Sustainable Industry X. Teollisuuden ja tutkimus- ja koulutusorganisaatioiden yhteistyö – Infrat työkaluna

12.11.2024

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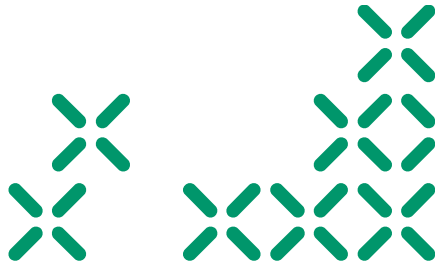
Industry X

Sustainable Industry X (SIX)

Supercharging Finland’s industry performance through innovation and knowledge



Target: Competitiveness[2] by making good plans come true

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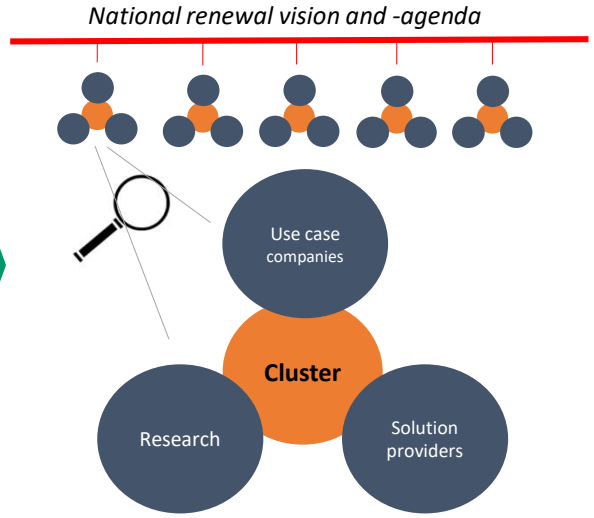
Sustainable Industry X (SIX)

***SIX DNA:** harnessing and connecting the existing elements, industry driven agile collaboration.*

GUIDING LINE

Unifying, national vision and agenda for industry renewal

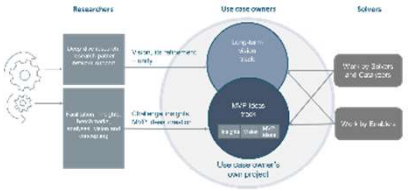
- Enabling play towards one common goal. Increased long term predictability in Finnish operating environment.



AGILE IMPLEMENTATION

Collaborating, smartly specialized ecosystems/clusters implementing the agenda

- Industry needs as a starting point in all activities. Themes: innovation, capabilities and operational efficiency
- Examples under SIX umbrella: clusters for **Mobile Work Machines, Smart Manufacturing, Heavy On-road, SIXNET**



Best practices in co-creation

Infrastructures for innovation- and competence development

APPROPRIATE TOOLS

Appropriate, effective tools

- Focusing on what is essential for industry. Agile implementation, taking things one step further than usual.

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Miksi?

Infrat ja niiden merkitys

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Case

SIX Mobile Machines – building future mobile machines together

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Global players …





PONSSE EPEC SANDVIK Kalmar VALTRA IONCOR





normet TANA Danfoss NOKIA Junttan HEVTEC

Lumikko emblica GOFORE VTT DIGISALIX Tampere University Tampere University of Applied Sciences ABB GIM ROBOTICS tke

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… with shared vision …

The best operating environment
‘In 2025, Finland has become
known as the world's best place for developing mobile
work machines and their key technologies and services.’

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…and joint objectives.

1.

Efficient and effective joint innovation development

‘Together we are enabling the realization of company-specific and sector-wide ‘digital green’ goals. Along this journey, the cluster enables resolving difficult and time-consuming problems efficiently in close collaboration of industrial players and research actors. Everyone can pick fruits from this result basket and utilize them for their own purposes.’

2.

Developent of competence and availability of talents

‘By jointly identifying the future competence and industry focus areas, we are enabling the continuous availability of the skills and capabilities needed by companies. We are also doing educational development on this basis.’

