

# NAG

Advancing Your Aerospace & Airport Industry

## AI in Aviation

- AI in manufacturing– national and international collaboration
- Use cases from industry

November 26, 2024

Frits Hoeve  
Manager Innovation Program  
Brainport Industries



**BRABANT  
IS BRIGHT**

**High Tech Systems & Materials in Brabant**

# 100 years of HTSM innovation initiated by Philips

Source

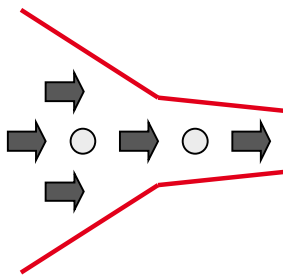


- World wide competition
- Increasing complexity
- Flexibility and agility demanded
- Shorter product life cycles
- Upfront investment for new product development grows
- Pool of technical talent shrinks
- Cost price pressure
- Higher quality levels required



# Innovation organisation

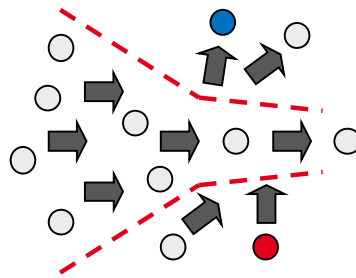
Past decade



Centralized inward-  
looking innovation

Closed innovation

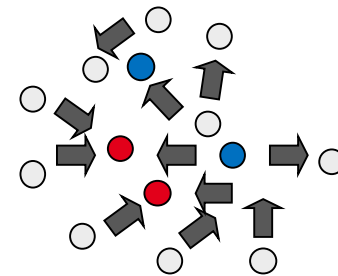
Current situation



Externally focused,  
Collaborative innovation

Open innovation

Next decade



Ecosystem centric,  
Cross-organizational  
innovation

Innovation Networks



# Combining strengths by smart collaboration



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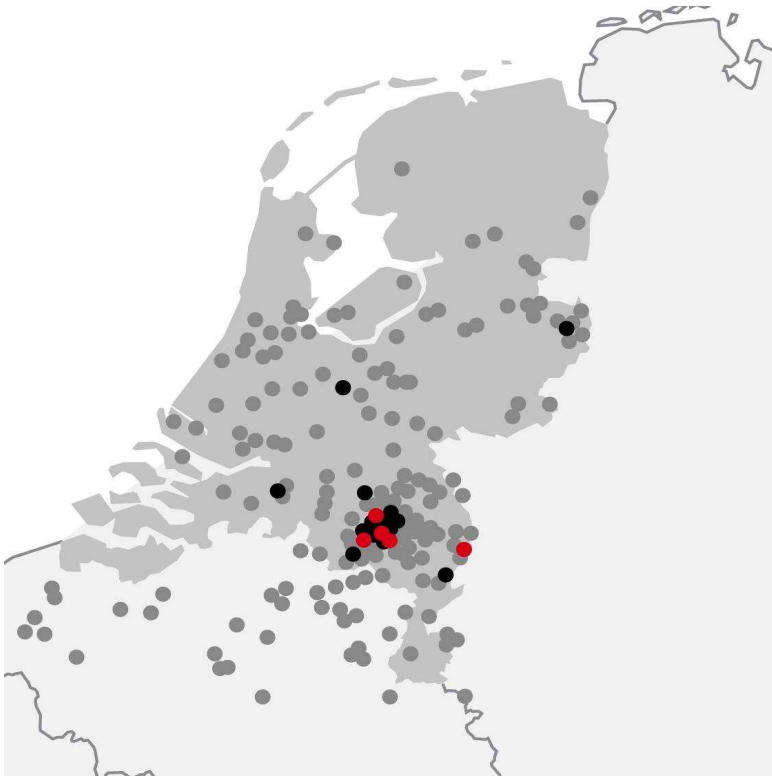
**YOUR HIGH TECH OPEN SUPPLY NETWORK**

# 125 Members – October 2024



**YOUR HIGH TECH OPEN SUPPLY NETWORK**

## Based in Eindhoven: home of the hightech supply chain



### 5 OEM's in the Netherlands

- 80% of OEM's in Eindhoven region
- FEI, DAF, Philips & ASML
- Océ just outside Brainport region



### 14 First tier suppliers

- 71% in Eindhoven region
- Bosch Rexroth, Frencken, GIS Europe, GL Group, KMWE, Neways Electronics, Norma, NTS Group, Optiwa, VanBerlo, Prodrive, SKF, VDL ETG, Wilvo



