

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 06: Collaborative Robotics Systems

MITSUBISHI ELECTRIC CASE STUDY











Collaborative Robots and Industry 4.0



Collaborative Robots and Industry 4.0





Mitsubishi – 144 Years of growing into a major brand covering over 40 companies



Each Mitsubishi company is separate entity and operates independently





MITSUBISHI ELECTRIC's Factory Automation – Product portfolio

- Software
- MMI
- PLCs
- Inverter Drives
- Motion Controllers
- Servos
- Motor Starters
- Switchgear
- Robots
- CNC
- EDM
- Laser Processing



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The Art of Manufacturing





Making sense of the world

Cloud of confusion?

Statistical degrees of freedom Big lloT **Analytics** Cloud Cyber physical systems data Industrie 4.0 Stuxnet Cyber Security Smart Factory Creative economy Industrial Internet Consortium Azure Small data Edge processing 中国製造2025

But what does it actually all mean?

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They are all related to the same thing...



A world where all parts are interlinked and coexist

...where efficiencies, cost reductions and productivity increases can be achieved through integrated automation and extracting hidden benefits from existing resources





Kaizen based manufacturing; Plan, Do, Check, Act



An ICT driven world enables this process to be faster and more efficient





| e-F@ctory | FA/IT integration solution |
|---|--|
| Basic Concept | e-F@ctory uses FA technologies and IT technologies to reduce total cost of development, production, and maintenance and to support advanced manufacturing (Monozukuri) |
| Production sites optimized by CFOCICIY can | Collect production-site data in real time |
| | Seamlessly link data collected through FA with the IT system |
| | Feed back analysis results from the ICT system to production sites |





FA Integration Solution *C*-Factory

This solution improves

- Productivity Quality Environment
- Safety · Security

e-Factory

Alliance Partners:

279 companies

2800 companies

• Direct

Indirect

Alliańce

through

• Visualization with analysis Improvements

since 2003

• 130 factories.

• more than 5000

Increased availability at production sites

It assists companies to reduce TCO and to improve the company values.





e-Factory











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Robotics in an Industry 4.0 context







eco

Why robots are important for I 4.0?

- Statement from IFR :"By 2018 global sales of industrial robots will on ٠ average grow year on year by 15 percent"
- Flexible production is a main point of I4.0 ٠
 - Constant operation at high speed •
 - Reduced operation costs •
 - Reliable •
 - robots are giving the flexibility ٠
 - Down to single lot production •
 - Simulation and automatic program creation •







Robotics in manufacturing

New kind of applications and tasks can be handled by collaborative robots which have not been automated before.

Traditional industrial robots (Cooperative)

To improve the performance of the machine Very fast and precise

Human can interact and co-operate with the robot with reduced speed/torque and limited position

Collaborative robots

Support the worker -> work like humans Safety first

Slow and easy to use and easy to move Human can work all the time close to the robot

Collaborative robots are more a complementary to industrial robots than a competitor of traditional industrial robots







Cooperating robots for I 4.0

Intelligent periphery Force sensor (control the force like human being) Camera (to see like human being) 3D vision for bin picking Safety (worker can interact with the robot without stopping the robot)









Collaborative Robots

What is next important?

- Detecting the collision before the worker touches the robot by wireless sensors
- Easy teaching by moving the arm manually to the position
- Interactive control of robot by touching the robot arm and give commands like start, program change







Expanding beyond collaborative robots



Information within a single platform is available for all disciplines

Result:

- far lower integration cost
- Single interface to enterprise systems





for a greener tomorrow Changes



Automated and manual processes coexist in manufacturing environment. Human for high intelligence flexibility Automation supports the human by doing repetitive and low level intelligent tasks along the value chain



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Cloud and Robotics



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Collaborative Robots and Industry 4.0

Thank you. Danke. Merci. Grazie. Gracias. Teşekkürler. شكرا ありがとうございました。 謝謝。 спасибо

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