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# Driving the Transition to Industry 4.0/5.0

## Advanced Technologies for Low-Carbon, Digital, and Energy-Efficient Production

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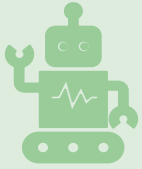
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**FS**

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# Introduction



## What is Industry 4.0?

- Automation and Robotics (I3.0)
- IoT, Edge Computing and Cyber-physical systems
- Digital Twins, AI and data-driven decision-making, Cyber security...



## What is Industry 5.0?

- Human-centric
- Sustainable & resilient manufacturing & Circular Economy
- Reducing waste & Emissions



## Why is this transition important?

- Digitalization,
- Economic competitiveness and
- Climate change

# Draghi Report – Key Insights

## ◆ Challenges:

- Europe lags in digital innovation, depends on external suppliers
- Needs strategic autonomy in key sectors

## ◆ Recommendations:

- 1 Invest in AI & Green Tech
- 2 Strengthen Supply Chains
- 3 Boost R&D Funding
- 4 Reskill Workforce
- 5 Foster Innovation

## ◆ Slovenia's Opportunity:

- ✓ Attract high-tech investments
- ✓ Support AI, green tech & digital transformation



# Situation in Slovenia

- Strong research institutions
- Many initiatives, activities and events in Slovenia
  - ❑ at the governmental level (events, public calls - MGRT, MIZŠ, SVRK )
  - ❑ at the level of associations (Slovenian Chamber of Commerce – GZS, SRIP ToP and other SRIPs, DIH Slovenia, KCSTV...)
  - ❑ at the research institution's level (Faculties and Laboratories of the Slovenian Universities, JSI, TECOS... )
  - ❑ at the level of companies (Kolektor/Qulector, Yaskawa, TPV, Adria Dom, Telekom and many others, ...)
- A lot of ideas ...

## BUT

- The impact is expected to be higher/bigger/faster
- Probably not enough financial means
- **Or is there SOMETHING ELSE ?**

# Challenges in Slovenia

- SMEs adoption gap
- Most of the companies DO NOT really understand the essence of I4.0 and Smart factory concepts – connectivity and transparency
- Workforce upskilling needed - The lack of human potential and I4.0 competent experts – better situation in bigger companies, not so good in smaller companies
- A lot of initiatives, different events for spreading the idea of digitalization and I4.0 technologies – **MORE EFFICIENT REALIZATION is MISSING!**

**Industry 4.0 and 5.0 needs more than just new technologies – it demands a cultural shift**

# SRIP FoF: Smart Factories - Goals and Action plans until 2030

## Development & Implementation of Advanced Technologies

Expand the use of **AI, IoT, and digital twins** to optimize production.

Introduce **automated and (self)adaptive production systems** for increased efficiency.

Enhance **predictive maintenance** using advanced sensors and machine learning.

## Transition to Low-Carbon and Energy-Efficient Production

Implement **energy management systems** and integrate **renewable energy sources**.

Optimize processes to **reduce waste and emissions**.

Develop and adopt **circular economy principles** in production.

## Digitalization and Smart Connectivity

Strengthen **process automation and digital monitoring** through AI-driven solutions.

Improve **cybersecurity measures** for industrial networks.

Foster the **integration of smart factories into global supply chains**.

## Human Resources & Competence Development

Invest in **education and training** for employees to develop Industry 4.0/5.0 skills.

Encourage cooperation between **universities and industries** to transfer knowledge.

Promote **interdisciplinary research and innovation** in smart manufacturing.

## Funding & Policy Support

Secure funding from **EU and national programs** (Horizon, Interreg, etc.).

Establish a **National Demonstration Center for Smart Factories**.

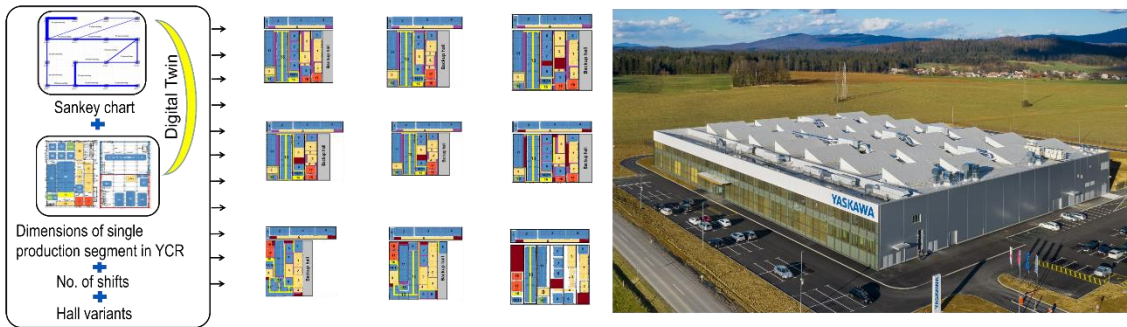
Foster **public-private partnerships** to accelerate technology adoption.



