Digital Factory

Dr. Juha Hirvonen

16.2.2021

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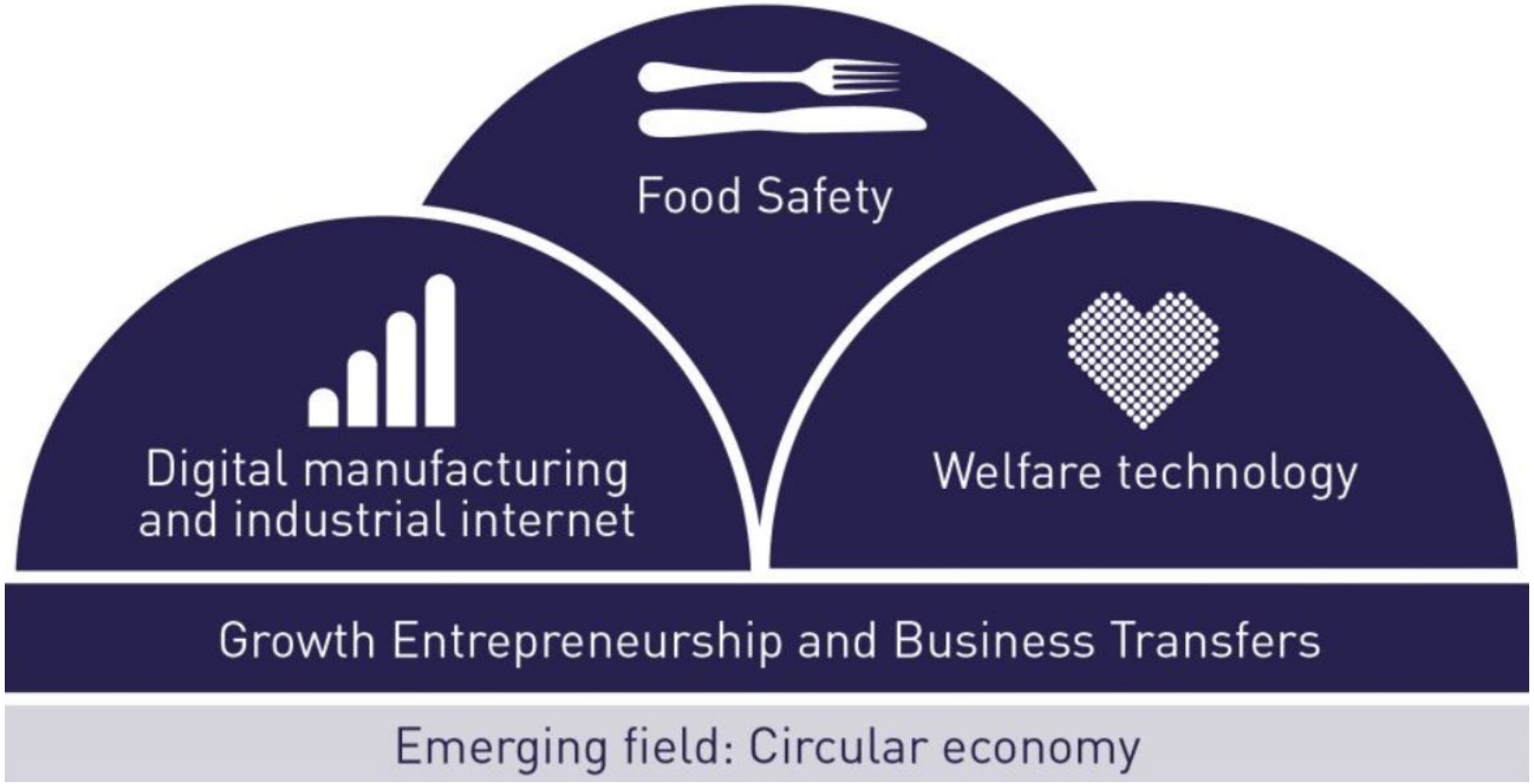
SeAMK Profile Areas



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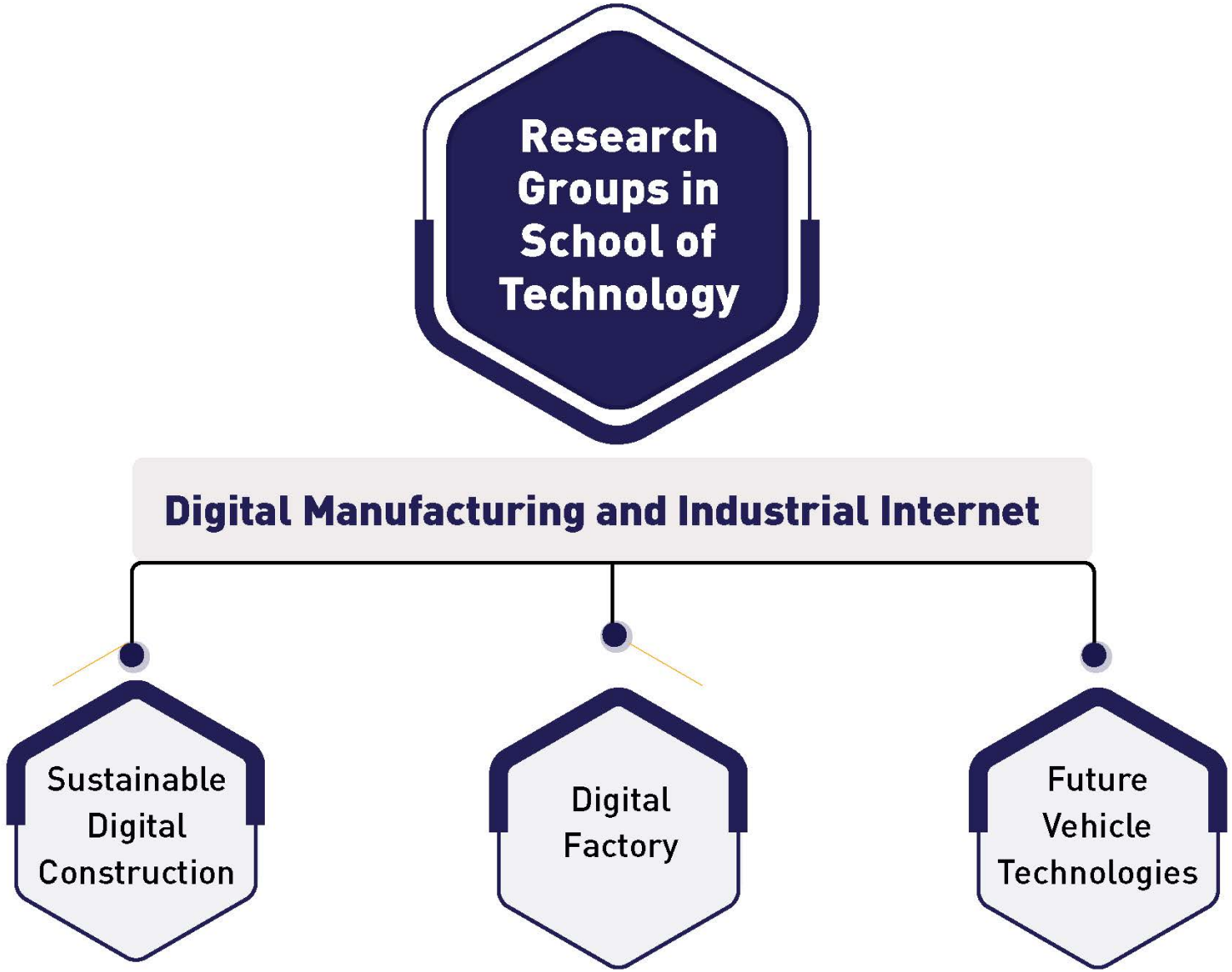
Research Groups in School of Technology