### 320 Second and third tier suppliers

- 34% in Eindhoven region

# Brainport Industries has focus on these primary markets



**High mix – low volume – high complexity**

Semicon



Medical



Analytical



Printing



Energy systems

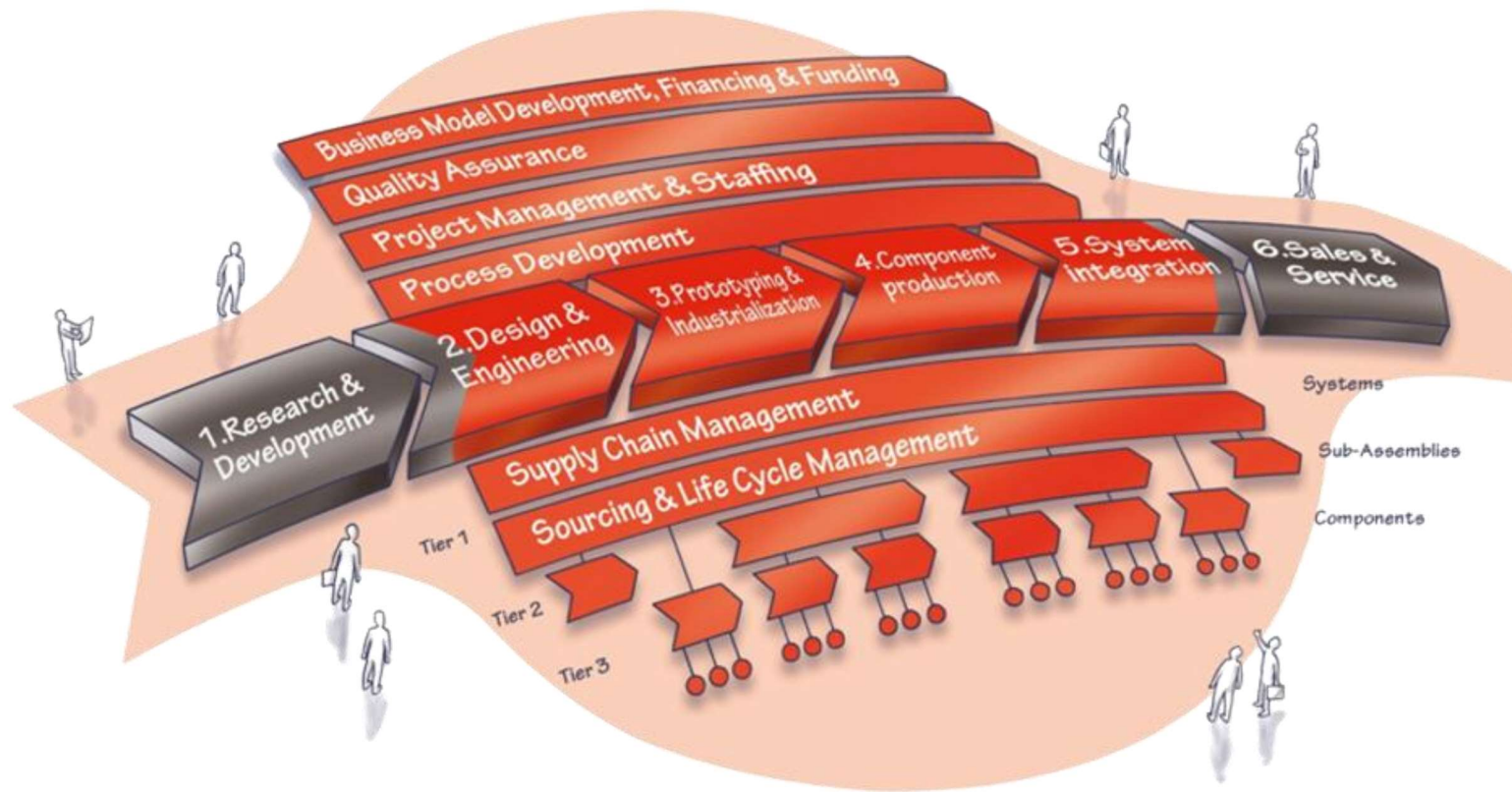


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**YOUR HIGH TECH OPEN SUPPLY NETWORK**

