Intra-logistics process planning powered by simulation
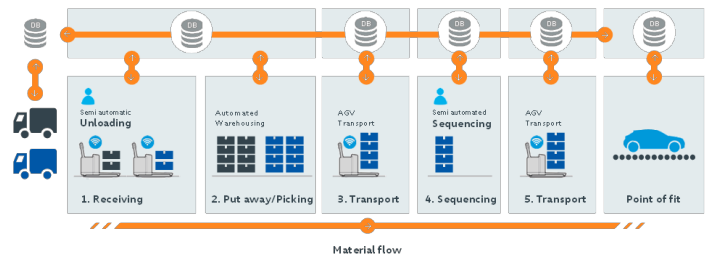
The initiative from Boost 4.0 ties with the Volkswagen brand's TRANSFORM.TOGETHER production strategy.

The new TRANSFORM.TOGETHER production strategy with its eight central action areas lays down the roadmap for leveraging existing efficiency potential and achieving a sustained increase in productivity.

This strategy has defined eight main action areas containing concrete measures to drive the progress of the production strategy at all Volkswagen sites: productivity, team of the future, rework-free products and processes, sustainable structures, stable sales order process, ramp-up excellence, low-expenditure factories of the future and Think Blue.Factory.

THE LOGISTICS OF THE FUTURE WILL BE #NETWORKED, #FULLY AUTOMATED, #TRANSPARENT AND #EFFICIENT WITH #PREDICTIVE AND #ADAPTIVE FUNCIONALITIES.

LOGISTICS 4.0 PROCESS FLOW.

Semi automatic Unloading	Automated Warehousing	AGV Transport	Semi automated Sequencing	AGV Transport	Point of fit
1. Receiving	2. Put away/Picking	3. Transport	4. Sequencing	5. Transport	

Material flow

SMART PLANNING & MANAGEMENT.

Digital Twin modelling and simulation using Machine Learning methods

Factory 4.0 Big Data Pilot Motivation

• Lack of integration and communication between the different data silos.
• Challenging planning of the logistics processes throughout the different steps.
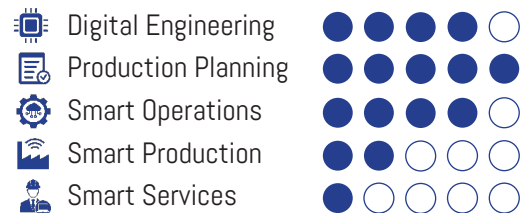• Low degree of intelligent data analytics.

Smart Planning & Management

• Increase efficiency and flexibility by simulating on a digital twin multiple scenarios before going live.
• Harvest and connect data, introduce algorithms, enable predictive and adaptive features.
• Establish the optimal logistics ecosystem.

Competitive Advantages

• Increase plant sustainability by reducing logistics costs.
• Increase efficiency with a reduction of 10% in idling time.
• 10% reduction in total cost of ownership (stock).
• 15% reduction of time to market of a new product.

Big Data Pilot Lifecycle Scope

Digital Engineering	●●●●○
Production Planning	●●●●●
Smart Operations	●●●●○
Smart Production	●●○○○
Smart Services	●○○○○

