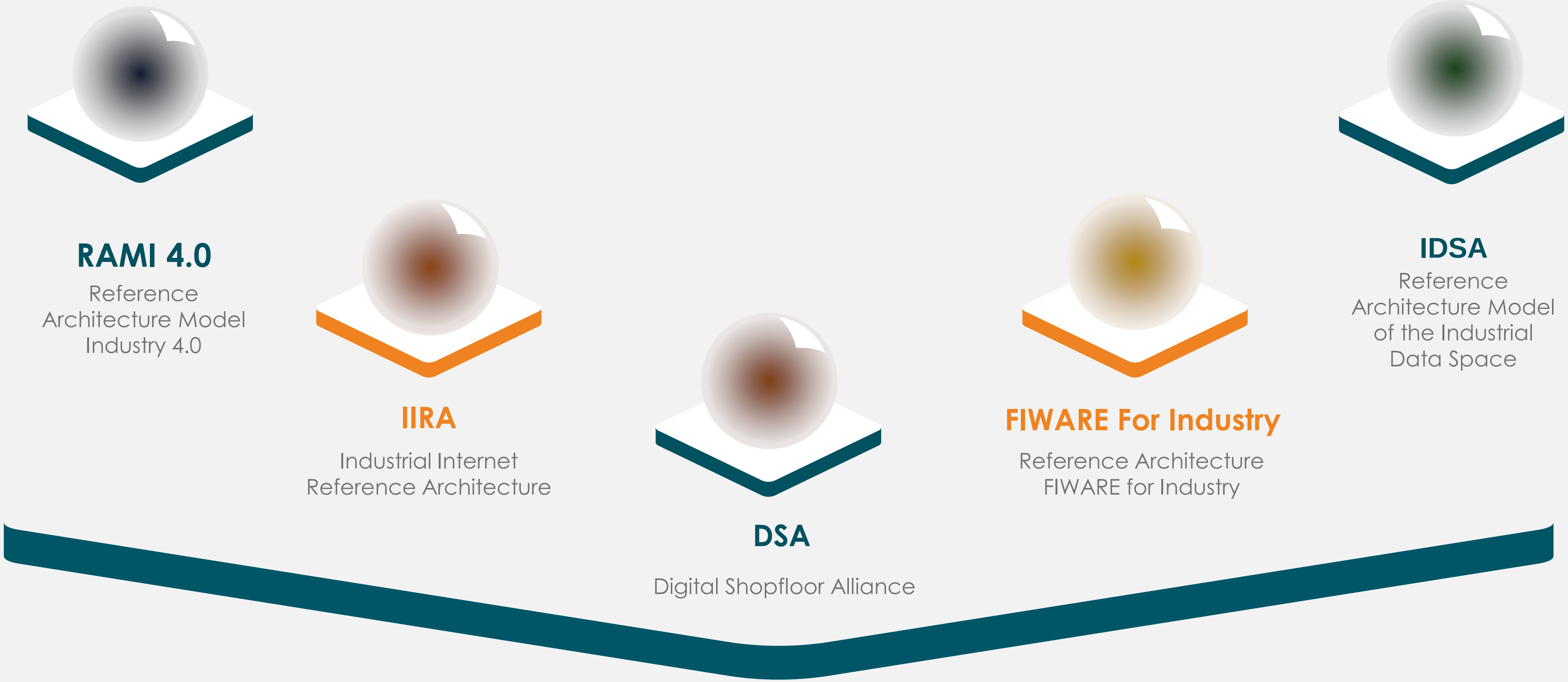

1. Trusted Digital Infrastructures


2. Plug &
Control
Manufacturing
Equipment


3. AI-Powered Certified Digital
Automation Shopfloors

Autonomous Factories 4.0: ZDM Decision & Control Workflows (Data Flows)