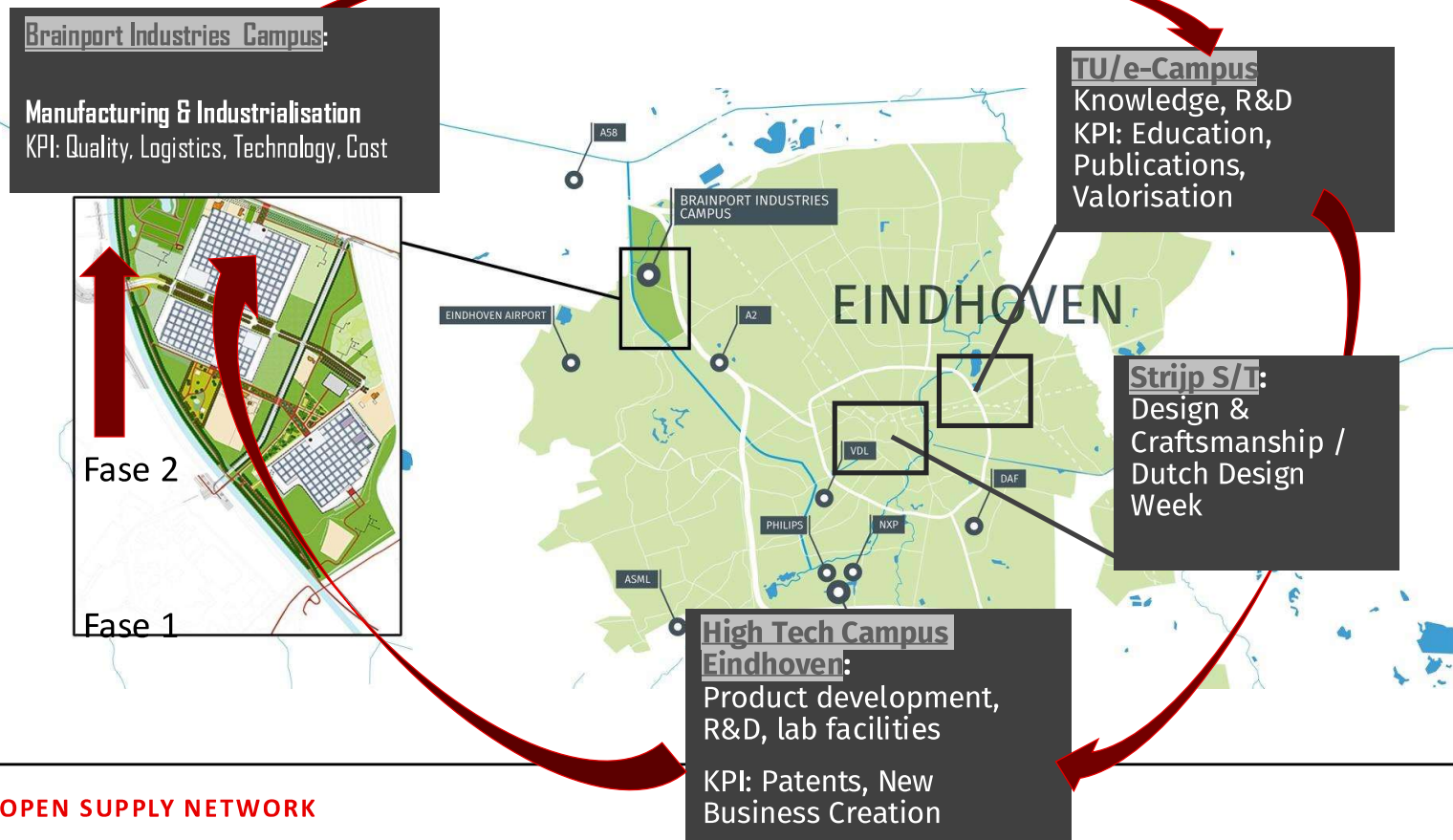


# Brainport Industries Open Supply Network



YOUR HIGH TECH OPEN SUPPLY NETWORK

# Technology Campuses in Brainport Eindhoven



YOUR HIGH TECH OPEN SUPPLY NETWORK

# Brainport Industries Campus

CAPREON

S::DK



KMWE

Brabantse Ontwikkelings Maatschappij  
**BOM**

Provincie Noord-Brabant

**Total Area Campus Park: 200 Ha**  
**Max. Buildings: 65 Ha** (10% /6.5 Ha 100.000 m2 completed BIC-cluster 1 )









# 5 Priorities - Roadmap



COLLABORATION IN INTERNATIONAL PRODUCTION CHAINS



SOCIETAL TRANSITIONS AND SUSTAINABILITY



DIGITALISATION AND PRODUCTION TECHNOLOGY



HUMAN CAPITAL



AVAILABILITY OF GROWTH- AND WORK CAPITAL





empowered by



# Autonomous Factory

Building blocks for autonomous production in a high-mix low-volume environment

[nxtgenhightech.nl](https://nxtgenhightech.nl)







**Simulation of a production line/master Thesis**  
Teun Jansen - Tue - Omron



**Simulation of a production line using Enterprise dynamics**  
Fontys - Omron



**Data collection on a production line**  
Fontys - Omron



**Agriculture, automated sorting**  
Teun Jansen - Tue - Omron



**Operator guidance**  
TNO - Fontys - Faes



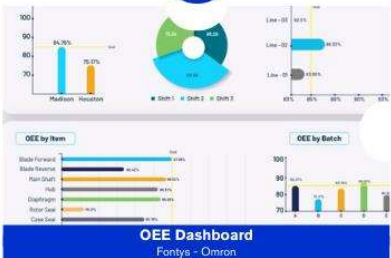
**Connecting ERP with digital instruction systems**  
TNO - Fontys - Supply Drive - Faes



**Advanced data collection on a production line**  
Fontys - Omron



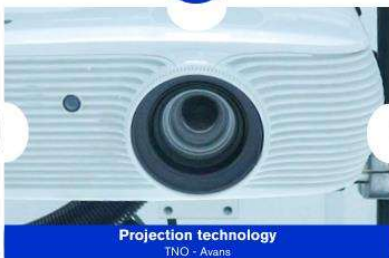
**Advanced simulation of a production line using Enterprise Dynamics**  
Fontys - Omron