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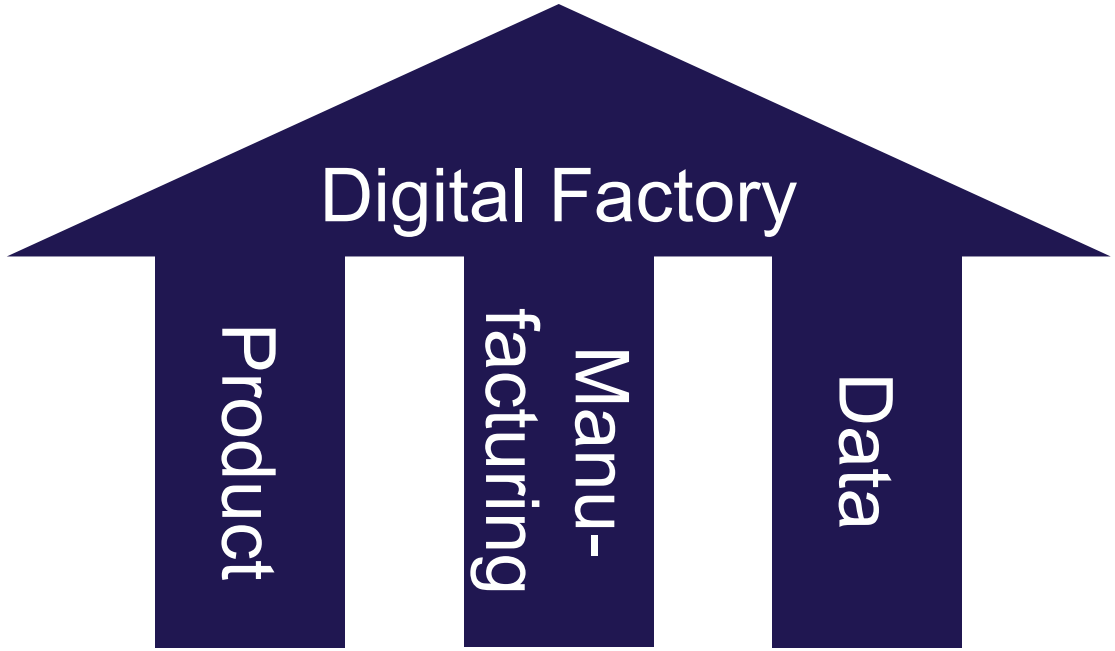
Digital Factory

- Digital manufacturing and IoT for **manufacturing industry**
- Three aspects
  1. Product
  2. Manufacturing process
  3. Measurement data



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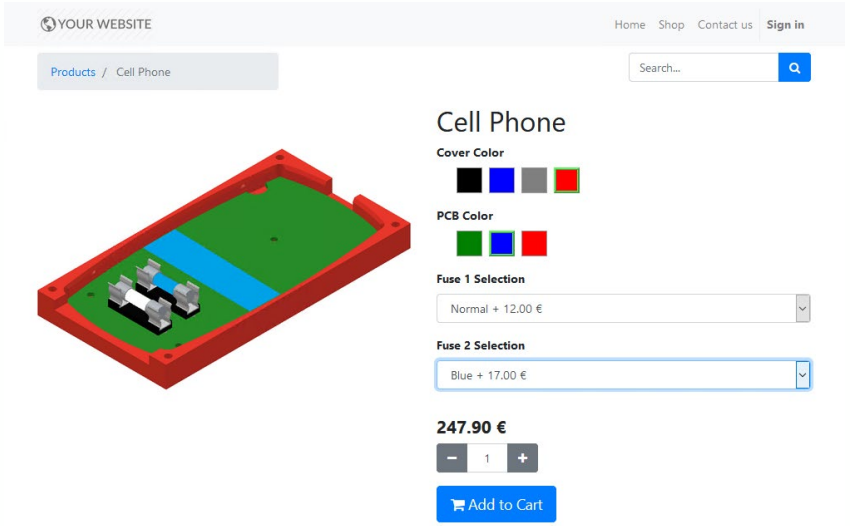
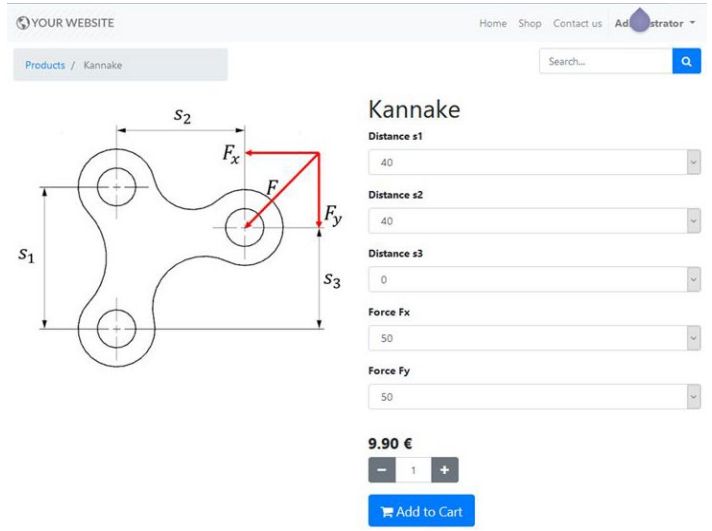
Product Aspect

- Digital design (CAD, CAE)
- Product data management
- ERP/MES communication





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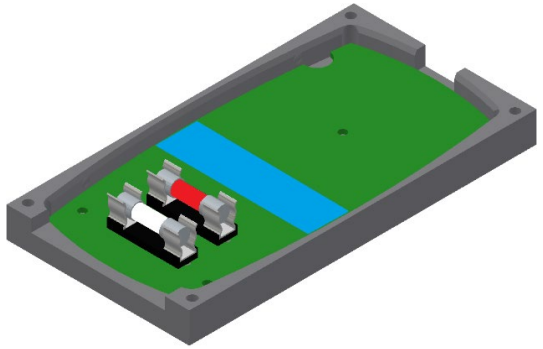