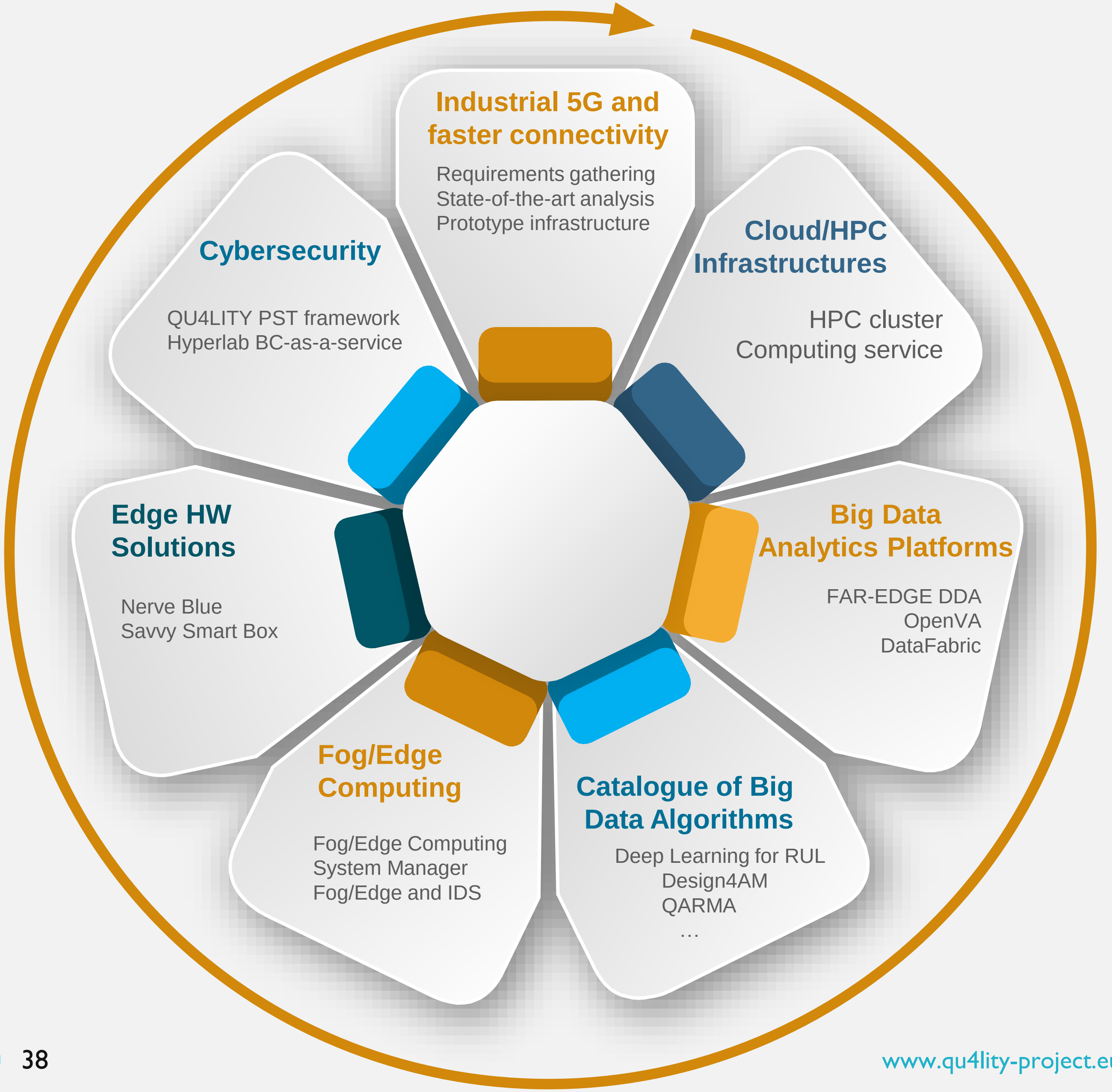


QU4LITY Reference Architecture (Q-RA)

Based on reference open implementations and standards:

EFFRA · FIWARE Foundation · BDV Big Data Value Association · 4ZDM Zero Defect Manufacturing · Digital Shopfloor Alliance · ConnectedFactories