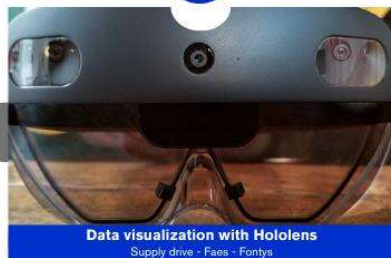
**OEE Dashboard**  
Fontys - Omron



**Collecting tacit knowledge**  
Fontys - TNO - KMWE - NTS - Faes



**Projection technology**  
TNO - Avans



**Data visualization with Hololens**  
Supply drive - Faes - Fontys



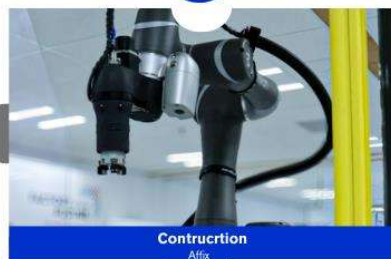
**Operator of the future**  
Affix



**After pick**  
Affix



**Cycle time**  
Affix



**Conctruction**  
Affix



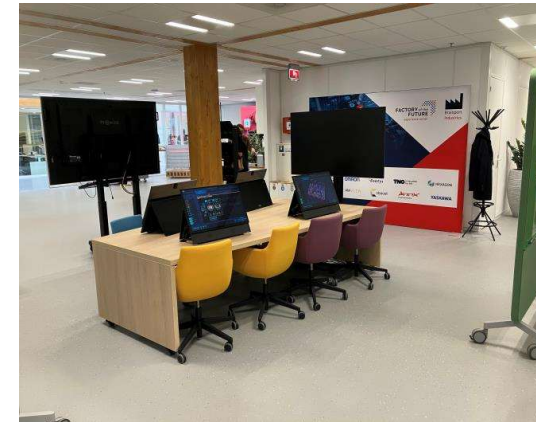
# Prototype factory in Experience Center

Use existing demonstrators to collaborate, interact and become part of prototype factory

Owners asked to "open" up their setup if feasible

Basis for research, development, student assignments, integration and demonstration

Demonstrators will stay "independent"





Dynamic factory planning minimizing resources

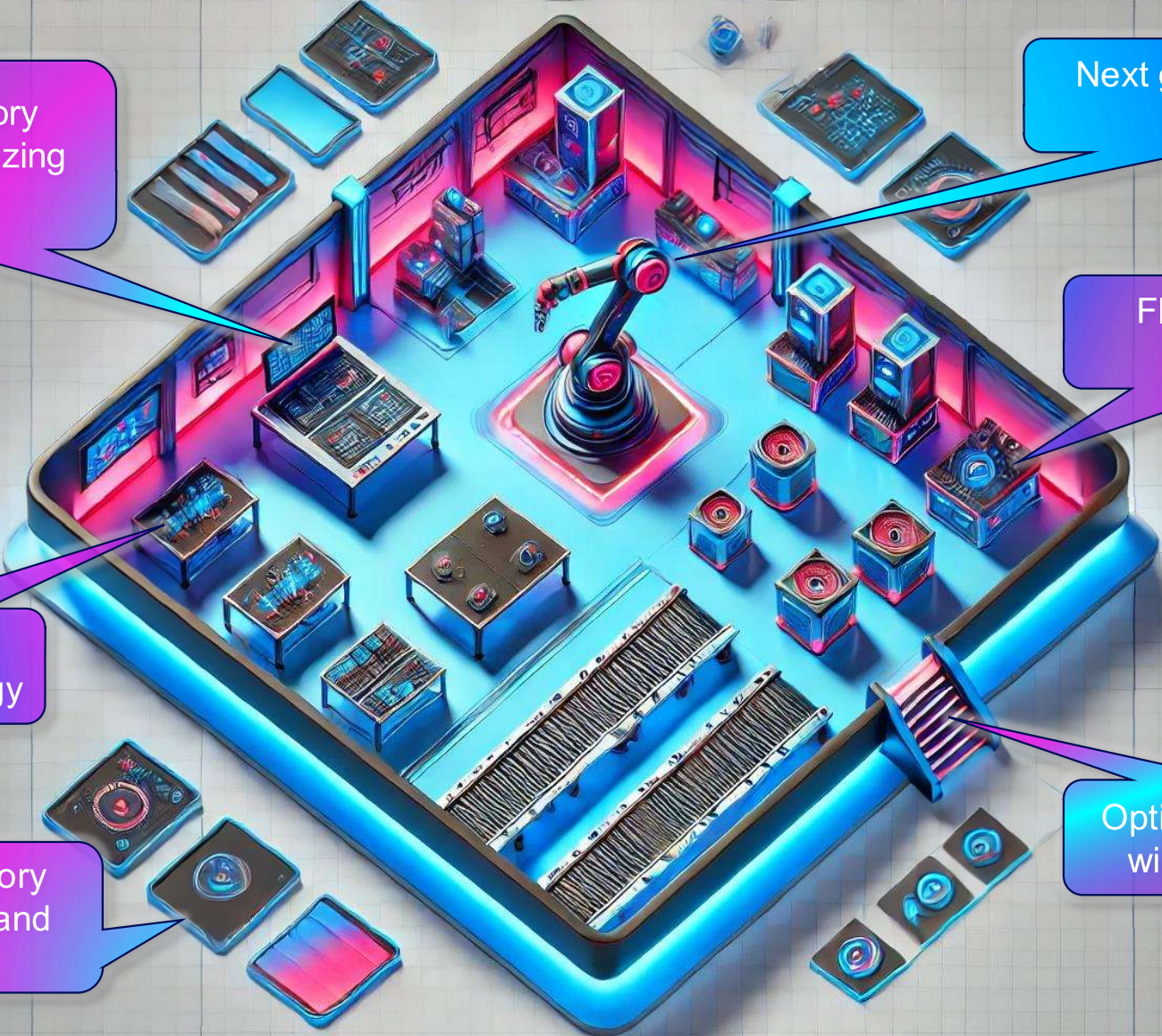
Next generation bin picking

Flexible robot for HMLV

Human centered assistive technology

Insight in factory performance and actions

Optimized integration with AGV logistics



# Klikopmorgen in a nutshell



- ✓ **Klikopmorgen supports SME make- and maintenance industry with digitisation**
- ✓ **Focus on equipment man., agrifood, semicon, automotive, medical, proces**
- ✓ **NL: 5 EDIH's, part of an EU netwerk (>200)**
- ✓ **EDIH Zuid-Nederland accesible via: [Klikopmorgen.nl](https://www.klikopmorgen.nl)**