3.

Visibility and impact in Finland and all around the world

’Together we will create better visibility of mobile work machine builders in Finland and globally. We will do this order to attract investments and the world’s best experts to Finland. Together we influence funding, standardization and other decision making.’

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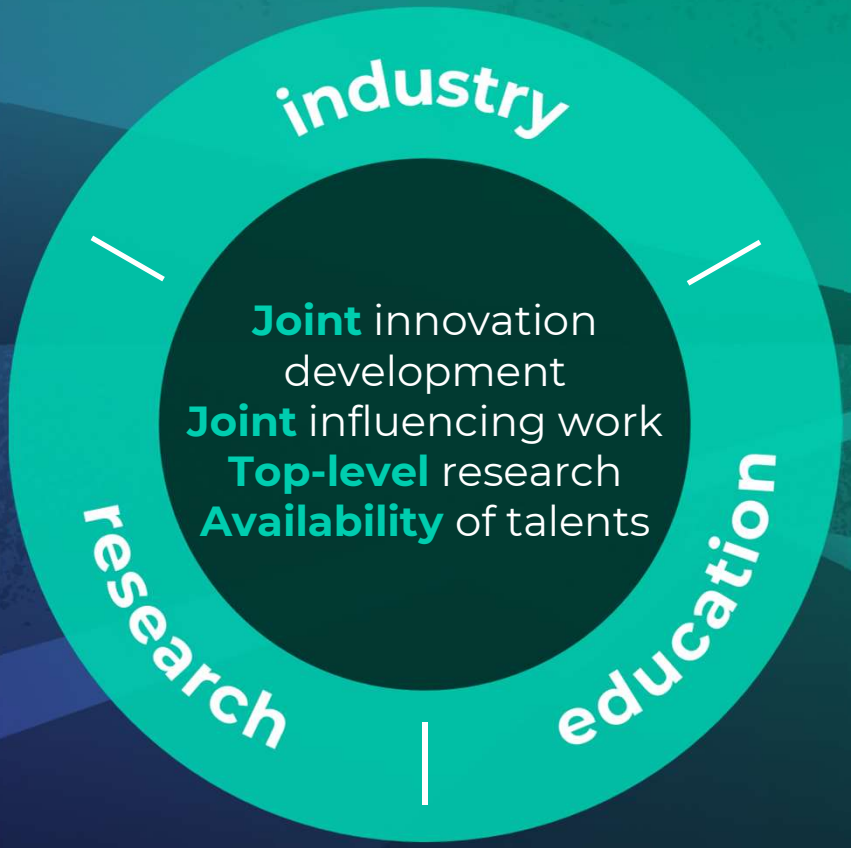
... creating the future together.



2020 DRIVERS

- **Resilient operations**
- **Sustainable productivity**
- **Accessible data and knowledge**
- **Proven sustainability**

2030 VISION

- **World's best place for developing mobile work machines**
- **Unseen value from digitalization and sustainability**

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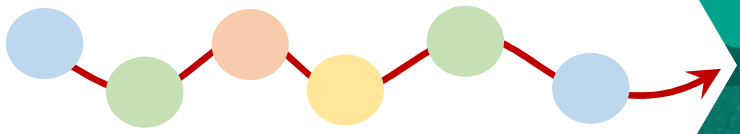
The roadmap

Grand challenges

Industry: Picture of smart mobile work machine 2030

2021 *2022 - 2025* *2026 - 2030*

Continuum of joint innovation and competence development activities



Joint objectives

Research: Research needed to realize smart mobile work machine 2030

2021 *2022 - 2025* *2026 - 2030*

The mobile machine of 2035

FUTURE MOBILE MACHINES ARE MISSION-DRIVEN, ENABLE SEAMLESS OPERATIONS AND DELIVER NEW, UNSEEN VALUE ACROSS THE VALUE CHAIN. SUSTAINABILITY IS BUILT INTO

EMBRACING AUTONOMY

- The level of autonomy ranges from full autonomy to driver assistance systems depending on the application (open/closed environment).
- Autonomy is extended from machine level to mission-driven fleet autonomy.
- Autonomy increases the efficiency of the whole operation process.