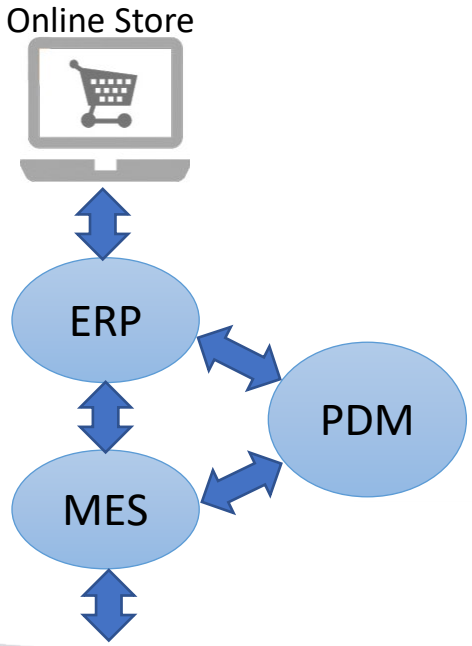

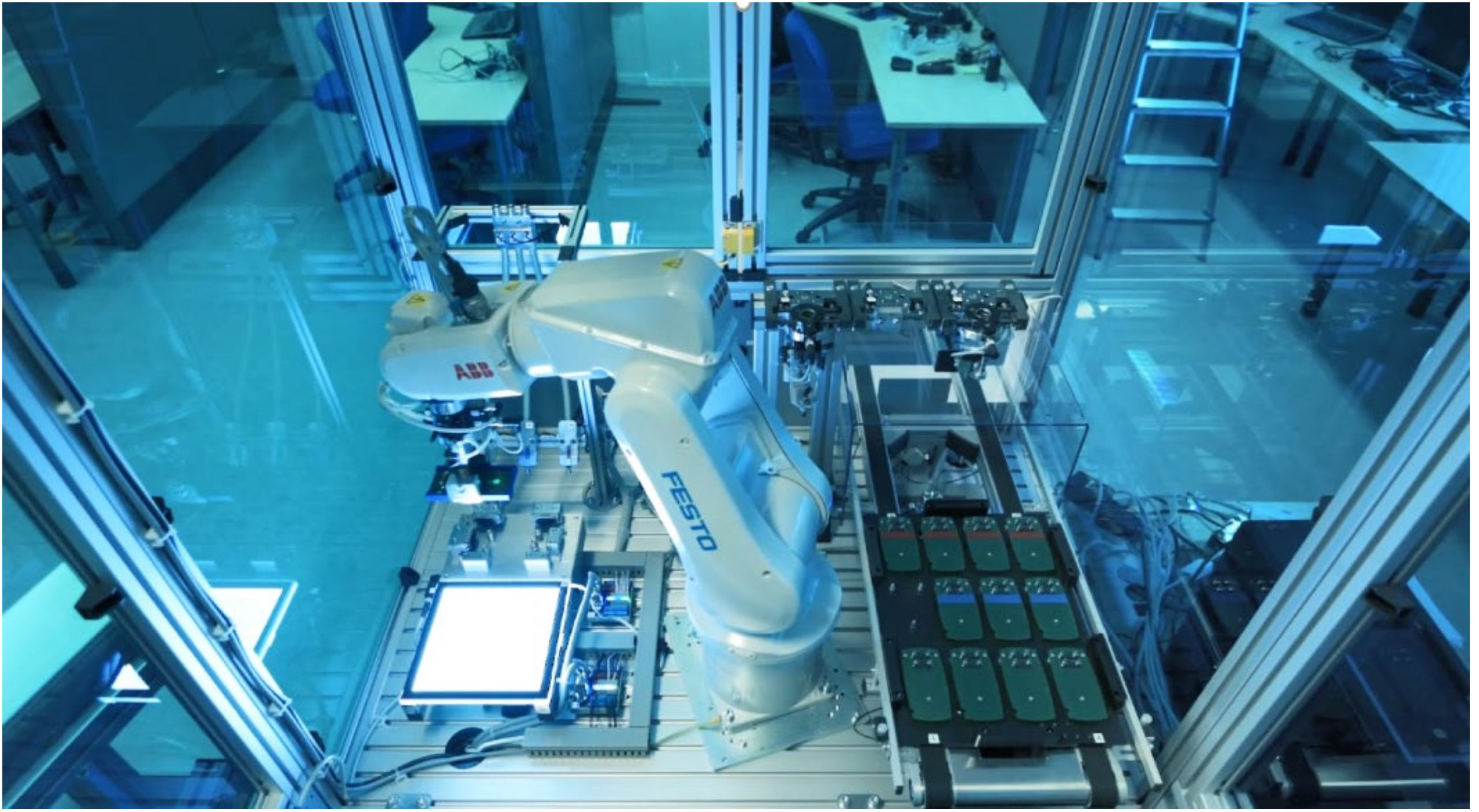
ABB
FESTO

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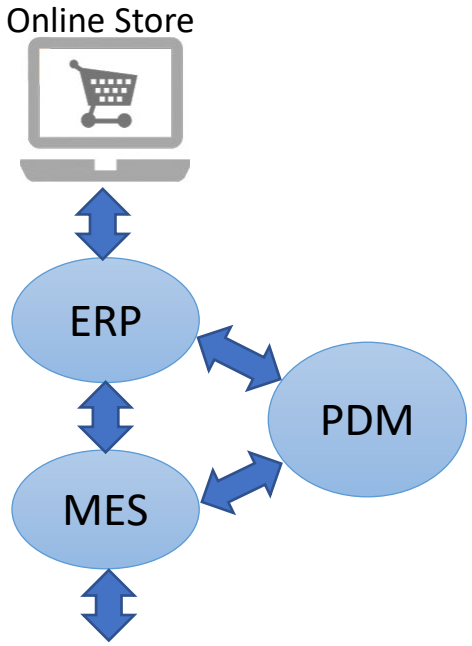

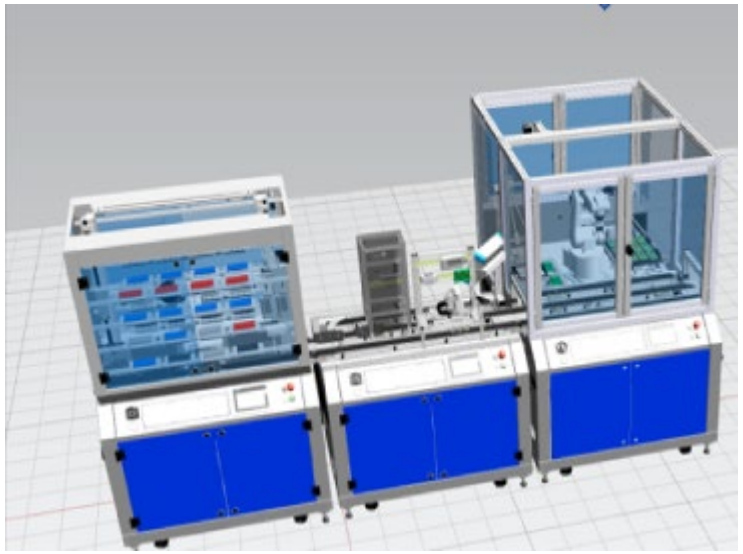

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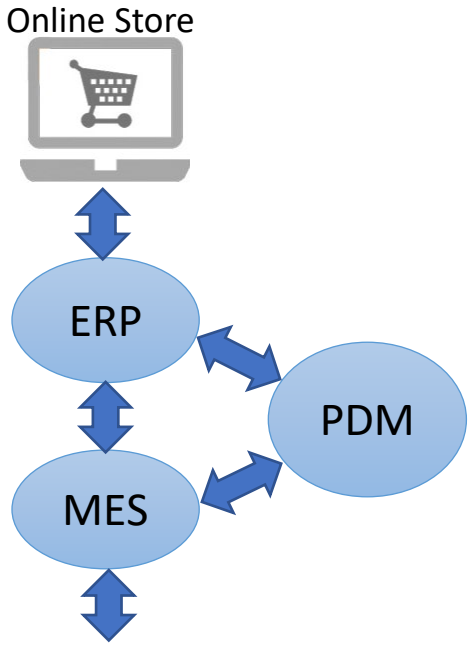