# Support based upon your challenge?



Ik wil een betere  
aansluiting met de klant

Klanttevredenheid

Ik wil minder  
fouten maken  
in mijn  
productie

Produceren

Ik wil meer  
produceren  
met minder  
mensen.

mensen

Ik wil meer  
processen  
automatiseren

Automatiseren

Ik wil een hogere  
medewerkerstevredenheid

Mensen



# Schakel ons gerust in voor:



Dit zijn onze  
financiers  
en partners:



**Gefinancierd door:**



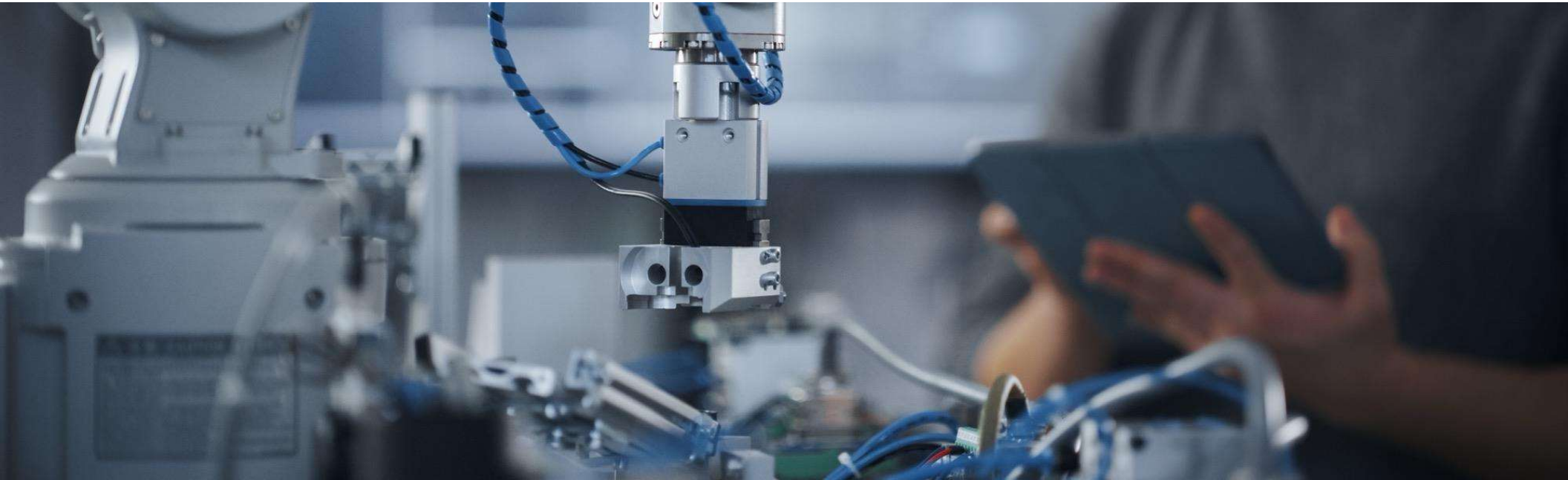
**Partners van EDIH Zuid zijn:**



# INDUSTRIAL REVOLUTION







# AI in MANufacturing TesTing and ExpeRimentation facilities for European SMEs

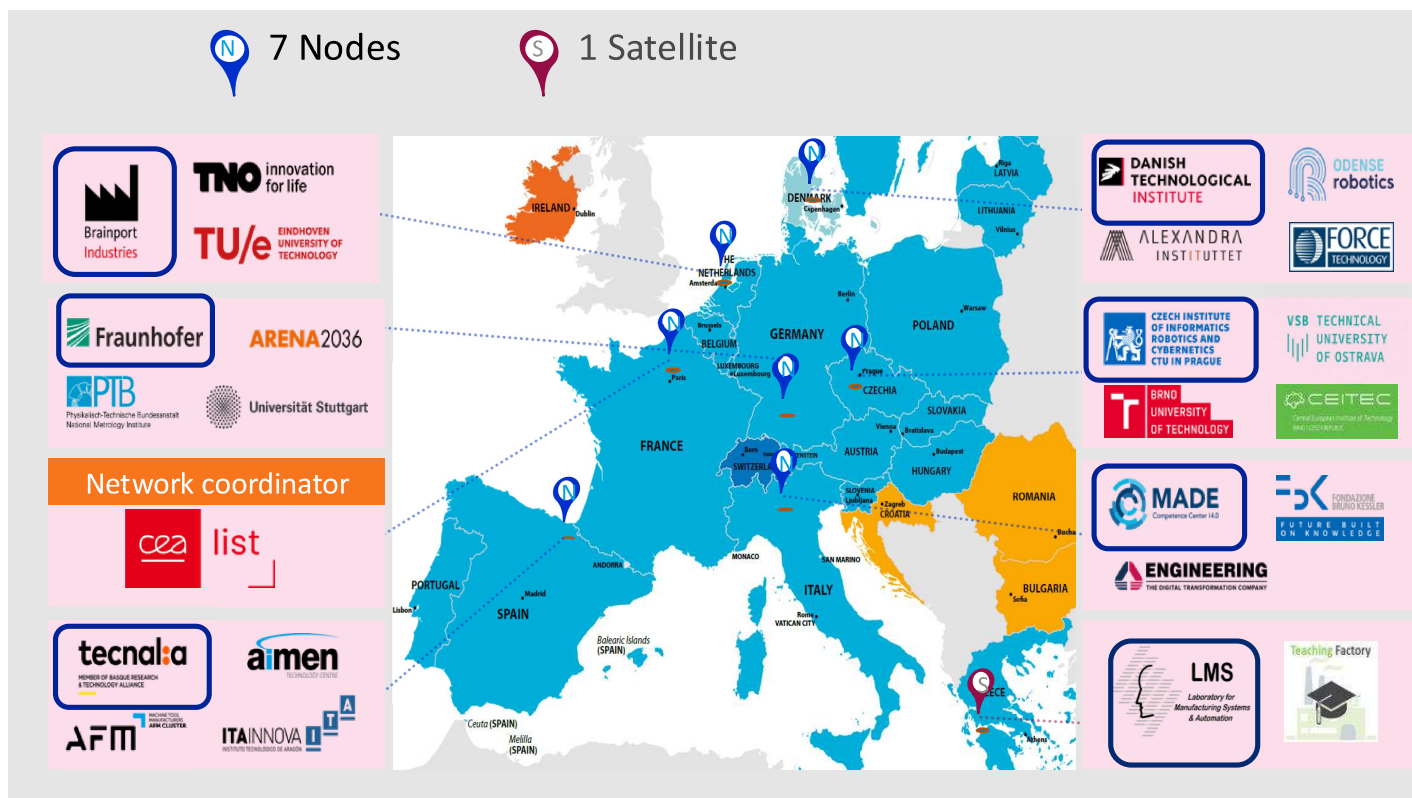
AI-Matters - The Manufacturing TEF

*David Servat*



Co-Funded by the European Union, under grant agreement number 101100707. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Directorate-General for Communications Networks, Content and Technology. Neither the European Union nor the granting authority can be held responsible for them.