ELECTRIFICATION ENABLES ZERO-EMISSION OPERATIONS AND NEW VALUE

- Electrified machines produce no emissions and are efficient, safer and more reliable.
- The fit-for-purpose design offers precise functionalities and improved performance.
- As a result, machines no longer limit their function.

HUMAN IN THE LOOP - BETTER JOBS

- As machines and systems become smarter, people are freed from monotonous work and can focus on more complex tasks that require decision-making skills.
- As a result, work becomes more meaningful and motivating. Employees suffer from less stress and fatigue and their cognitive load decreases.
- A whole new level of safety is achieved. Intelligent, integrated safety systems allow people and machines to work safely in the same area.
- Work is no longer location-specific thanks to remote operations and increased levels of autonomy.

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SIX Mobile Machines is an industry driven cluster of Finnish mobile machine manufacturers and their key technology providers.

CONNECTED AND COMMUNICATING

- All is connected: Mobile machines operate as efficient, autonomous teams, interacting with each other and exchanging information in real-time in a highly systemic environment.
- All machines are connected to operations management systems and operated with minimal human interference.
- Operations centres have a complete overview of the sites and operational data at all times.
- Ultra-reliable, low-latency connectivity enables high levels of autonomy and maximises the efficiency of operations.

INTELLIGENT CONTROL SYSTEMS AND BETTER DECISION-MAKING

- Decentralised AI enables autonomous decision-making also on a machine-level.
- Information is processed and refined on the machines before it is shared.
- Machines optimize their performance and routines autonomously based on perceived data and information.

LEVERAGING DATA FOR NEW BUSINESS OPPORTUNITIES

- Maintenance needs are predicted and services optimized using data throughout the entire life cycle of the machines.
- Machines are transparent in terms of condition and cost. Open interfaces enable data sharing.
- Each machine has a digital identity for full traceability of lifecycle services, re- and de-manufacturing, recycling and novel value adding services.
- Focus is on results instead of machines and services – that is what customers are paying for.
- Machine-generated data creates new business opportunities and added-value.