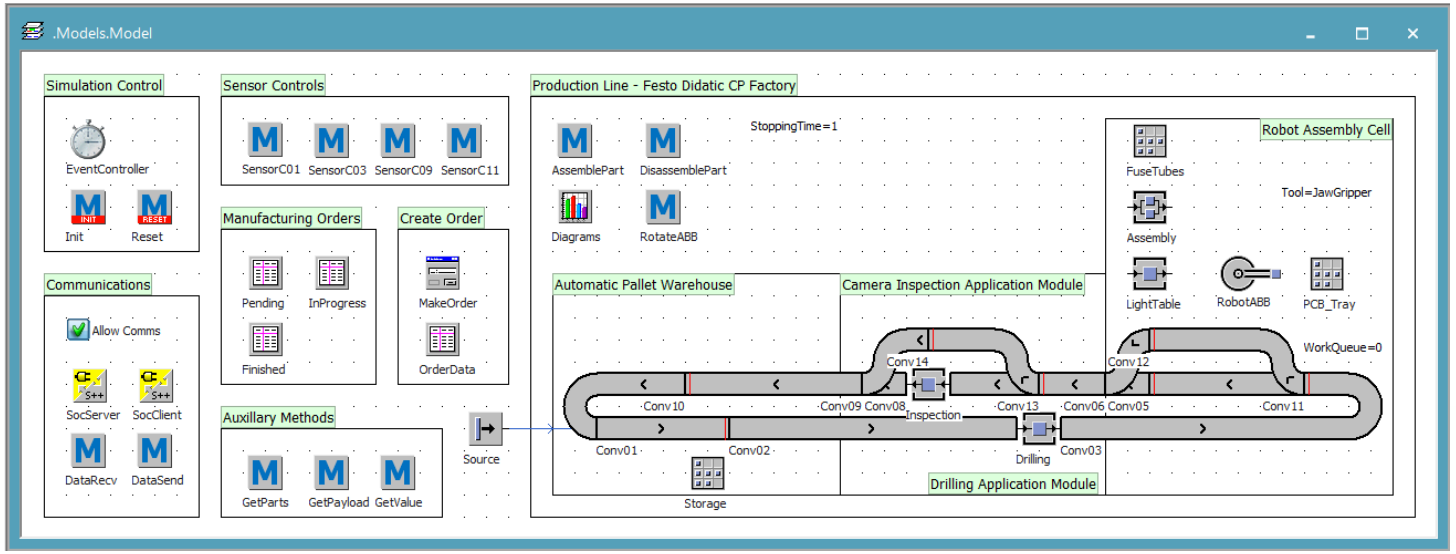

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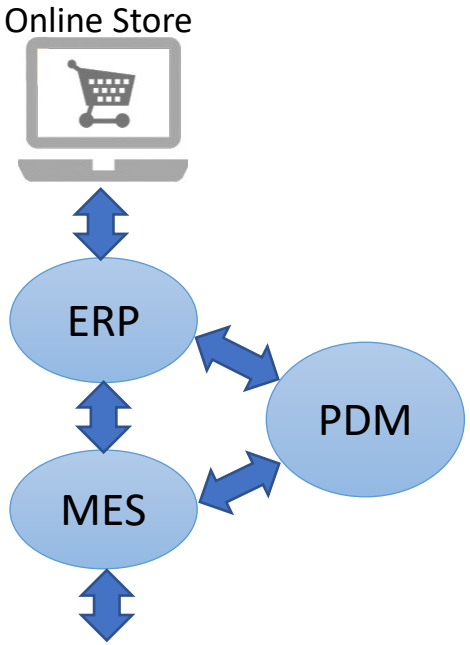

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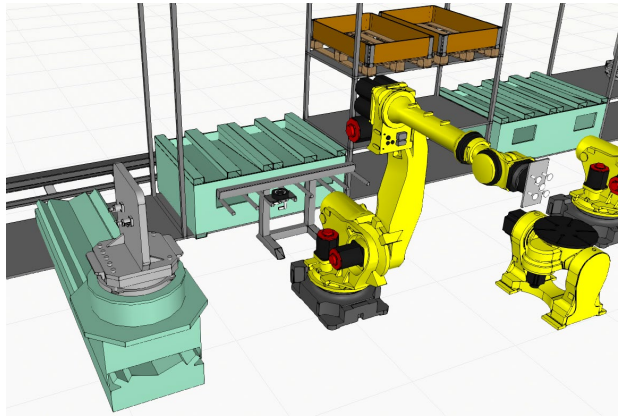
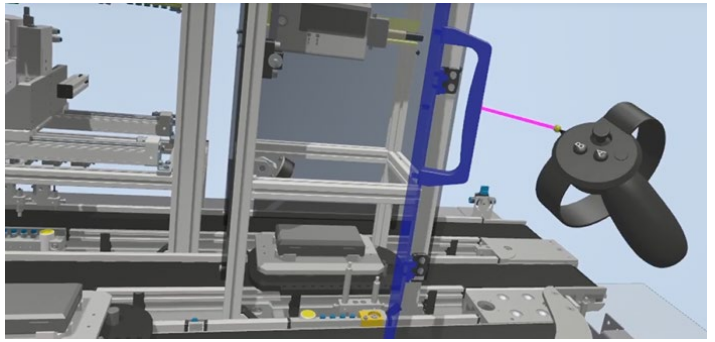
Manufacturing Process Aspect

- Modeling and optimizing manufacturing systems
- Applying robotics





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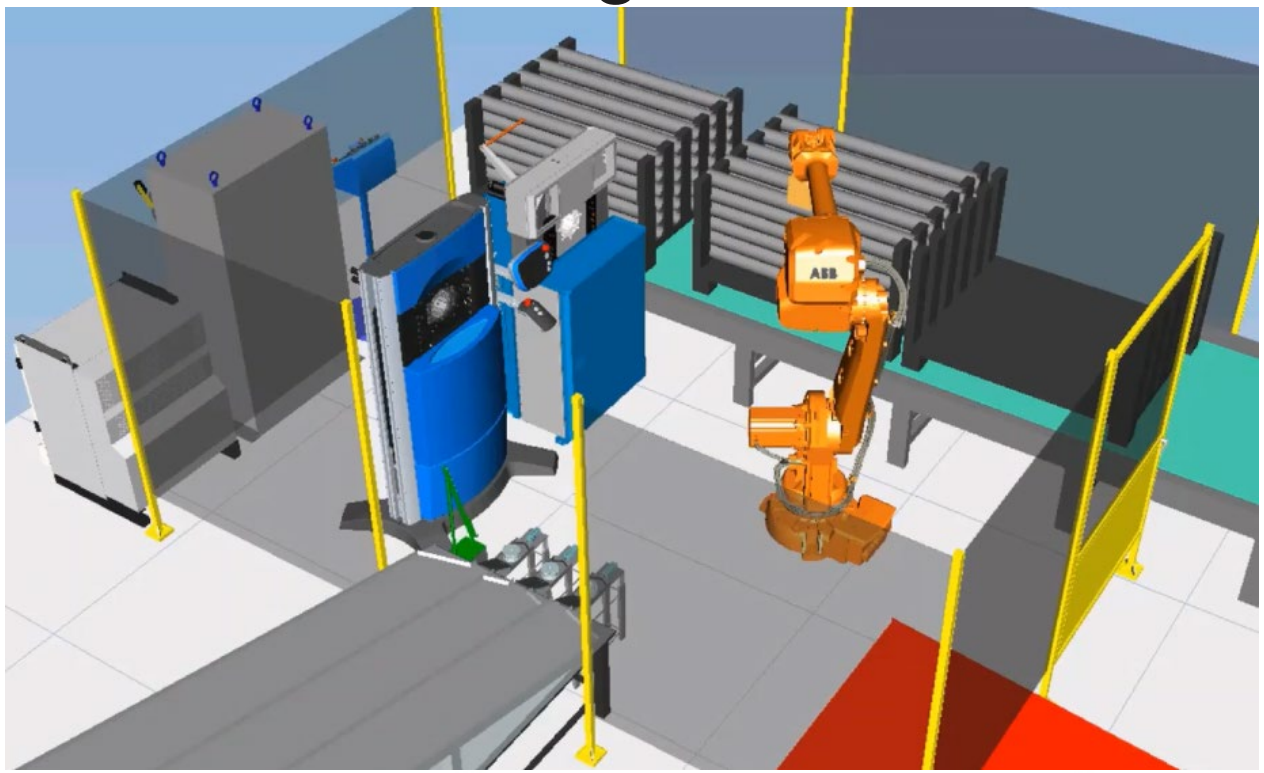
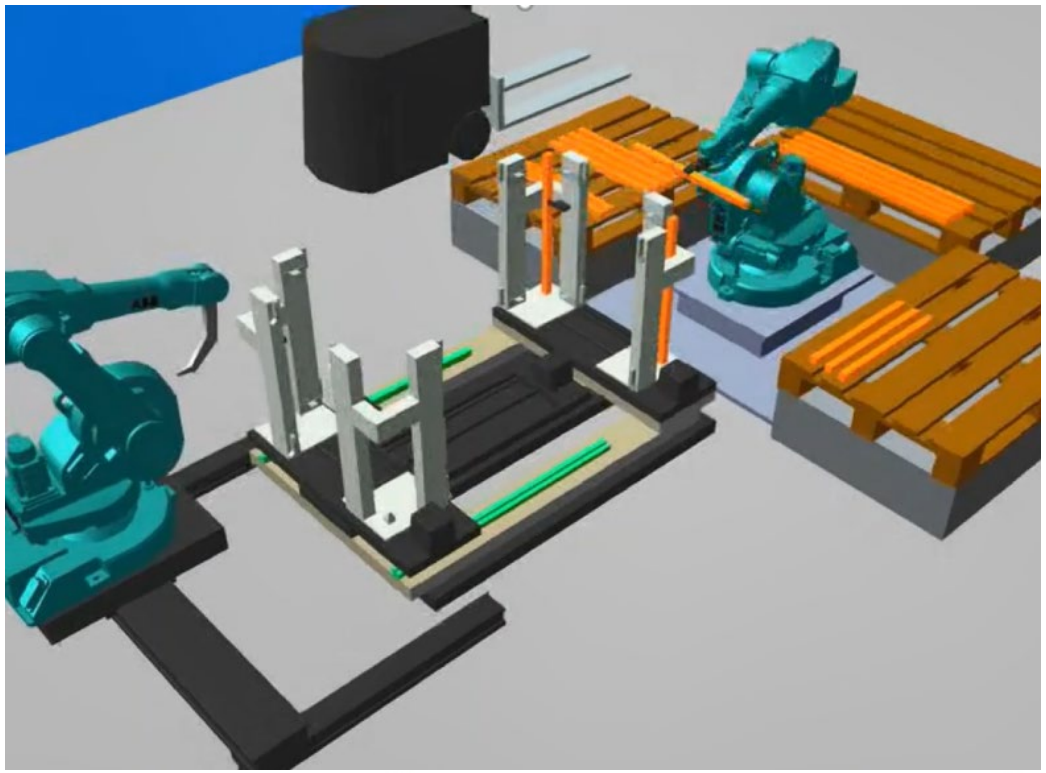
Manufacturing Process Aspect