# AI-Matters is a network of testing and experimentation infrastructures dedicated to the manufacturing sector



- 4 Challenges
- 50+ Topics
- 140+ Services
- 8 locations
- 25 partners

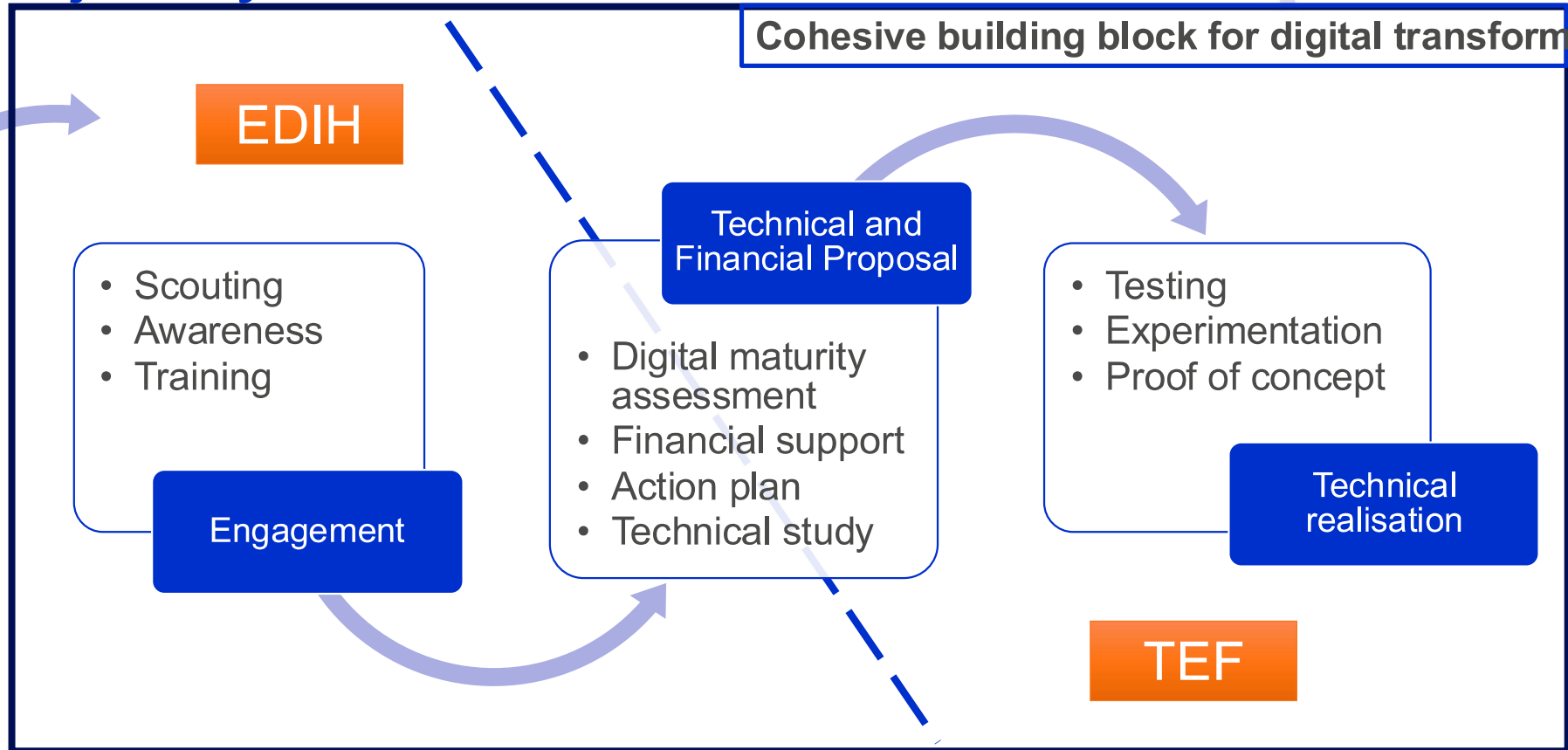






# Customer journey and articulation EDIH-TEF

Cohesive building block for digital transformation



# Challenges in manufacturing that AI-Matters addresses



## Human-Robot Interaction

Creating efficient, safe collaborations between workers and robots to increase productivity, reduce error rates and improved worker safety



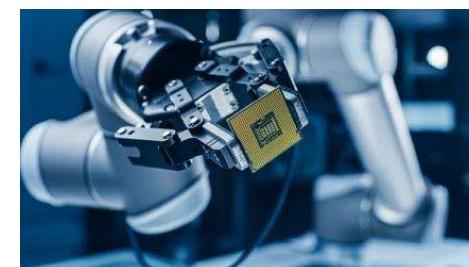
## Factory level optimization

Leveraging advanced technologies and process improvements to streamline operations towards enhancing efficiency, minimizing waste, and boosting productivity



## Circular economy

Minimizing waste and making the most of resources, designing products for longevity, reuse, and recyclability, developing sustainable production processes



