

DI4TEX

Fostering the digital transformation
in the textile industry



www.di4tex.eu

The textiles and clothing manufacturing sector in Europe is facing several challenges; owing to the financial crisis, the competition from emerging markets, the environmental demands, etc., and the crisis generated by COVID-19.

The sector, one of the largest and most important in Europe, needs to reassess its position by assuming the two drivers of competitiveness: **green transition and digital transformation.**

The main objective of DI4TEX is to foster the digital transformation of the textile industry by providing its employees with the required skills to face the current challenges of the sector.



Topic 03: Data Acquisition and Visualisation

DI4TEX

Disclaimer

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Acknowledgement

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Data Sources

- Data -> Information-> Knowledge -> Intelligence
- Goal - Data Driven Decision Making

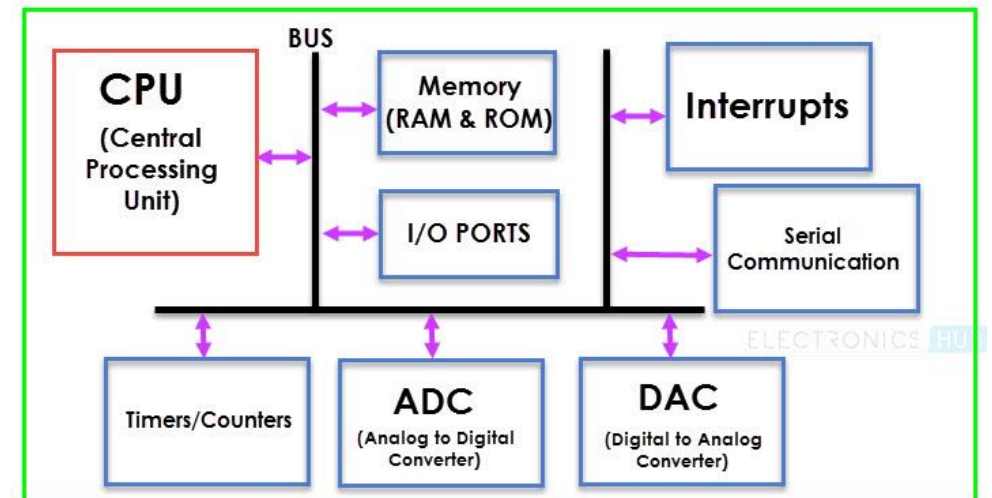


Data Sources

- Data Sources in Manufacturing
 - People – manual entry, logging, reporting, analysis
 - Orders – customer id, time placed, customisation, delivery, weight
 - Products/Parts – quantity, type, location, batches
 - Machines – run/cycle/down – time, parameters,
 - Processes/Technical Services – levels, availability,
- Manufacturing Data is generally time-series datasets – often with limited granularity – i.e. batch data / machine log time.
- Manual entry data is often incomplete / incorrect

Embedded Electronics

- Sensors – Digital/Analog
- Vision systems, metering systems, load cell
- Motor controller, electro-pneumatic valves
- Numeric Controllers
- Programmable Logic Controllers (PLCs)
- Cyber-Physical Systems (CPS / CPPS)
- Embedded Board (Raspberry Pi)
- Single-board / Edge Computer
- Internet of Things (IoT)
- Industrial IoT – IIoT



IIoT



- Open Source
- Low cost
- Free software
- Easier Programming
- Useful for temporary data gathering
- Limited memory
- Excellent connectivity
- Access to good data analytic tools
- Not common in manufacturing
- Not Industry Hardened