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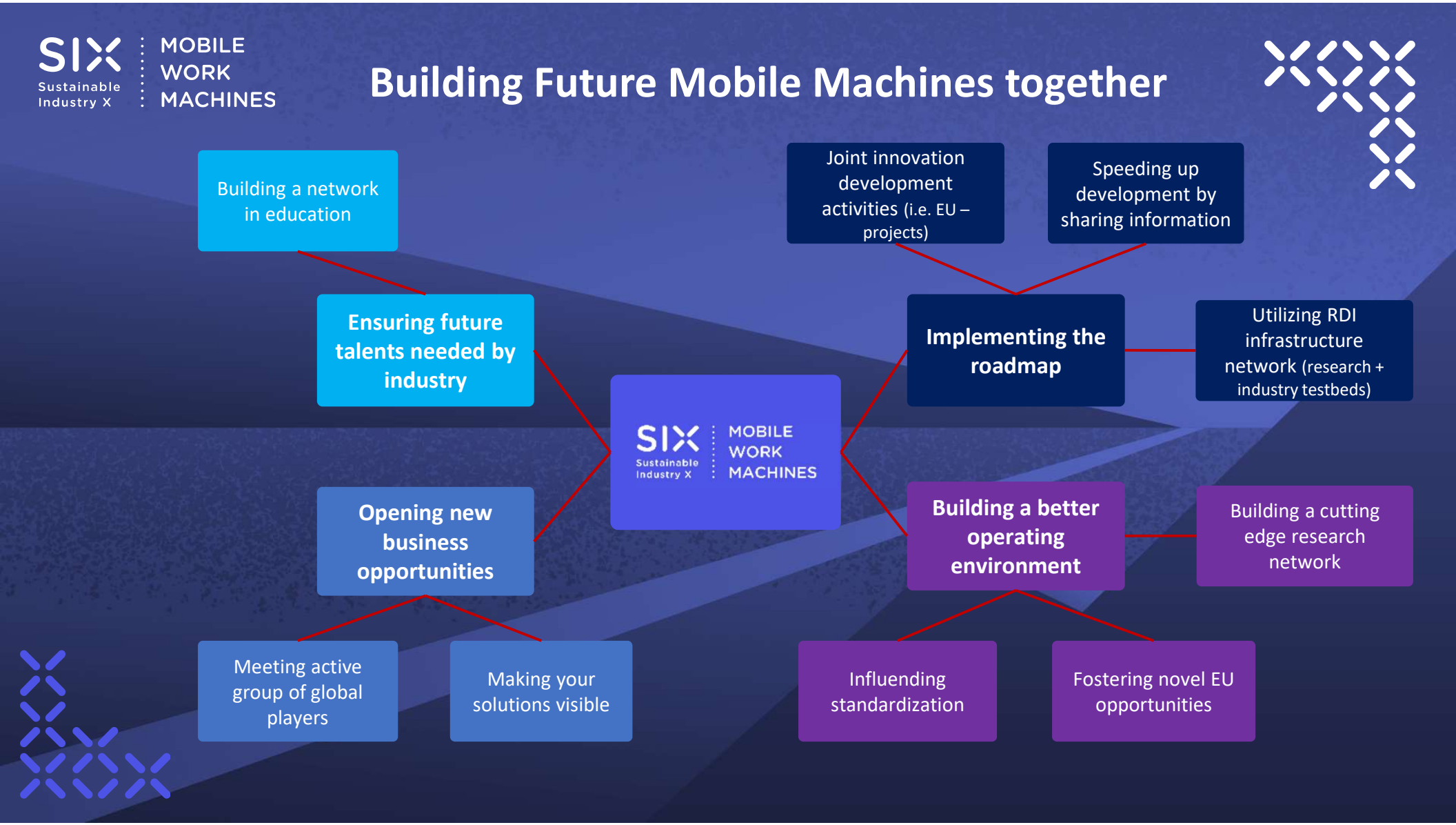
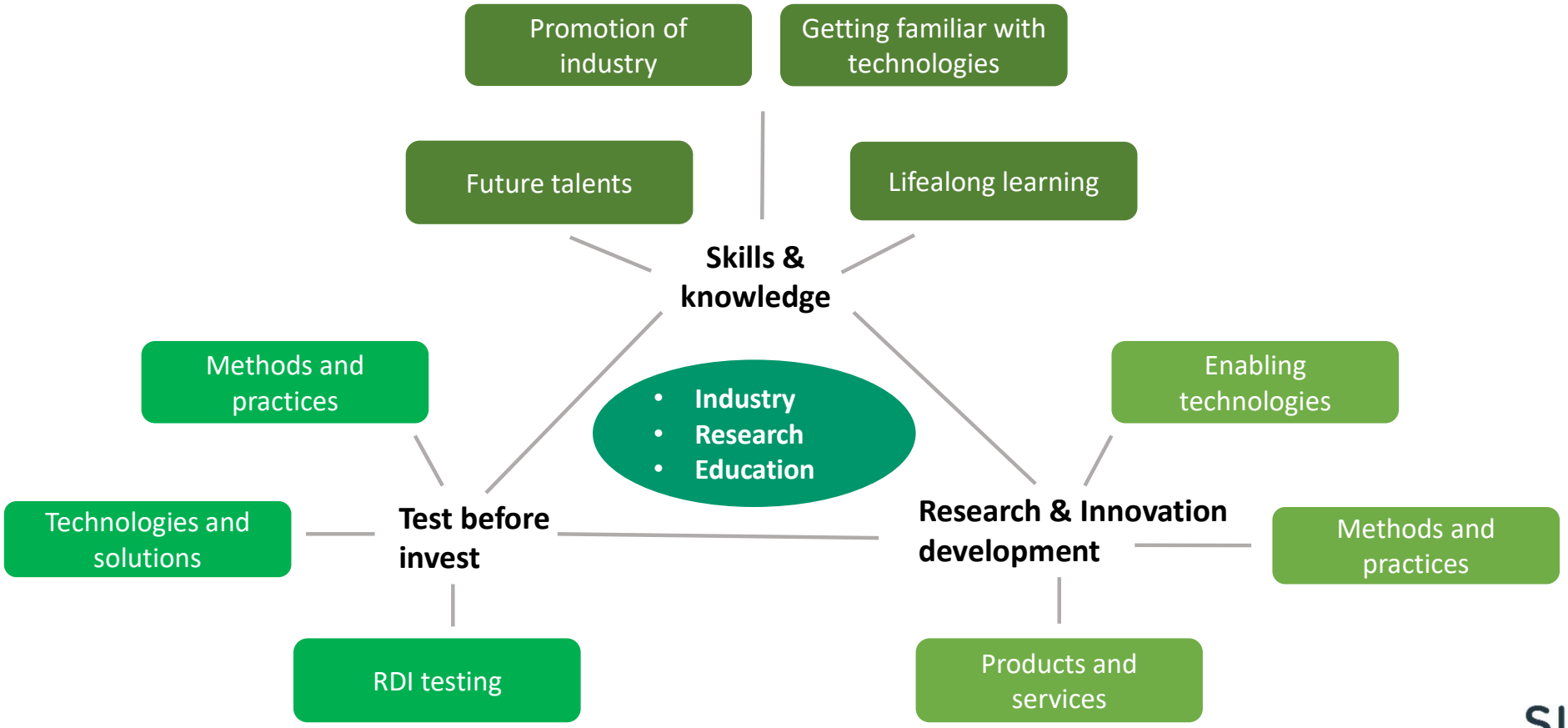
Building Future Mobile Machines together