ENGINEERING

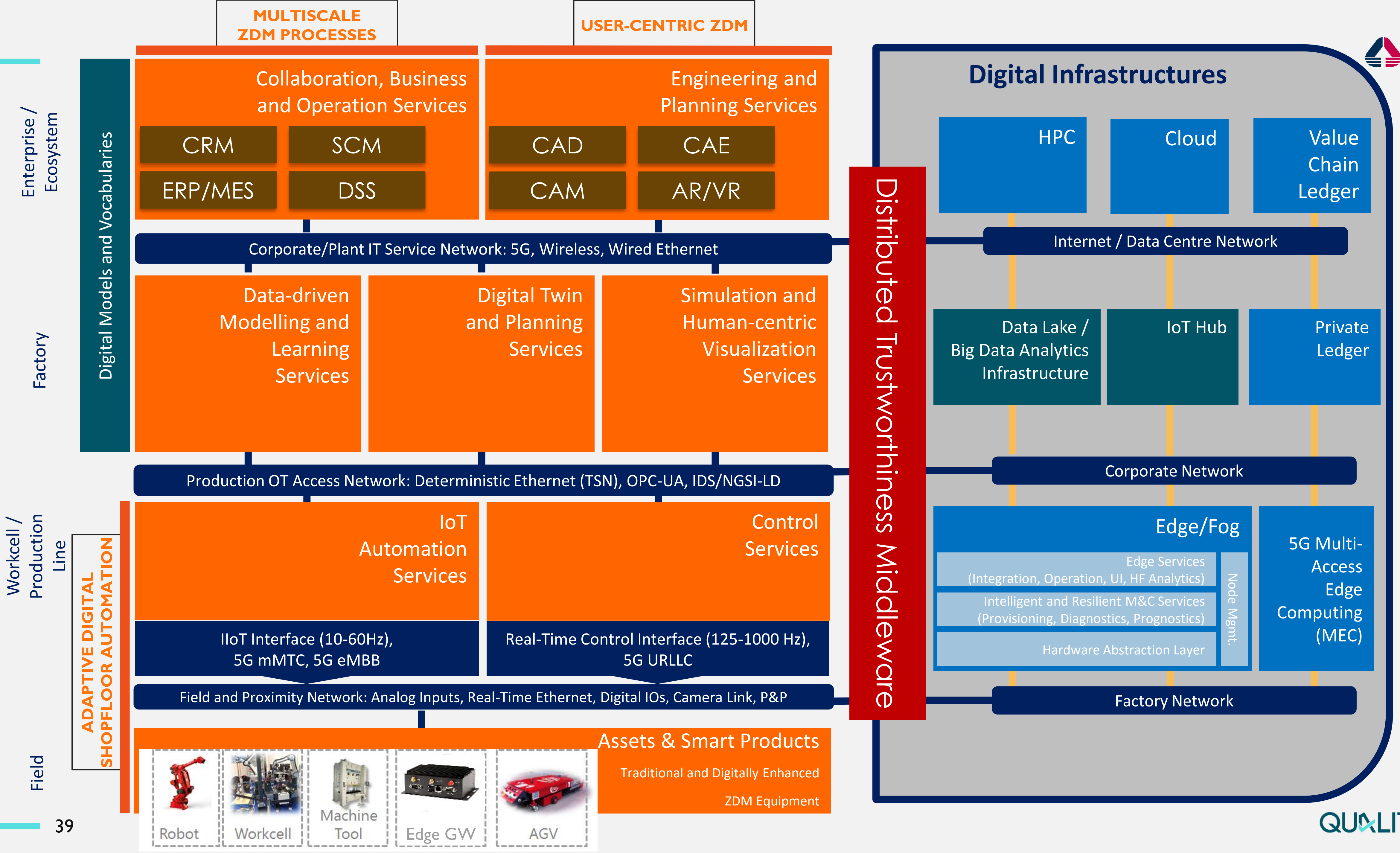


Networking4AI
Industrial Networks
4G Private LTE / Industrial 5G

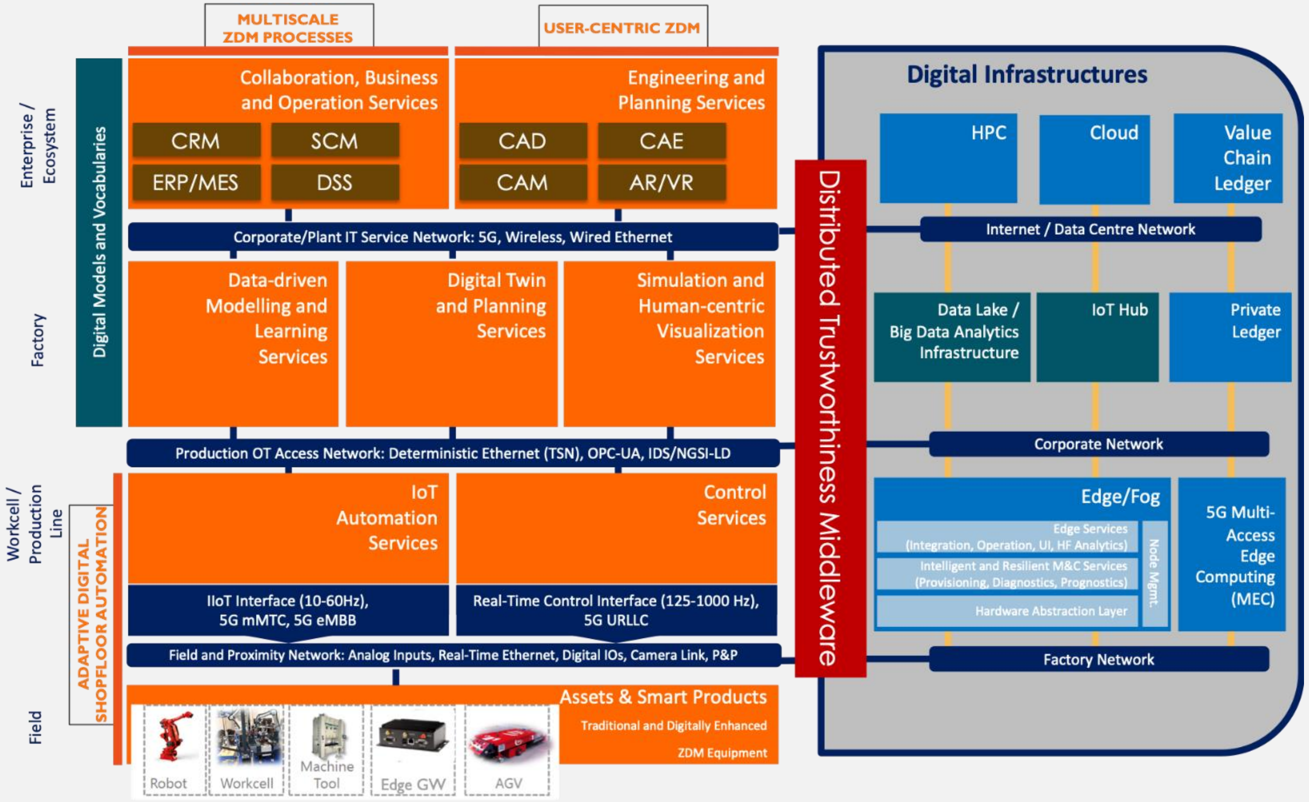
Edge4AI
Fog/Edge Computing
Industrial IoT
Edge nodes
Distributed learning

Cloud4AI
Cloud / HPC
Scalable and secure Data Center
Big Data analytics and algorithms