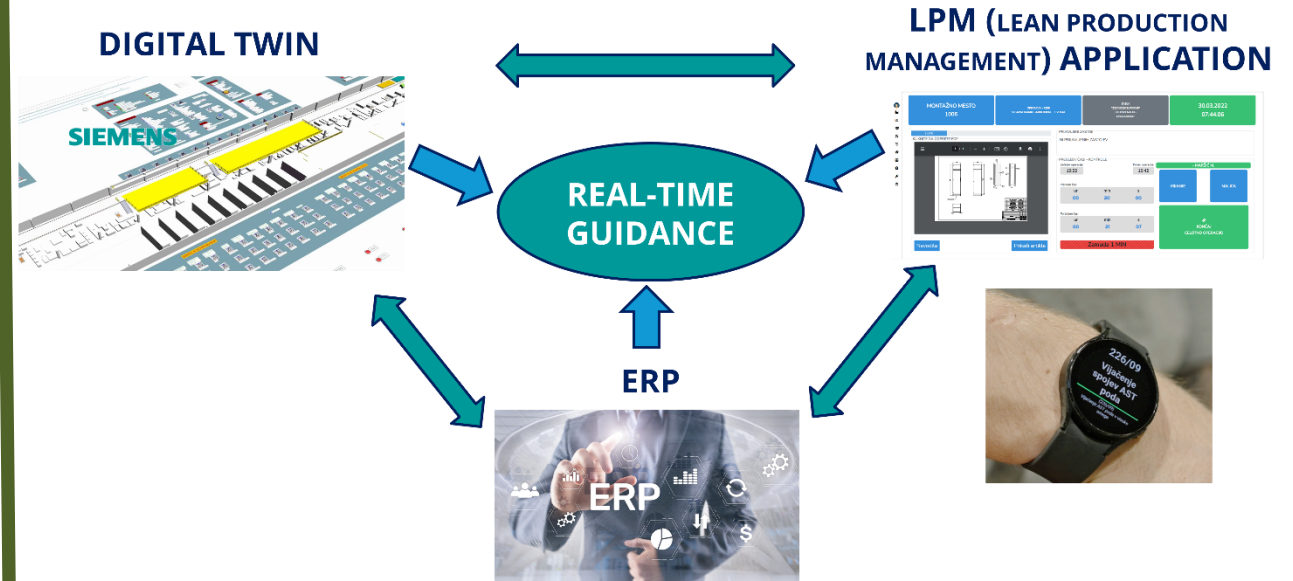
# Three main Use Cases & References

## Use Case 1: Digital TWIN of the new YASKAWA robot factory

- Detailed global digital twin of the entire factory (overall production and logistics processes, single production processes, internal logistics, supply chain, warehouses, ordering process etc.)
- Decisions for building and planning the factory are based on the global digital twin of the factory