PLCs

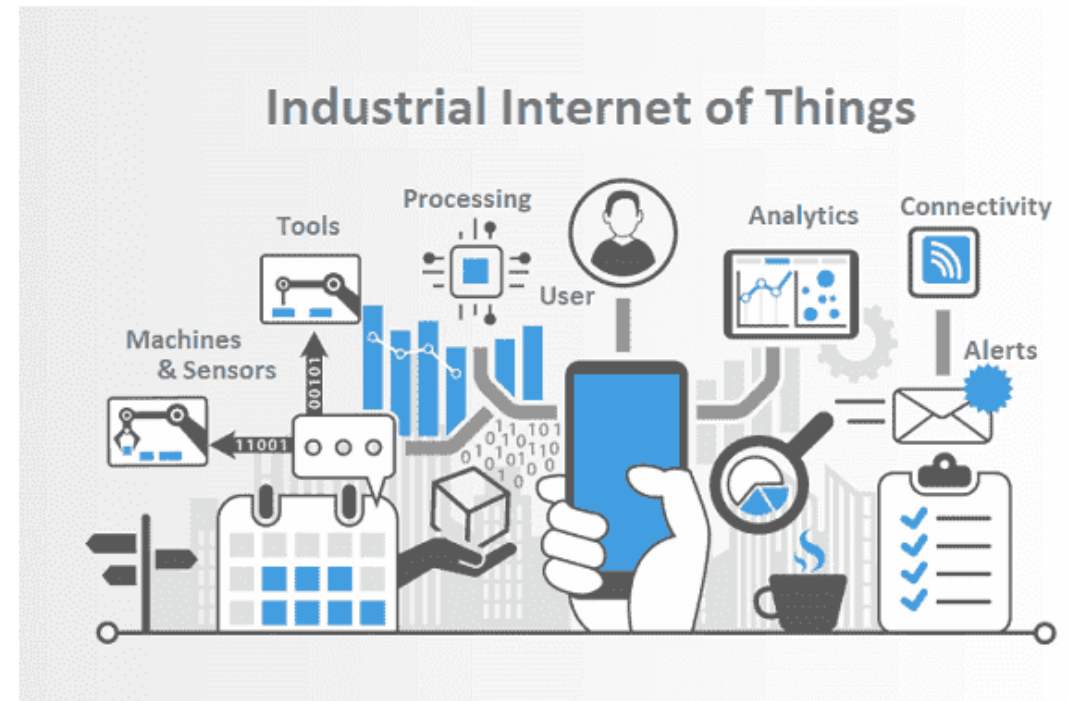


- Closed Operating System
- Higher cost
- Proprietary /expensive software
- Specialist Programming
- Useful for long term monitoring and control
- Limited memory
- Limited range of connectivity
- Limited data analytic tools
- Very common in manufacturing
- Proven Industry hardened

IIoT in Manufacturing

- Application Areas
 - Quality Management
 - Logistics and supply chain
 - Inventory management
 - Facilities management

- Production - ?
- Automation - X

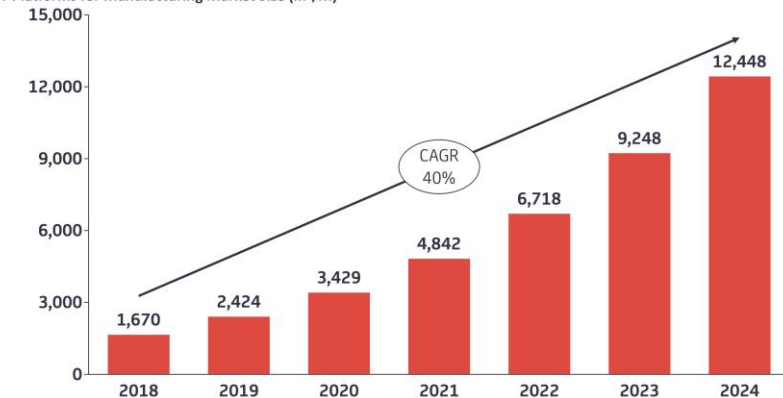


IOT ANALYTICS

Insights that empower you to understand IoT markets

IIoT Platforms for Manufacturing – Market Overview

Global IIoT Platforms for Manufacturing Market Size (in \$M)