Security4AI
Cybersecurity
Decentralized Ledgers
Smart Contracts

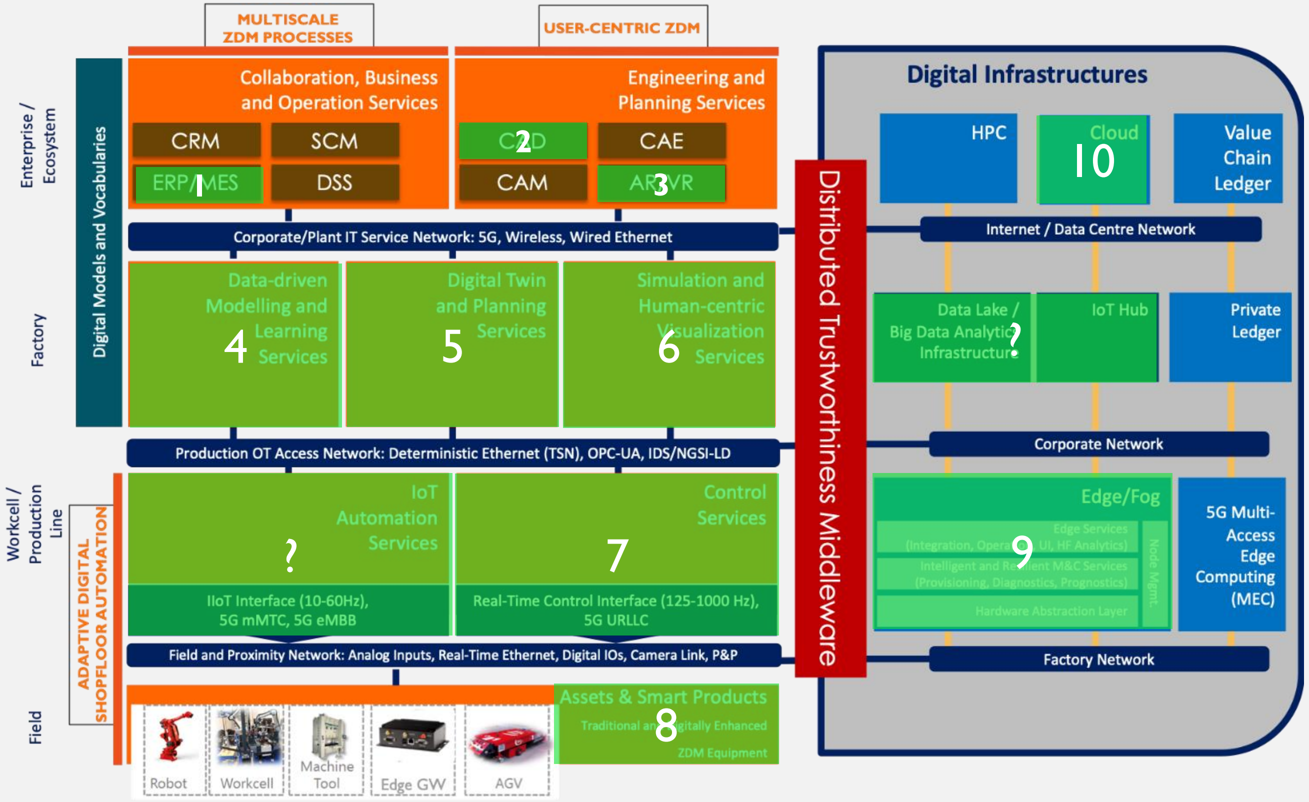

MULTISCALE ZDM PROCESSES
USER-CENTRIC ZDM
Enterprise / Ecosystem
Factory
Workcell / Production Line
Field
Digital Models and Vocabularies
ADAPTIVE DIGITAL SHOPFLOOR AUTOMATION
Collaboration, Business and Operation Services
CRM
SCM
ERP/MES
DSS
Engineering and Planning Services
CAD
CAE
CAM
AR/VR
Corporate/Plant IT Service Network: 5G, Wireless, Wired Ethernet
Data-driven Modelling and Learning Services
Digital Twin and Planning Services
Simulation and Human-centric Visualization Services
Production OT Access Network: Deterministic Ethernet (TSN), OPC-UA, IDS/NGSI-LD
IoT Automation Services
Control Services
IIoT Interface (10-60Hz), 5G mMTC, 5G eMBB
Real-Time Control Interface (125-1000 Hz), 5G URLLC
Field and Proximity Network: Analog Inputs, Real-Time Ethernet, Digital IOs, Camera Link, P&P
Assets & Smart Products
Traditional and Digitally Enhanced ZDM Equipment
Robot
Workcell
Machine Tool
Edge GW
AGV
Distributed Trustworthiness Middleware
Digital Infrastructures
HPC
Cloud
Value Chain Ledger
Internet / Data Centre Network
Data Lake / Big Data Analytics Infrastructure
IoT Hub
Private Ledger
Corporate Network
Edge/Fog
Edge Services (Integration, Operation, UI, HF Analytics)
Intelligent and Resilient M&C Services (Provisioning, Diagnostics, Prognostics)
Hardware Abstraction Layer
Node Mgmt.
5G Multi-Access Edge Computing (MEC)
Factory Network

Mapping of OC experiment towards QU4LITY RA



- How to perform the mapping:
  - A. Which components of the OC experiment are related to processes/components of the Q-RA?
    (Please also list components that can not be mapped to the RA properly)
  - B. Please describe the OC experiment components with more details.
  - C. What interoperability standards and data exchange formats are used at the interface of these components?

ENGINEERING



- **How to perform the mapping:**
  - A. Which components of the OC experiment are related to processes/components of the Q-RA?
    (Please also list components that can not be mapped to the RA properly)
  - B. Please describe the OC experiment components with more details.
  - C. What interoperability standards and data exchange formats are used at the interface of these components?

Qu4lity Enablers: Qarma

John Soldatos - Intrasoft

What is QARMA?

- INTRASOFT's Machine Learning Framework for Data Mining of Large Industrial Data sets
- High-Performance & Able to Identifying Rare Events (e.g., Machine Failures)
- Already Validated in Various EU Projects (e.g., PROPHESY, QU4LITY) and Real-Life Industrial Use Cases

Main Principles:

- Mining of rules in multi-dimensional datasets where the features in the dataset are in general numerical vectors of varying lengths per feature.
- QARMA operates in parallel using as many cores as there are available in a cluster of machines that can have hundreds of machines connected to it.

Added value of the selected algorithm:

- Extract high-confidence rules on industrial datasets, even for events that occur rarely
- Provide explainable representations of the knowledge that boosts transparency and acceptance by stakeholders (e.g.. Plant Managers, Maintenance Engineers, Quality Engineers)

Scenarios of Use (Two steps process):

- **Input:** A manufacturing company must provide a dataset containing sensor measurements from one or more of its production machines and/or tools configured on those machines along with information about tool breakages and parts made since last breakage using a particular tool.
  - The dataset can be arbitrarily large, but cannot be arbitrarily small.
  - A few thousand datapoints are needed for the models to be properly trained.
  - Sparse datasets (few non-empty data attributes per instance) are likely better suited to the enabler than fully dense datasets (that are usually artificially created).
- **Output:** The QARMA family of algorithms will run and the output predictions of the overall model will be made available via a REST API described immediately below.

Accessing the Enabler:

- A REST API on an INTRASOFT Intl URL will be defined and made available to the Open Call winner that will opt for using QARMA

QARMA related Publications

- I.T. Christou, N. Kefalakis, A. Zalonis, J. Soldatos, "Predictive and Explainable Machine Learning for Industrial Internet of Things Applications", IEEE Distributed Computing on Sensor Systems Conf., Workshop on IoT Applications and Industry 4.0, June 15-17, 2020.
- I.T. Christou, N. Kefalakis, A. Zalonis, J. Soldatos, R. Bruchler, "End-to-End Industrial IoT Platform for Actionable Predictive Maintenance", 4th IFAC Workshop on Advanced Maintenance Engineering, Services and Technologies, Cambridge, UK, Sep. 10-11, 2020
- I.T. Christou, "Avoiding the Hay for the Needle in the Stack: Online Rule Pruning in Rare Events Detection", IEEE Intl. Symp. On Wireless Communication Systems, Special Session, IoT in Energy Systems & Industrial Environments, Oulu, Finland, Aug. 27-30, 2019.
- I.T. Christou, E. Amolochitis, Z.-H. Tan, "A Parallel/Distributed Algorithmic Framework for Mining All Quantitative Association Rules", arXiv preprint arXiv:1804.06764, Apr. 2018
- J. Soldatos and Ioannis T. Christou, "IoT Analytics: From Data Collection to Deployment and Operationalization", in J. Soldatos (ed.) "Building Blocks for IoT Analytics", River Publishers, 2016.