- Manufacturing simulations





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https://www.youtube.com/watch?v=m5nuHPNX3Cc

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Manufacturing Process Aspect

- Creating pilots with cobots and industrial robots

https://www.youtube.com/watch?v=DWB7k1Hzlew

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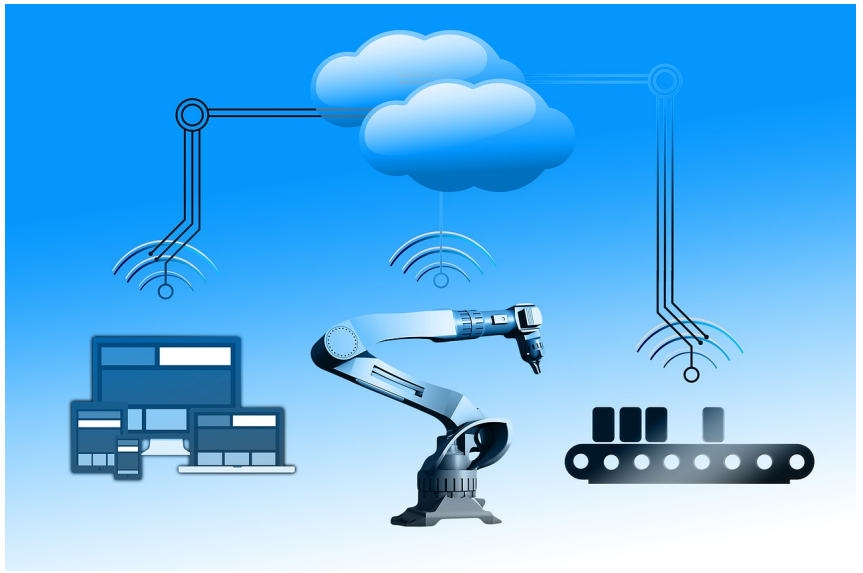
Measurement Data Aspect

- Data collection
- Data analysis
- Data visualization
- Machine vision



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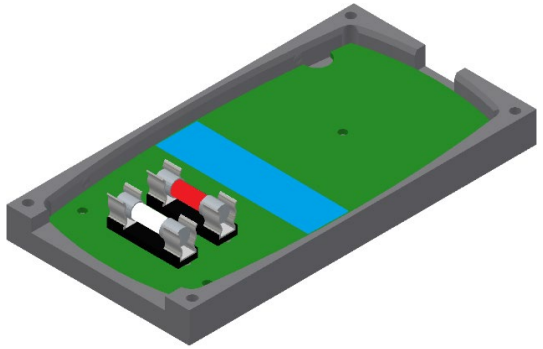