## Use Case 2: Real-time guidance of workers

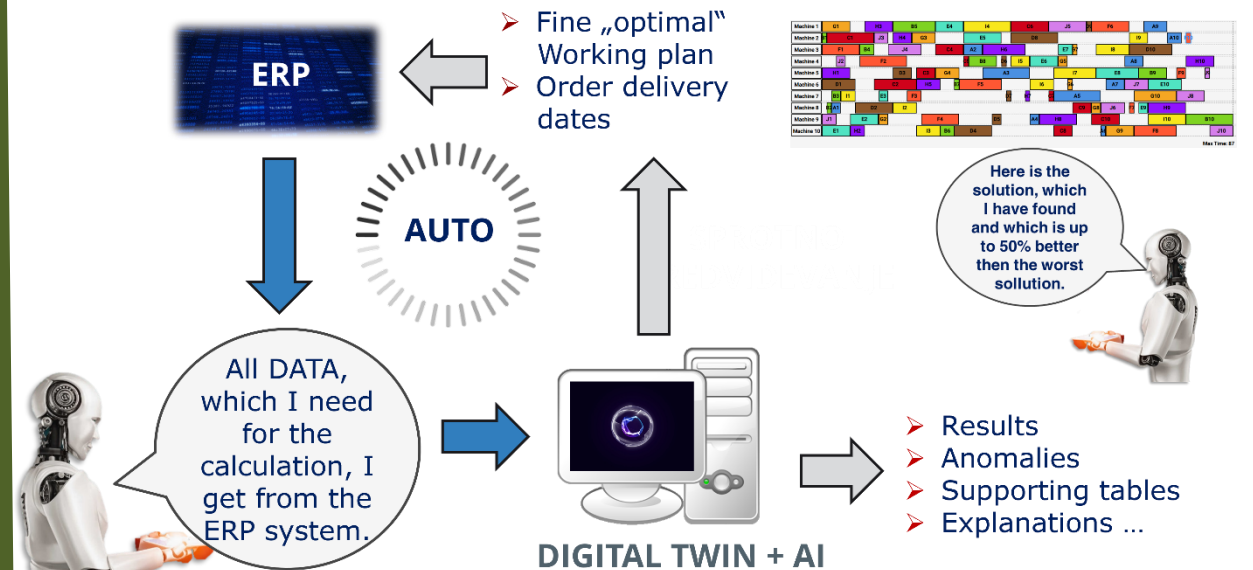


## Our major references



For the achievements and industrial applications in the field of Smart Factory technologies – AI and Digital Twins our TEAM received different prestigious awards

## Use case 3: Integration of Digital Twin & AI with ERP system in different companies for REAL TIME PLANNING

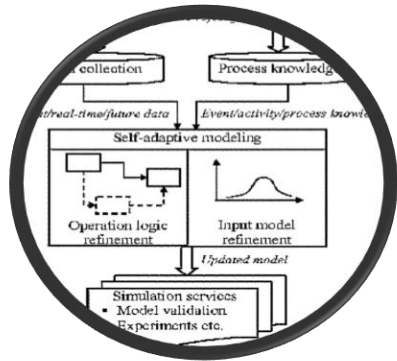


# What can we offer?

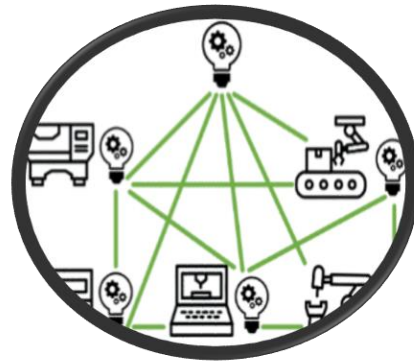


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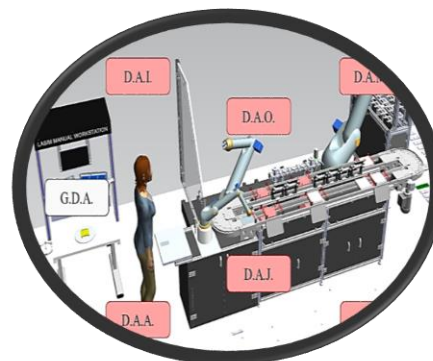
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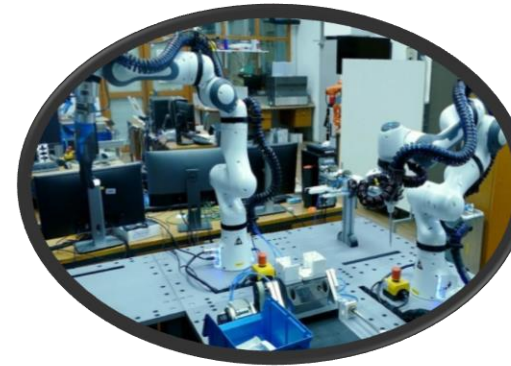
Artificial Intelligence and Smart Algorithms



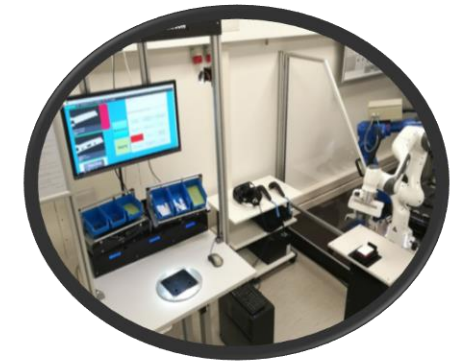
Distributed Systems and Edge Computing



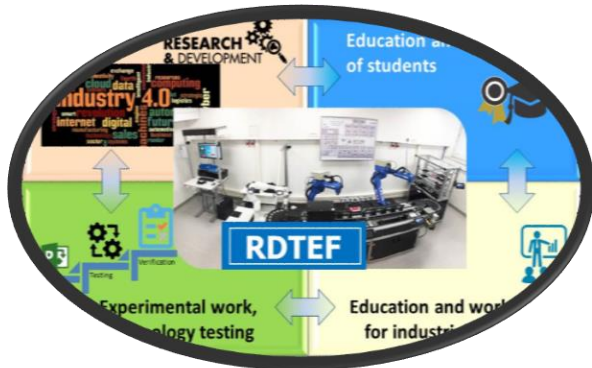
AI based Digital Twins and Agents for autonomous decision making