Contacts & More Information

- Dr. Ioannis T. Christou, Ioannis.Christou@intrasoft-intl.com
- Dr. John Soldatos, Ioannis.Soldatos@intrasoft-intl.com

Qu4lity Enablers:
Rule Metrics

Ifigenia Metaxa - Atlantis

What is the Remaining Useful Life?

- RUL metric: length from now to the end of the useful life of an asset.

What is the end of useful life of an asset?

- literal meaning,
- damage of asset,
- violation of the standard quality of the end product.

RUL analysis (regardless of definition)

- provides information on deterioration rate of equipment,
- enables informed planning of maintenance activities,
- minimizes negative impact on productivity,
- contributes to the avoidance of quality issues in the manufacturing plant.

What does RUL enabler do?

- estimates the RUL of the equipment until the next hardware or quality failure
- gives time to schedule stops, avoid major failures and reduce downtime

How?

- advanced data-driven approach for RUL estimation of critical components based on deep learning (i.e. Long Short-Term Memory (LSTM) algorithm) and Complex Event processing (CEP)
- relies on historical data for training of LSTM models
- relies on real-time data for online evaluation of RUL

Added value of the selected algorithm?

- identify relationships both among various sensor measurements and from different points of time,
- CEP to identify product cycles to train models capable of reporting reliable time-independent results.

How can you use it?

For which Applicants is this solution suitable? Do you have?

- Real-time sensor data,
- Historical data,
- Log files with previous hardware or quality faults (Fault and timestamp),
- Correlation between faults and signal (nice to have),

What will you get?

- dockerized solution (deployable either on premises or on a remote location),
- default parametrisations for model training,
- custom solutions built through mentoring,
- generic approach for data fetching,
- custom data transfer bridges can be developed with any available data handling system,
- improved quality of produced parts and critical points of value chain,
- access to failure logs from the shop-floor is expected.

What benefits can you expect?

- Reduction of operation and maintenance costs
- Increase of productivity
- Increase of Remaining Useful Life
- Reduction of downtime
- Increase of MTBF (Mean Time Between Failures)
- Reduction of MTTR (Mean Time To Repair)

Overall

- estimation on when the next failure is predicted with an adequate level of uncertainty,
- optimise production schedule and maintenance schedule,
- avoid failures and breakdowns,
- improve availability of equipment and production lines,
- improve health of machines,
- avoid deterioration of machines with preventive rather than with corrective actions.

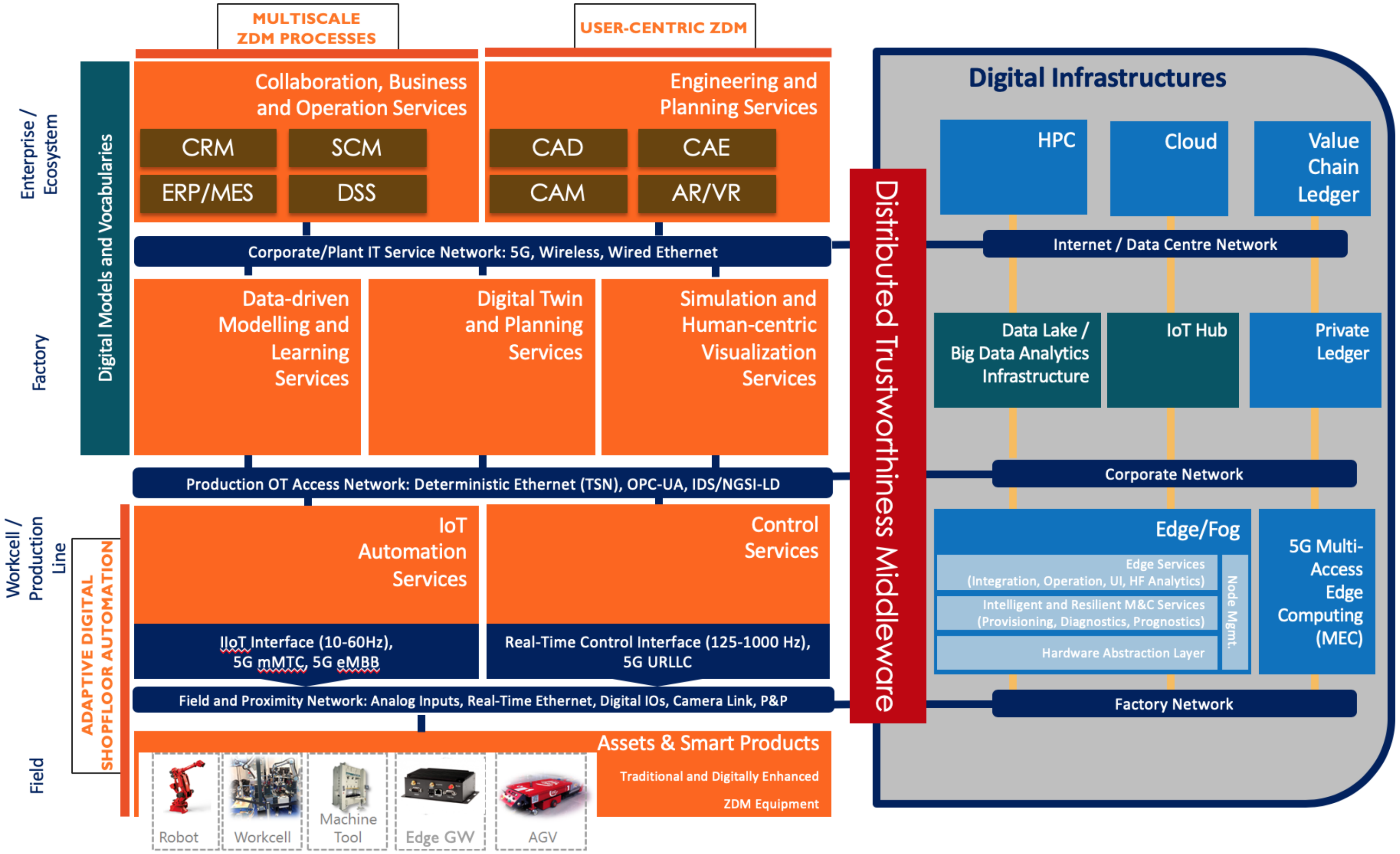
Qu4lity Enablers: Blockchain Infrastructure

Mauro Isaja - ENG

Context

In the QU4LITY Reference Architecture, the DLT Infrastructure is referred to as the Value Chain Ledger (VCL) and also as Private Ledgers (PL).