Note: The IIoT Platforms for Manufacturing market accounts for both Factory & Non-factory settings; that is standardized production environments such as factories, plants, workshops, as well as custom production workites such as mines, offshore oil&gas and construction sites.
Source: IOT Analytics – March 2019

Alternative Data Sources

Additional data monitoring / sensors may not be needed

Data mapping can identify hidden or proxy sources of data

- Examples:
 - Machine Drive controllers have tags for motor current / start/stop times
 - Motor Controllers record variations in speed/current to a motor
 - Batch product weight may be sufficient to count individual parts
 - Short term monitoring may establish profiles linked to available data

Computer Vision Systems are an Industry 4.0 Game-changer for non-invasive monitoring of process, people and parameters.



Example: Takumi Precision

Problem

1. Lack of awareness of current Machine and Job Status
2. Paper based Job Scheduling with delayed and inaccurate reporting

Steps

- Pilot Project on 4 Doosan CNC Machines
- Mapped data flows using activity modelling
- Added digital input devices to capture better operator data
- Integrated machine-available data for comparison



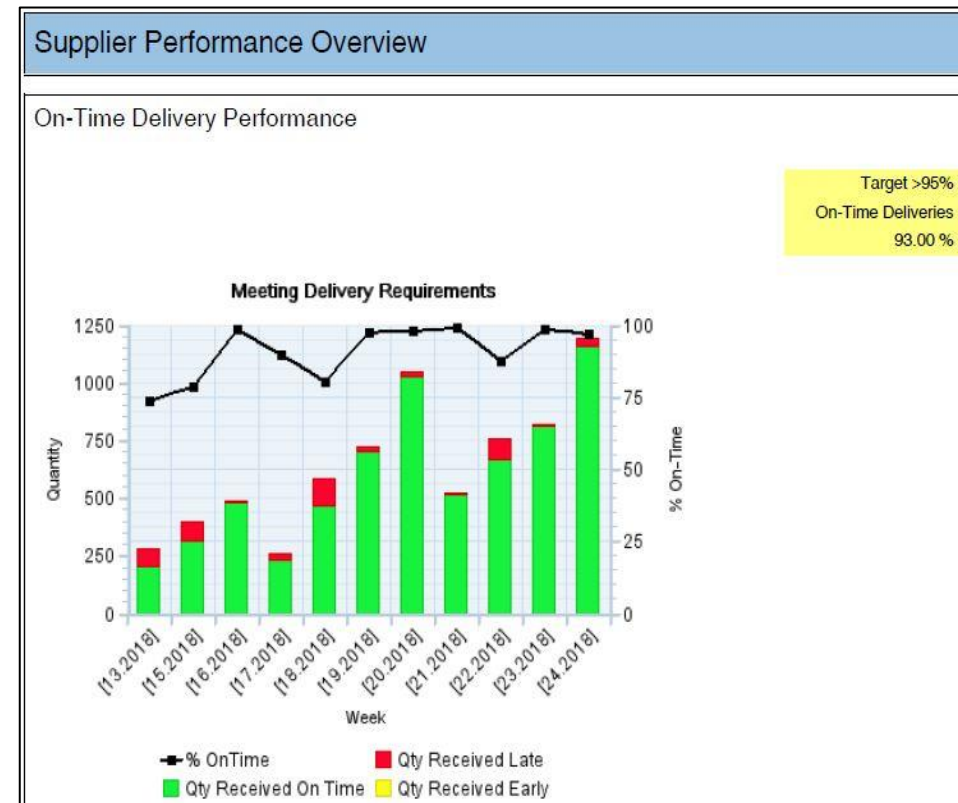
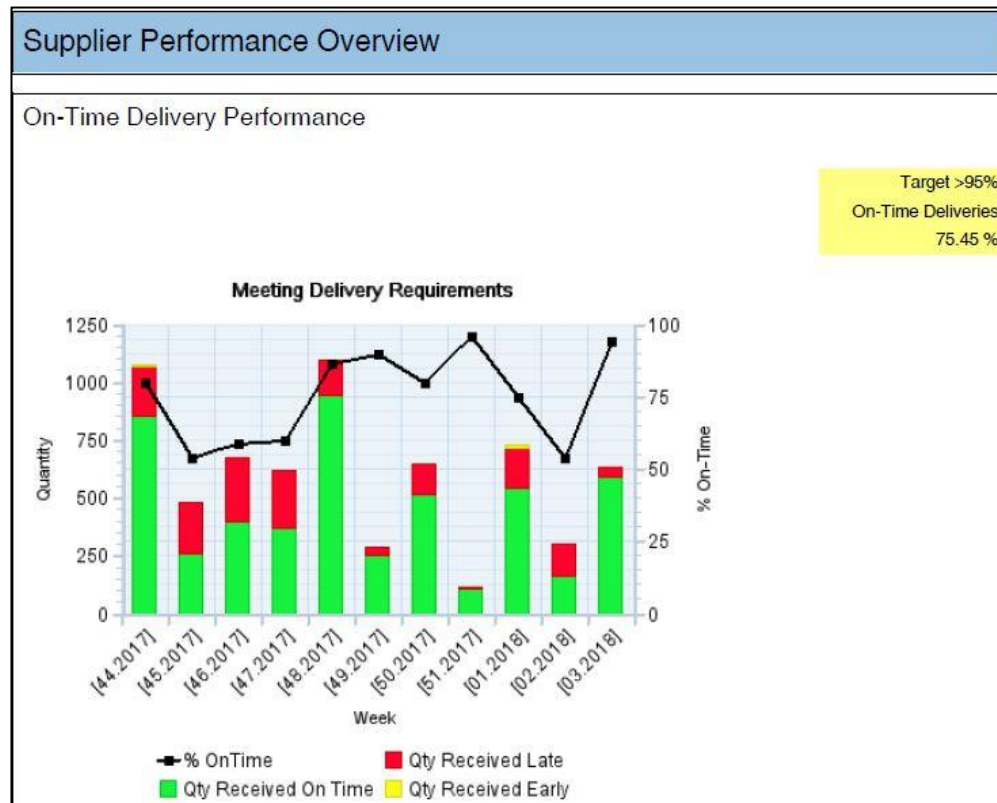
Job:	Part:	OP:	Customer:	Start By:	Due Date:	Machine:
122162-4	C01615501-006	10	GKN Aerospace Services	Jun 28 2018	Jun 28 2018	Doosan 20