The big picture of infra related needs



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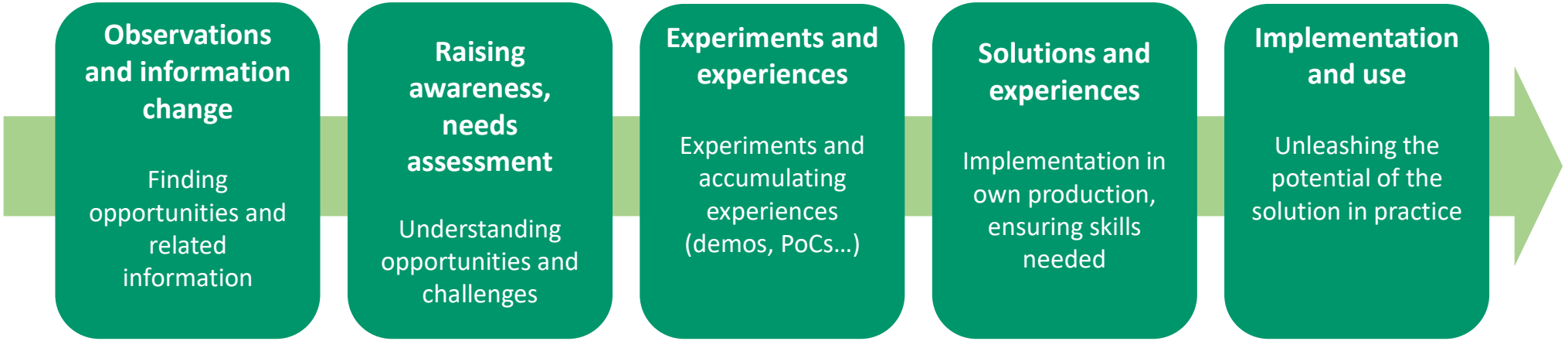
Industry perspective – the journey to be covered