The VCL is a single common facility used by multiple organizations that belong to the same business ecosystem, while the PL term refers to any private Blockchain instance deployed internally to a specific organization, with no information shared with the outside world.



Context

The use of Blockchain in QU4LITY enables secure state sharing and synchronization of distributed industrial processes involved in ZDM. For instance, *smart contracts* can improve agreements management between manufacturers, customers and other stakeholders in a supply chain.

From the perspective of ZDM applications, there are two important categories of functionality that smart contracts can enable:

- Decentralization of control: processes with multiple autonomous actors can be run safely without the supervision of an authority.
- Trustworthy tracking of events: despite the lack of a central repository, everything written on a Blockchain by a smart contract cannon be altered or removed. Adding digital identities and signatures to the picture results into a system of record that enforces *nonrepudiation*.

DLT Services

A DLT Service is a smart contract deployed on the common VCL instance, plus the client software used by applications to connect and interact with it.
The QU4LITY library of DLT Services provides generic ZDM functionality that runs on the VCL and can be used – on request – by any QU4LITY partner:

- **Quality Clearing House** (QCH) enables a decentralized workflow for quality management in supply chain scenarios.
- **Decentralized Analytics Engine Configuration** (DAEC) enables secure and tracked distribution of data processing directives in a distributed data analytics system based on Edge Computing.
- **Secure Analytics Results Publishing** (SARP) enables the edge nodes of a distributed data analytics system based on Edge Computing to share their "local" results on the DLT Infrastructure, thus contributing to a common data set representing the combined results across the entire network.

Example: the Quality Clearing House

QCH provides a common system of record for a manufacturing ecosystem where actors need to continuously assess the quality of raw material, parts and final products and match the results against contractual standards that may change frequently.

0. Company A is the manufacturer of a final product. Company B is a manufacturer of parts. Company C provides some “smart” metrology equipment that is deployed by Company A.

1. **A** defines the quality standard of the supply chain and configures the QA plan: a *Quality Assessment Model* record is published on the ledger.

2. **B** ships a batch of parts: a *Shipping Unit Manifest* record is published on the ledger.

3. **A** receives and processes the shipment: a *Quality Assessment Report* record is published on the ledger by the metrology smart equipment, on behalf of **C**.

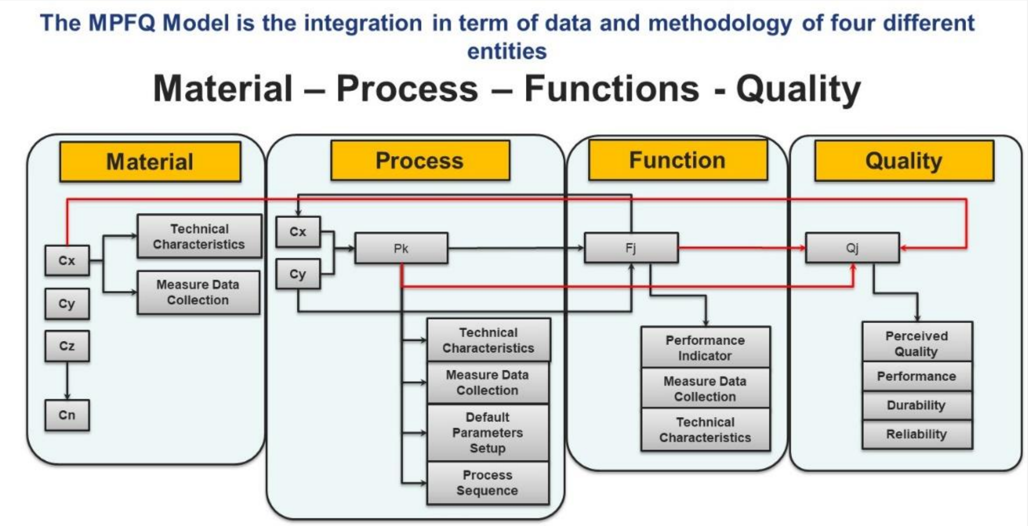
4. When payment to B is due, **A** applies any penalties and discounts defined in the plan for missed quality targets, as documented by the ledger.

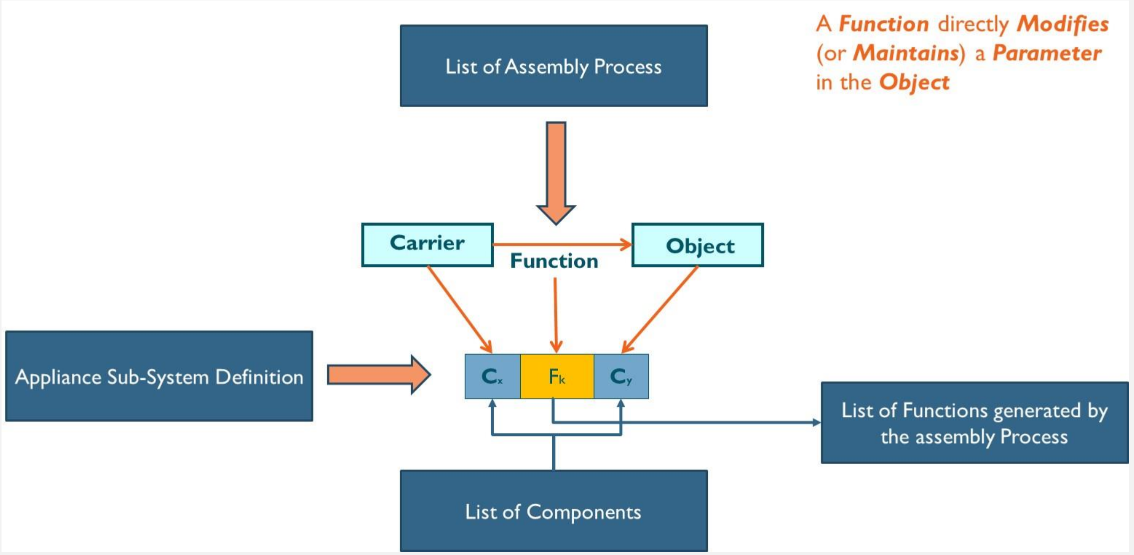
(5.) Optionally, **A** may pay C for the actual usage of its equipment, as documented by the ledger.