Big Data Pilot Site

Volkswagen Autoeuropa
Quinta da Marquesa 2954-024
Quinta do Anjo, Portugal

Pilot Partners

VW
Automotive Lighthouse Factory

VISUAL COMPONENTS
3D Manufacturing Simulation Software

Telefónica
Research & Development Company of the Telefonica Group
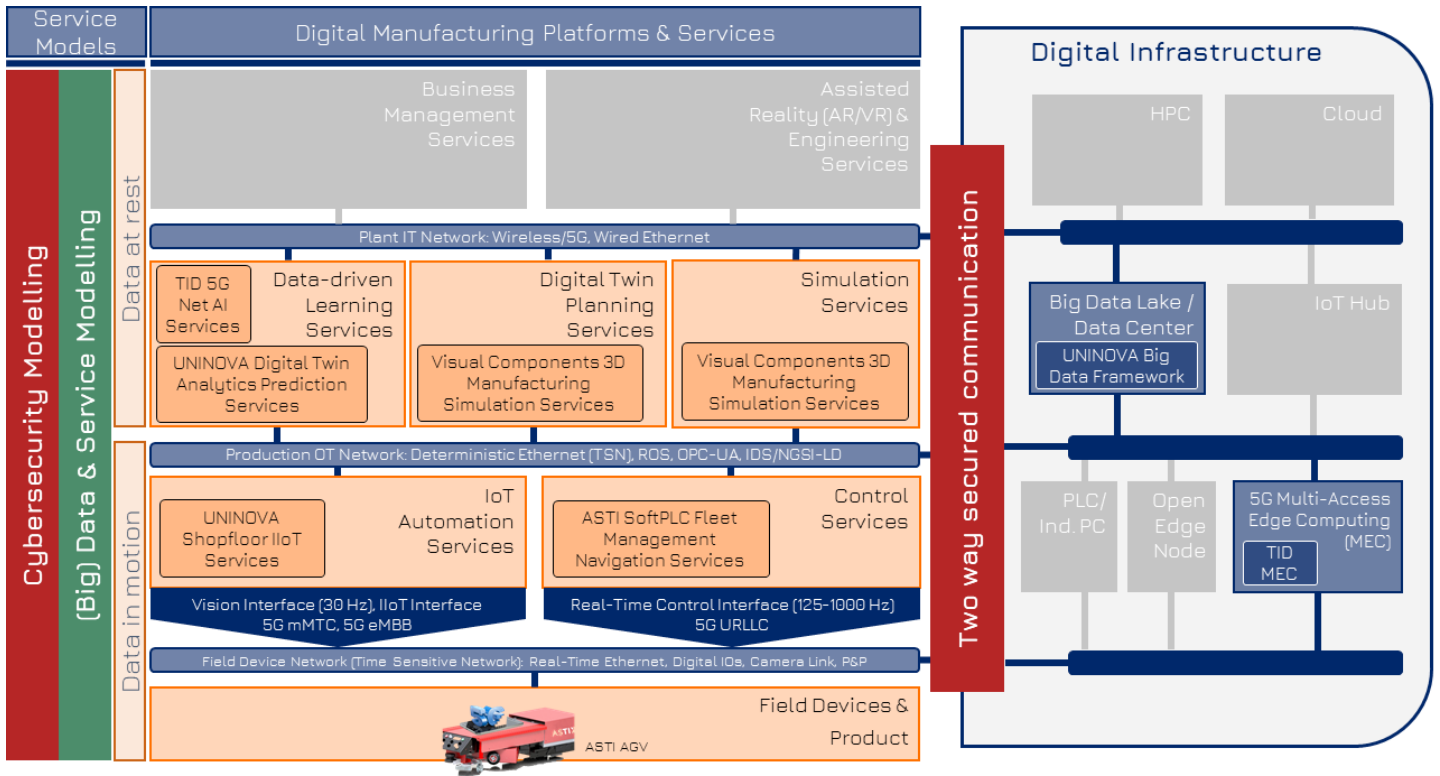
ASTI
Made to Measure Solutions for Logistics

UNINOVA
Multidisciplinary Research Institute

I4.0 Big Data Pilot Solution Framework

Boost 4.0 big data solution framework leverages on Big Data Europe (BDE) big data pipeline technologies, International Data Spaces Association (IDSA) specifications for data sovereignty, FIWARE NGSI-LD API for open IDS implementation and Hyperledger technologies for transaction traceability. Boost 4.0 big data platforms and technologies align to RAMI 4.0 and are integrated under the Digital Shopfloor Alliance (DSA) autonomous service framework to ensure reduced cost, time and effort in solution deployment and extensibility (https://digitalshopflooralliance.eu/).

I4.0 Big Data Pilot Features

Sector / Product: Automotive

Manufacturing Process: Logistics

Big Data Analytic Techniques: Machine Learning, regression analysis, classification

Big Data Platforms:
- UNINOVA Big Data Framework
- Visual Components 4.1
- Telefonica 5Tonic

IDS-FIWARE Connectors & Standards:
- 5G Technology
- Powered by IDS Big Data Apps
- FIWARE - ORION Context Broker

Open I4.0 Big Data Pilot Pillars

INTERNATIONAL DATA SPACES ASSOCIATION

IDSA defines a reference architecture and an ecosystem, which supports sovereign exchange and sharing of data between industrial partners.

FI-WARE

FIWARE is a curated framework of open source platform components to accelerate the development of smart solutions for Industry 4.0.

HYPERLEDGER

HYPERLEDGER is an open source collaborative effort created to advance cross-industry blockchain technologies.

BIG DATA EUROPE
Empowering Communities with Data Technologies

The BDE offers an open source platform, allowing to build several Big Data components into a pipeline through a simple graphical UI.

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