122159-6	C01615491-007	10	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	Doosan 20
122154-2	C01615461-004	10	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	Doosan 20
122148-D4	C01615432-006	20	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	
122148-D4	C01615432-006	10	GKN Aerospace Services	Jun 27 2018	Jun 27 2018	
122148-3	C01615432-006	20	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	
122148-3	C01615432-006	10	GKN Aerospace Services	Jun 27 2018	Jun 27 2018	
122146-3	C01615432-005	20	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	
122146-3	C01615432-005	10	GKN Aerospace Services	Jun 27 2018	Jun 27 2018	
122146-2	C01615431-005	20	GKN Aerospace Services	Jun 27 2018	Jun 28 2018	
122146-2	C01615431-005	10	GKN Aerospace Services	Jun 27 2018	Jun 27 2018	
123104-6	MO100039	10	Optel Vision Ltd	Jun 26 2018	Jun 27 2018	Doosan Small
122372-1	902-0983-02	15	Innalabs	Jul 4 2018	Jul 5 2018	Doosan Small
122372-1	902-0983-02	1	Innalabs	Jul 3 2018	Jul 4 2018	Doosan Small

Factory Informer Version 1.0 2018-06-20 15:39:44 grattan

Example: Takumi Precision

Benefit to SME – Improved ‘On time Delivery’:

This metric, calculated by their main customer has increased from less than **80%** to greater than **90%** since operators have started reporting production activity using the new system.



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