Active, business-oriented guidance through the customer journey



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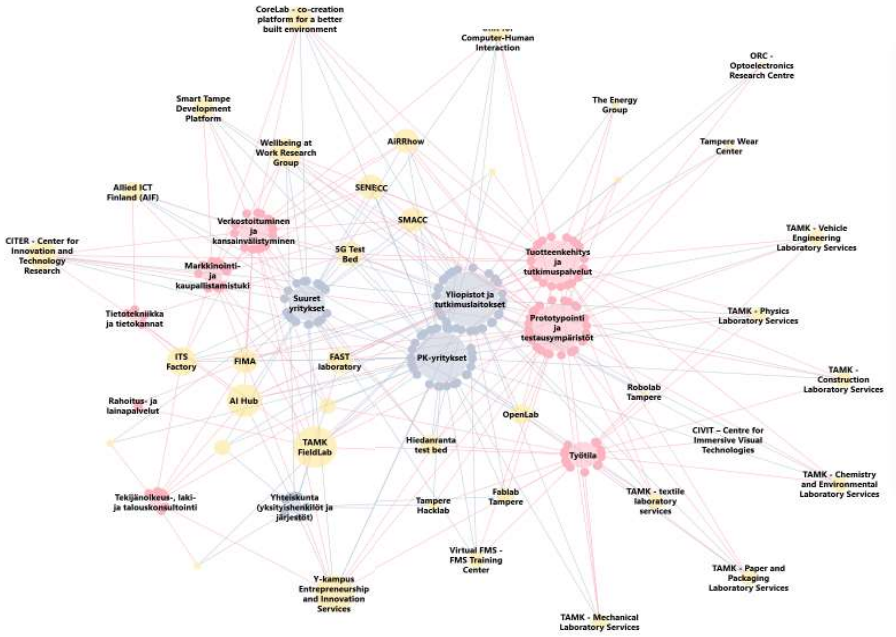
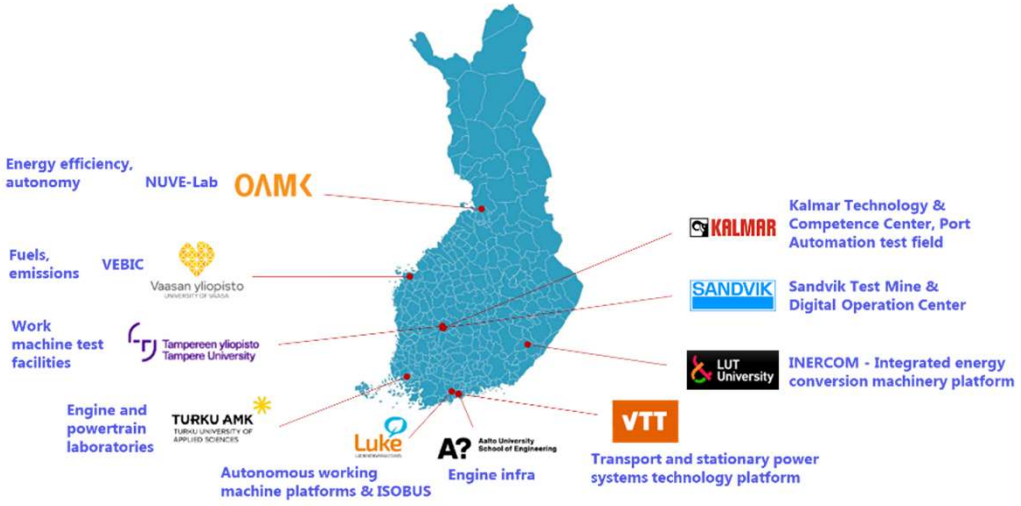
Miten?