## Other upcoming and enabling technologies

Integrating innovative tools and systems that support and enhance manufacturing processes and facilitate smarter production, supply chain efficiency and product innovation

As an outcome TEFs provide annotated and qualified data for R&I on Generative AI

# INDUSTRIAL REVOLUTION



**AFFIX**  
ENGINEERING

BRING  
CREATIVE  
PROJECTS  
TO **LIFE**

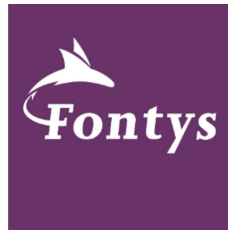


**OPERATOR** of the  
**FUTURE**

**FACTORY** of the  
**FUTURE**  
experience center

Combining modern technologies with the flexibility of a robot





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- 
- 

*“Acoustic based Roller bearing condition monitoring (asset health monitoring)”*



# Challenge: casting equipment from Tata:

Tata Steel IJmuiden: Continuous casting of steel at a high tensile strength at 1.600 °C



## Continue Casting Machine 23.

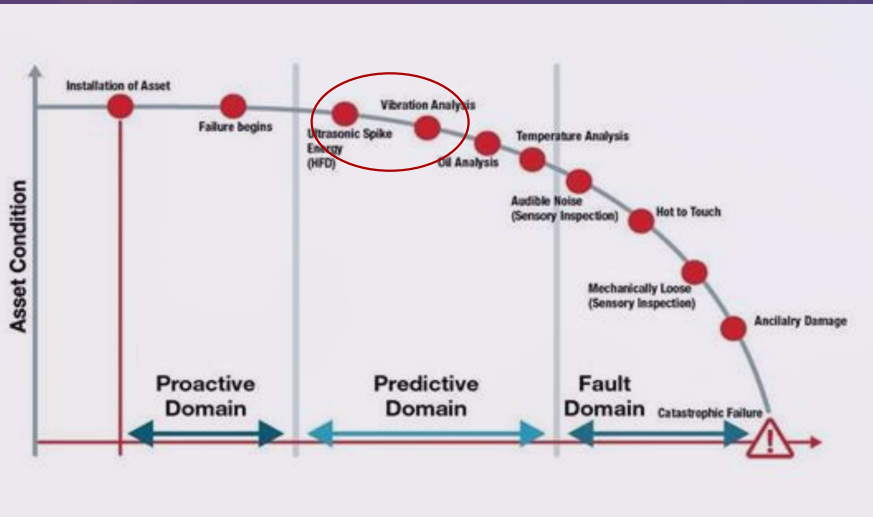
- 2 strengs with 14 segments.
- 7 unique segmentes.
- 212 rollen per strand
- 14-16 rollen per segment
- Hoogte: 19m
- Lengte: 30m