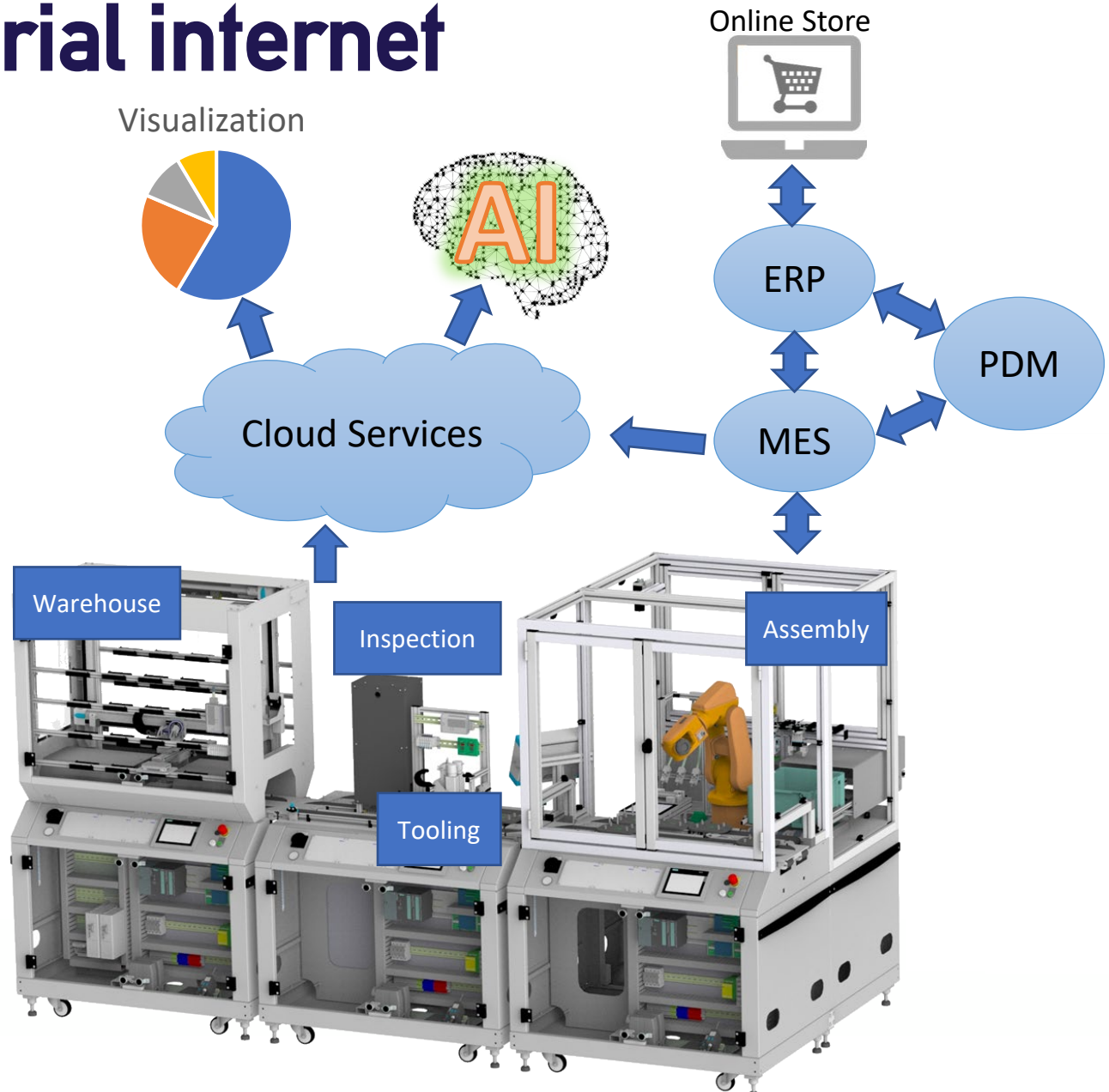

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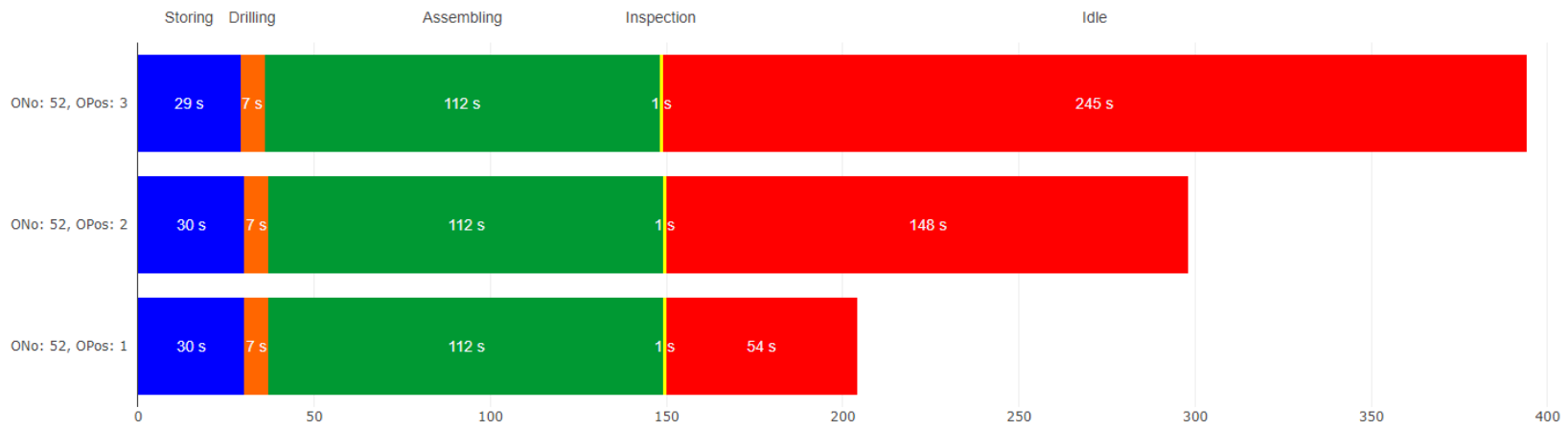
Measurement Data Aspect

Data of the Finished Orders

Order Number	Order Position	Part Number	Start	End	Storing	Drilling	Assembling	Inspection	Total Work Time	Idle Time	Full Duration	Efficiency
52	3	35130	2019-03-05 10:37:27	2019-03-05 10:44:02	0:00:29	0:00:07	0:01:52	0:00:01	0:02:29	0:04:05	0:06:34	37.8
52	2	35130	2019-03-05 10:37:10	2019-03-05 10:42:09	0:00:30	0:00:07	0:01:52	0:00:01	0:02:30	0:02:28	0:04:58	50.3
52	1	35130	2019-03-05 10:36:53	2019-03-05 10:40:18	0:00:30	0:00:07	0:01:52	0:00:01	0:02:30	0:00:54	0:03:24	73.5