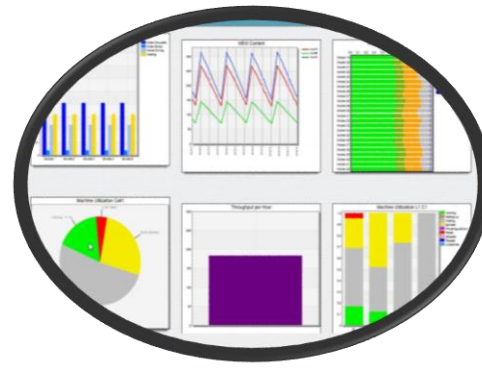
Flexible, Agile, Reconfigurable Robotic and Cobotic Cells



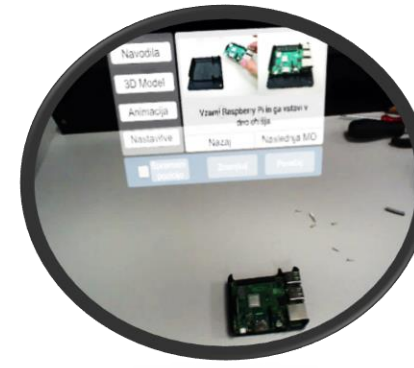
Smart Production, Manufacturing (ERP-MES-Digital twin interconnectivity)



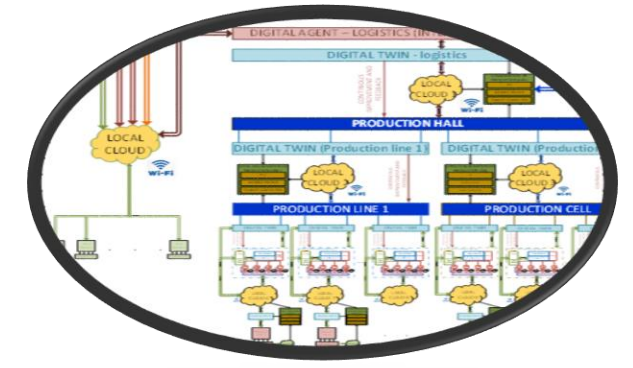
Experimental and Testing facilities



Modelling, Simulation, Data Analytics



AR and VR



Architectural Models, Smart Factories, Communication Protocols and 5G



# Thank you for your attention!

## Co-ordinates:

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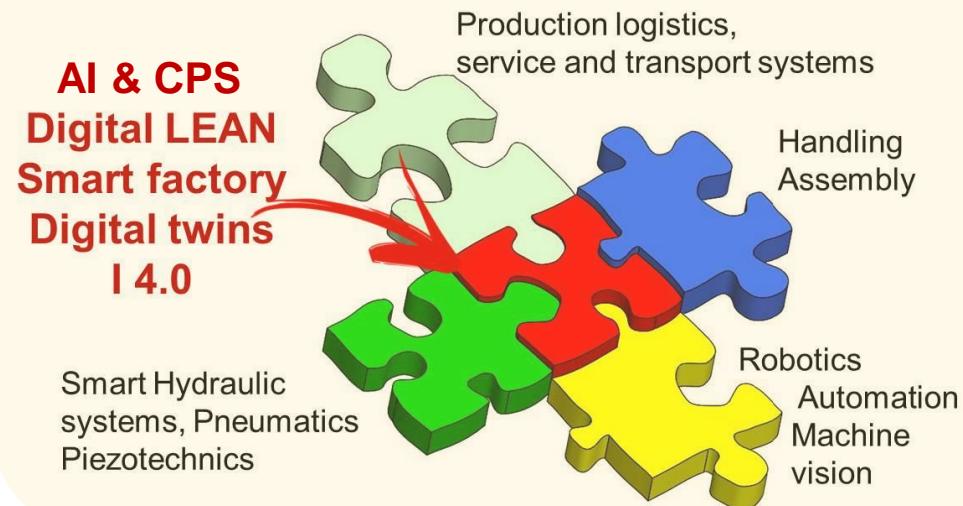
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## R&D fields



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