> FOR SOCIETY

# IJSSEL – SORAMA/FLUKE ACOUSTIC BEARING MONITOR USING THE SV600 ACOUSTIC CAMERA



## Opportunity

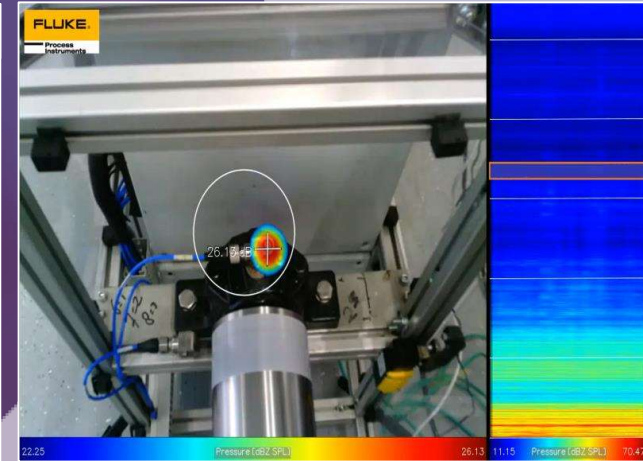
Currently, roller bearing failures are detected using vibration sensors on critical rollers.

Research is being done to improve the failure detection capabilities by use of a sound camera.



## Upsides acoustic camera approach

- Acoustic cameras can detect leaks, mechanical wear and other anomalies
- Can be used to integrate with robots like BD SPOT or drones for autonomous inspections
- Sensor is contactless



## Partners



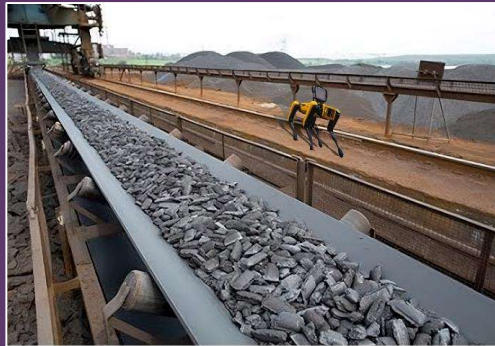
Student research



Acoustic cameras



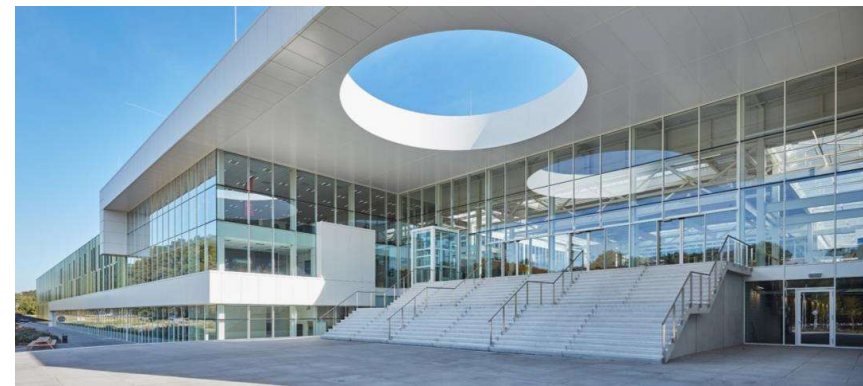
Data analysis & maintenance





## Role of the Fieldlabs

- Regional Meeting Points where Top Technology, Education and Government come together under one Roof
- Sharing Facilities, access to Technologies and exchanging Specialist Knowledge
- Application Areas for Technology and Industry Solutions



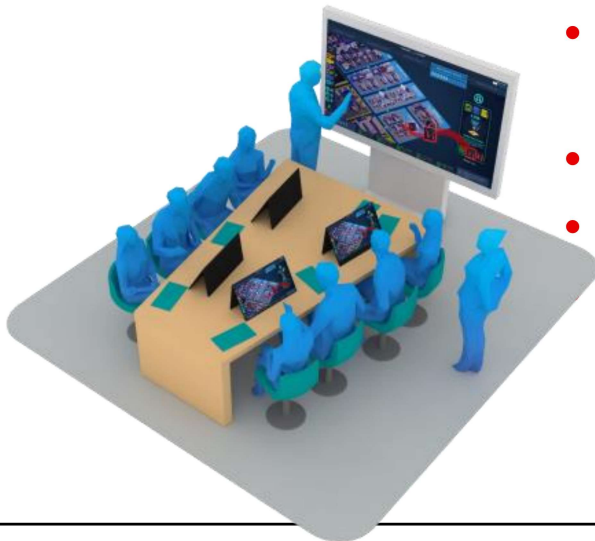
# Digitalisatio & production technology

Check the QR-Code:

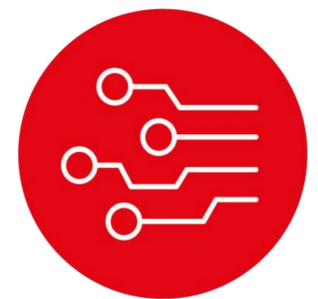


## Factory of the Future Serious Game

Experience the challenges and dilemma's of digital transformation of the high tech industry in a serious game workshop format.



- The transformation process towards Industry 4.0 en experience the complexity of thing.
- Learn by doing: experience the endless possibilities!
- Make a start with implementing in your own organization.



**Thank you for your attention!**

**Contact info:**

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**Brainport  
Industries**