The Process & Idle Times



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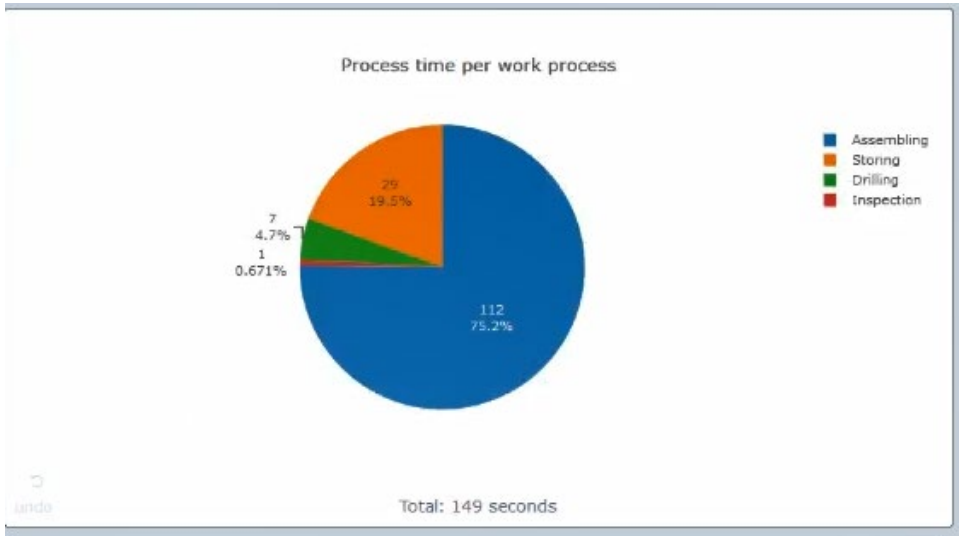
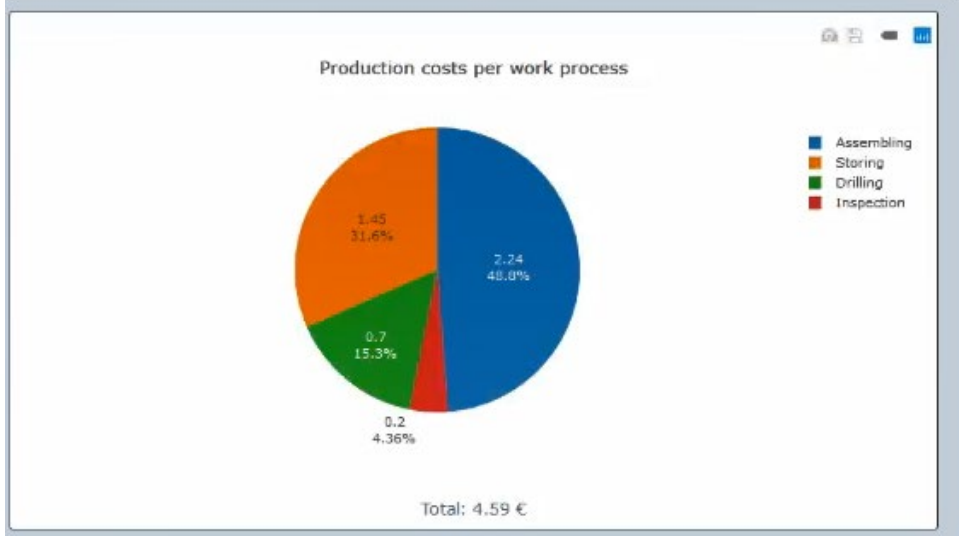
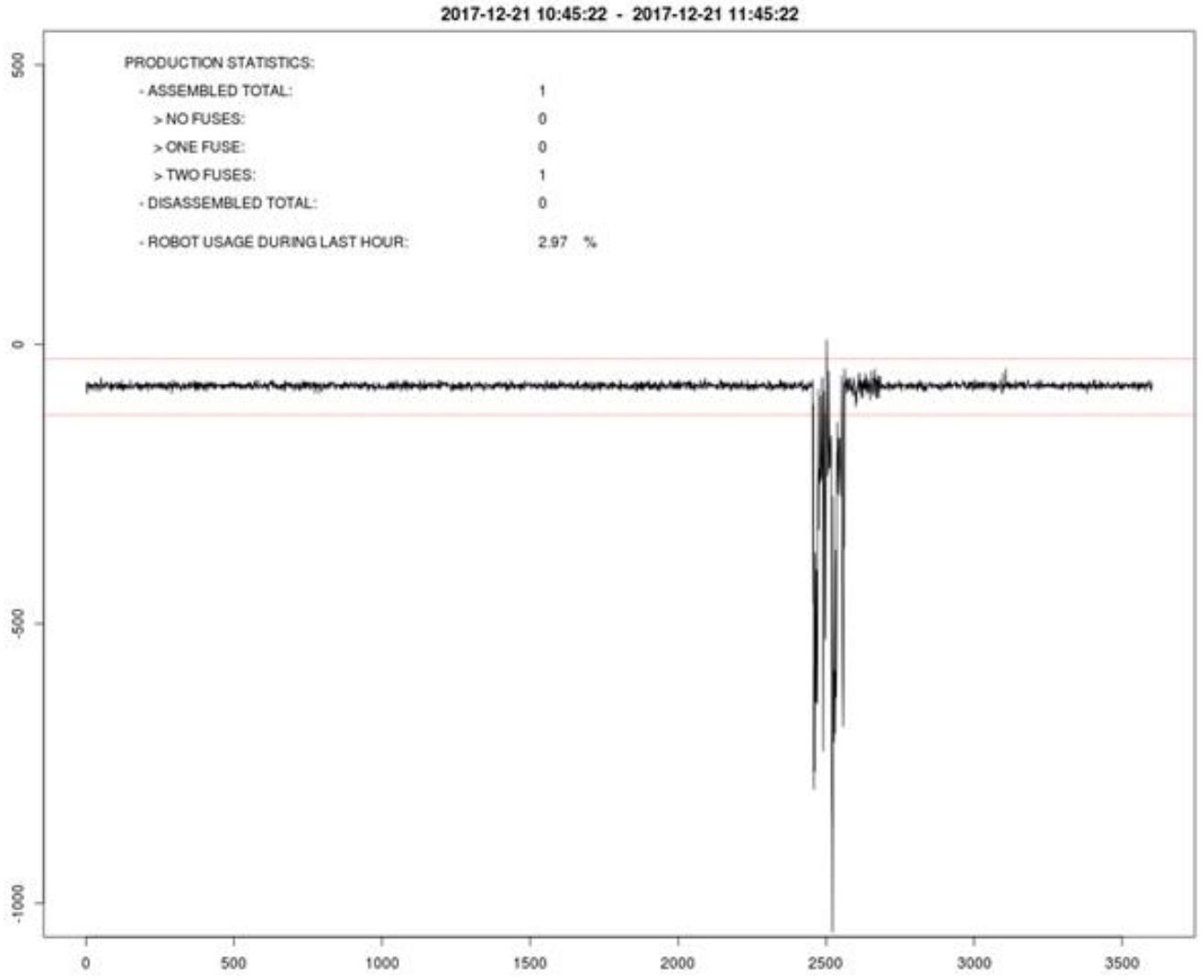
Measurement Data Aspect







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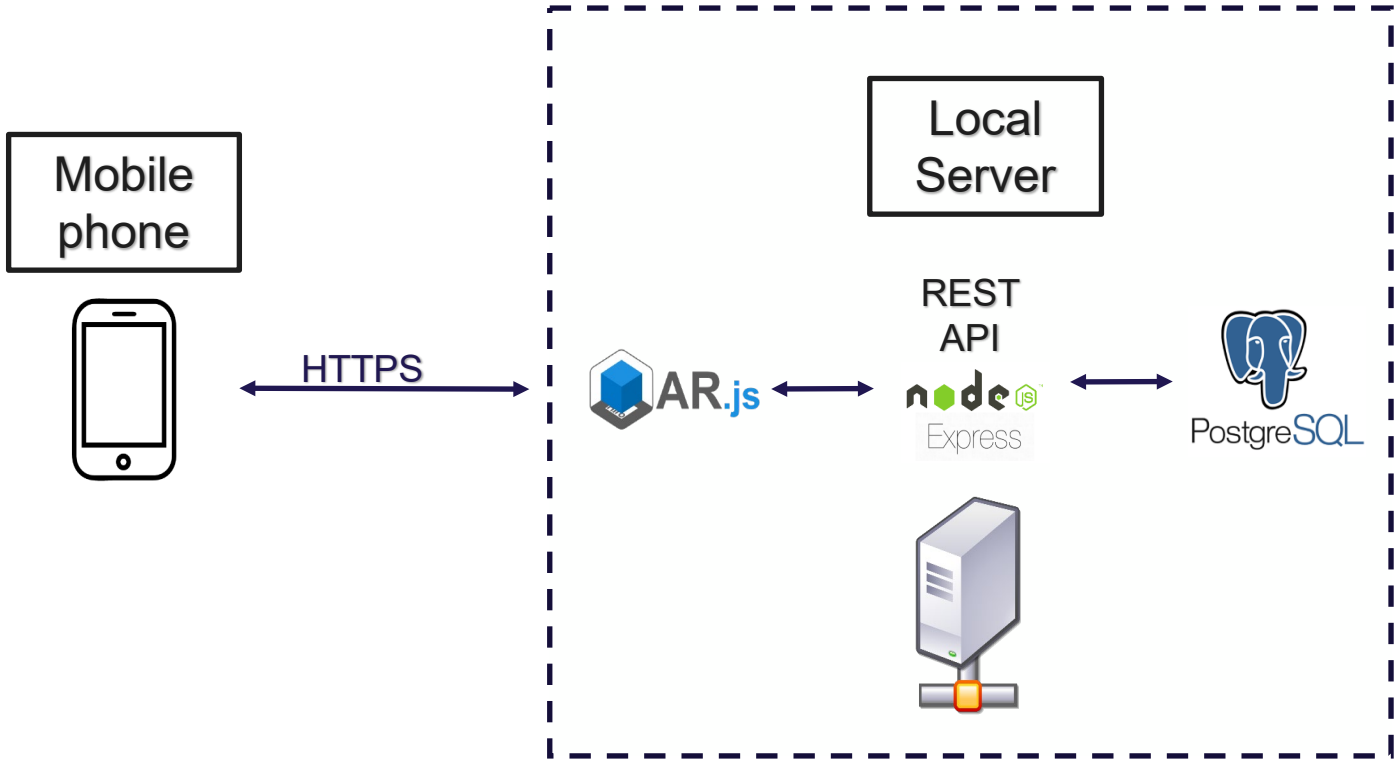