Type B Call Challenge

Pierluigi Petrali, Claudio Turrin
Whirlpool

Type B: Challenge





BASIC features of graphical tool

- Edit the functional model of a system of components and store the result of the graph in a machine readable format. The graph consist in two type of elements: materials and external entities (represented by rectangles and hexagons) and functions, represented by named arrows.
- Edit the Process Map of a production system using IDEF-0 or other suitable standard representations
- Associate each Function mapped with a specific process step
- Define a set of Quality performances and associate them to a set of components, functions, process

Qu4lity Market Platform

John Soldatos - Intrasoft

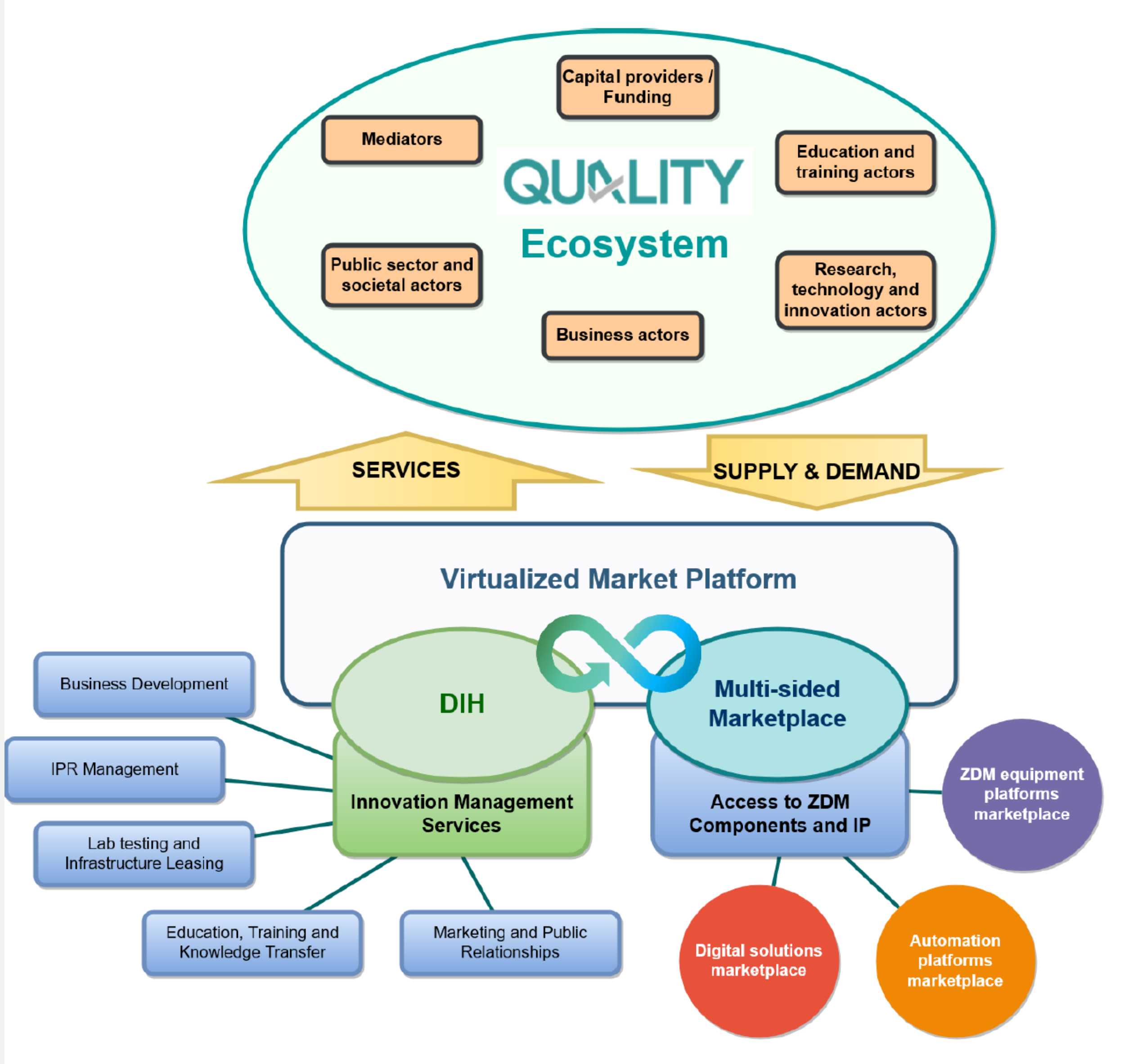
QU4LITY Market Platform Concept & Services

Market Platform & QU4LITY Results

- Single Point of Access to QU4LITY Results, notably ZDM related market-ready IP
- Examples:
  - Machine Learning Algorithms
  - BigData Analytics Middleware Platform
  - Enablers for Semantic Interoperability