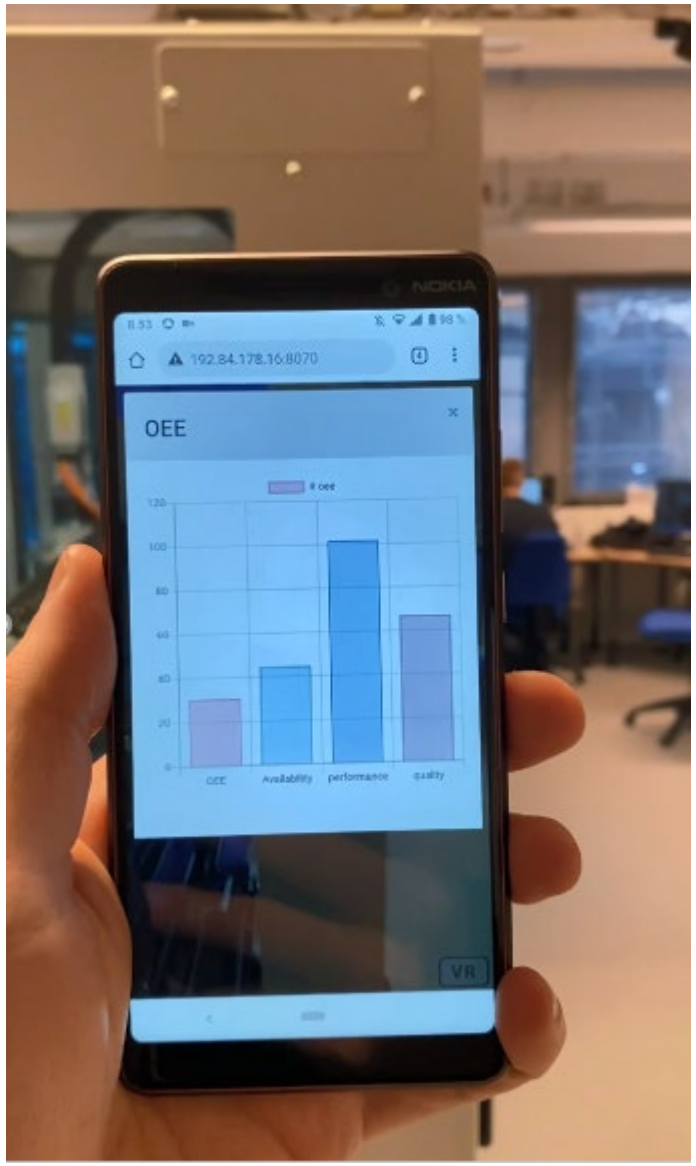

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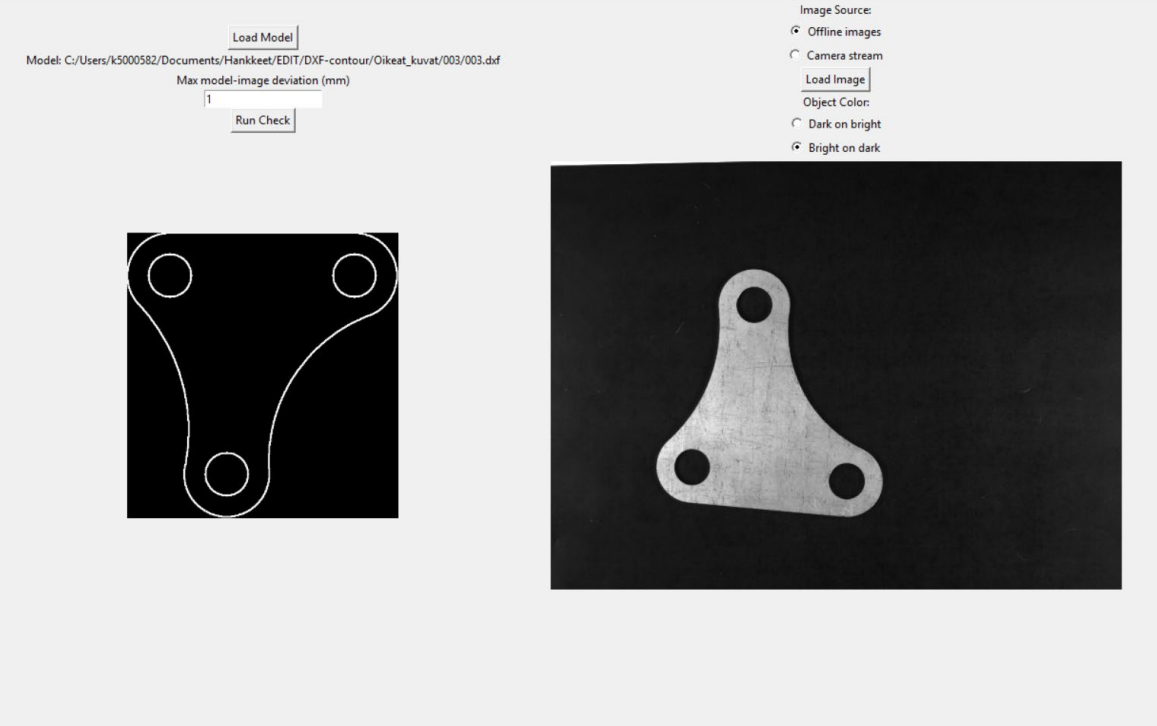
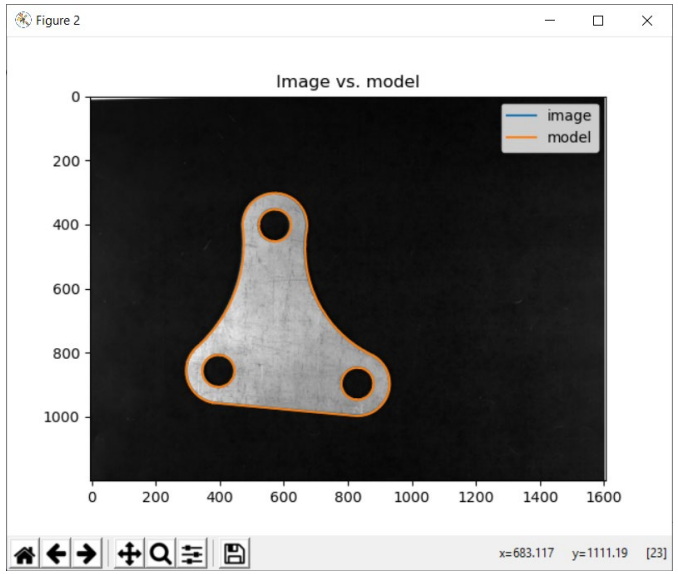
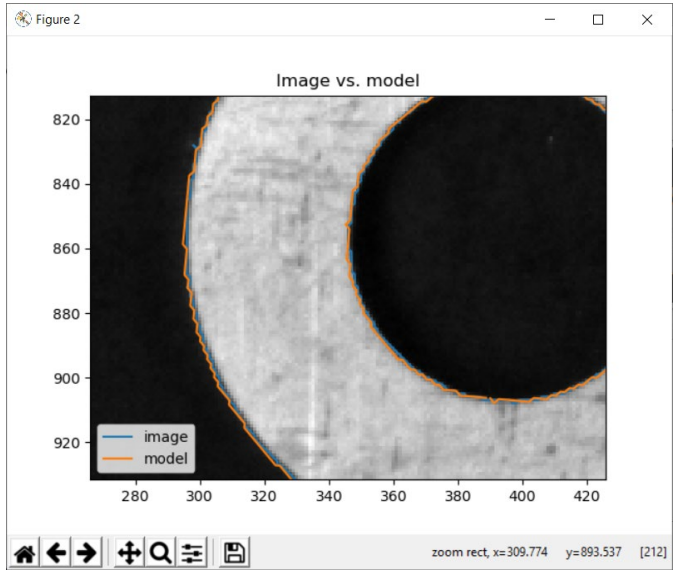
Measurement Data Aspect

- Machine vision







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Thank You

- Thank you for your attention!
- We are open for collaboration
  - Simulations & digital twins
  - VR/AR
  - Robot applications
  - Machine vision & AI
- juha.hirvonen@seamk.fi
- https://www.seamk.fi/en/cooperate-with-us/rdi/