Market Platform & Innovation Management Services

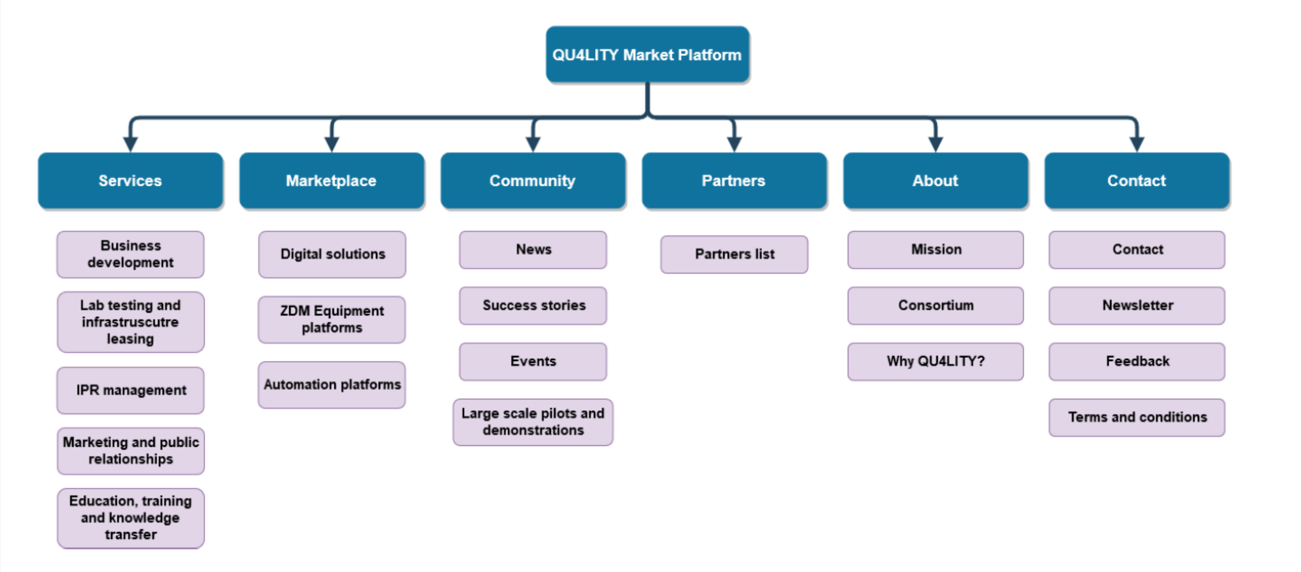
- Single Point of Access to QU4LITY Innovation Management Services
- Virtualized Digital Innovation Hub Concept
- Examples:
  - Access to Experimental Facilities (Testbed)
  - Training & Education Services
  - Support for Business Case Development

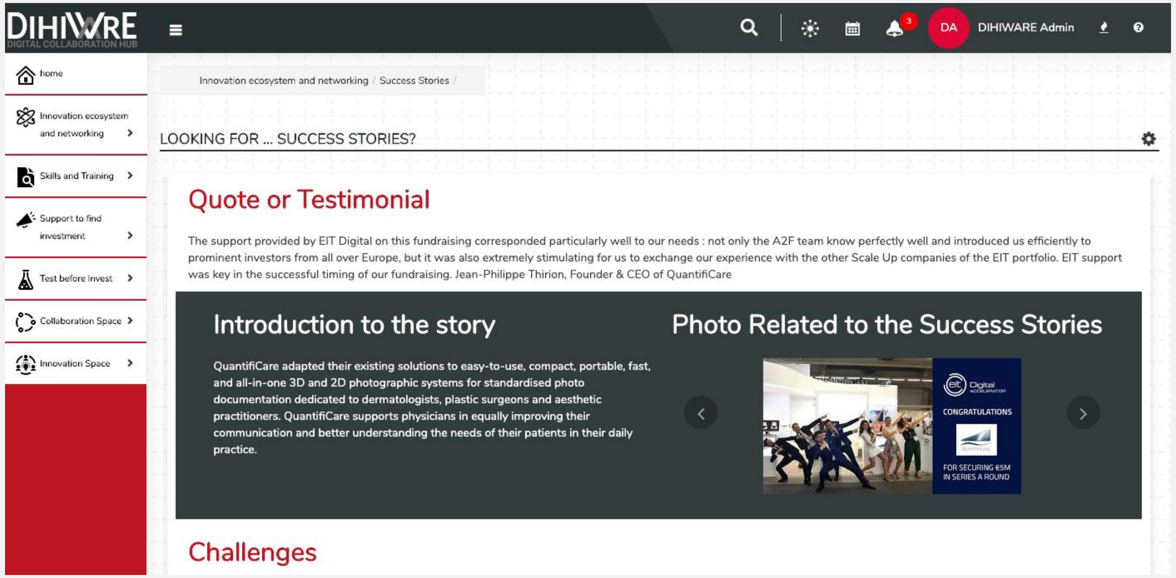


QU4LITY Market Platform: Implementation & Information Structure

Market Platform Implementation

- Implemented Over Existing Portal Platforms & IP Catalogues (i.e. IoT Catalogue, DIHIWARE)
- Information Architecture & Content Structure Available
- Alpha Version of Platform Available (Public Launch Expected in July 2020)





Open Call Proposer should:

- Describe the results that will be made available in the QU4LITY Market Platform
- Follow instructions and mandates listed in the Open Call Text
- Examples:
  - Digital Enablers: ML Algorithms, Data Platforms etc
  - Turn-Key ZDM Solutions
  - Open Datasets
  - Methodologies / Blueprints e.g., Quality Management / ZDM Methodologies

Open Call Winners should:

- Integrate the results in the QU4LITY Market Platform
- Prepare Relevant Content, including:
  - Market Level Description of the Results
  - Package for the Distribution of the Results (e.g., Docker Image)
  - Other Relevant Documentation (e.g., Samples, Presentations, Manuals)
- Register with the Market Platform and help QU4LITY grow its community

Open Call Winner Maintain the Ownership of their results

- QU4LITY partners won't claim IP of foreground developments carried out in the scope of Open Call Experiments
- They will however retain the background that might be used for developing the experiment
- Market Platform integration does not imply any obligation for sharing IP with QU4LITY partners
- Market Platform is (yet another) promotional channel for the dissemination and exploitation of the market-ready results of the Open Calls
- Open Calls Winners are expected to use it as much as possible
- Win-Win benefits with the QU4LITY Consortium
- **Conclusion**: Proposers should not hesitate to propose ideas that will enhance the value of the Market Platform and will help building the QU4LITY Community

QU4LITY

Thank you for your attention !!

Qu4lity

@EuQu4lity

www.QU4LITY-project.eu

Co-funded by the Horizon 2020 Programme of the European Union. Grant agreement ID: 825030