Työkalujen ja työkalupakin kehittäminen

Olemassaoleva hyvä…





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… ja sen hyödyntäminen

Olemassaolevan infravarannon hyödyntäminen ja edelleenkehittäminen. *Meillä on paljon hyvää. Ei lähdetä liikkeelle tyhjältä paperilta ja rakenneta tarpeettomia 'uusia seiniä'.*

- Infroilla teollisuustarvelähtöiset, per infra yhteensopivat käyttötarkoitukset
- Infroilla on toiminnallinen ydin, johon tutkittavat/demonstroitavat teknologiat kytkeytyvät
- Selkeän palvelutarjoaman ja –rajapinnan muodostaminen infroihin
- Infrojen tuottama avoin data varantona ja vastaavasti verkottaessa syntyvät uudet infrat
- Infroihin linkittyvät tukevat virtuaalimaailman toteutukset
- Verkottaminen, avaaminen, näkyvyys
- Verkostojohtamisen ja -ohjauksen mallit käyttöön

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Työkalujen ja työkalupakin kehitys

Strategiatason tavoiteasetantaa

Kehittämisympäristöt ja infrastruktuuri

Tekoäly 4.0 -ohjelman tavoiteiden toteutuminen edellyttää kehittämisympäristöjen luomista, jotka mahdollistavat teknologia- ja liiketoimintakokeilut. Hyviä esimerkkejä tästä ovat esimerkiksi erilaiset korkeakoulujen infrastruktuurit ja niihin liittyvät soveltavan tutkimuksen hankkeet. Alkaneella ohjelmakaudella myös EU panostaa merkittävästi kehittämisympäristöihin ja luo niistä EU-laajuisia kokonaisuuksia, joissa Suomen tulisi olla mukana.

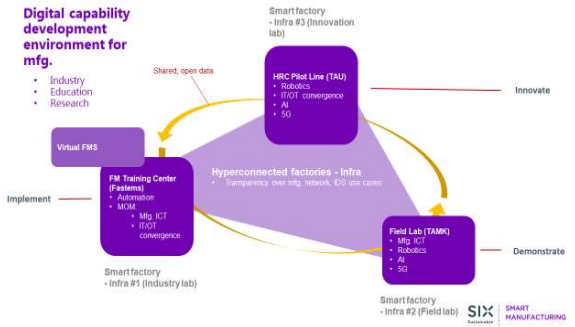
Osaaminen ja tietoisuus	**Toimenpide 4.** Työ- ja elinkeinoministeriö järjestää kokeiluympäristöjä avoimesti tai kaupallisesti tarjoavien toimijoiden **pyöreän pöydän keskustelun ja käynnistää tämän pohjalta kokeiluympäristöjen ja niiden käsittämän infrastruktuurin ja palvelujen kansallisen kartoituksen ja arvioinnin.** Tämän tavoitteena on, että teollisten pk-yritysten tietoisuus kokeiluympäristöistä vahvistuu ja ympäristöjen käyttö pk-yritysten keskuudessa kasvaa: • Osana kartoitusta valmistellaan kokeiluympäristöjen kansallinen **palvelutarjontakartta** sekä kokeiluympäristöjen **yhteinen pelisääntökirja.** • Toteutetaan tarjontakarttaan perustuen kokeiluympäristöjen tunnettuutta teollisissa pk-yrityksissä vahvistava **viestintäkampanja,** joka keskittyy kokeiluympäristöjä hyödyntäneiden pk-yritysten kokemusten esiin tuomiseen.

Laajemman hyödyttävyyden mahdollistaminen - Pelikirja

Näkyvyys

https://www.six.fi/sixlabs

Käytännön infrakehitystä



eSmartMachines (EAKR)

- **eSmartMachines** -hankekokonaisuus käsittää kehityshankkeen ja siihen kytkeytyvän investointihankkeen (1.8.2021 – 30.6.2023).
- **Päätoteuttaja** Tampereen ammattikorkeakoulu ja **osatoteuttaja** Tampereen yliopisto
- **Päätavoitteena on muodostaa ja kehittää Pirkanmaalle sähköisten älykkäiden liikkuvien työkoneiden ja hyötyajoneuvojen osaamiskeskittymää kokoava verkottunut TKI- ja demonstraatio -testbed sekä toteuttaa yrityksille kattavat demonstraatiot ja workshopit tässä ympäristössä.**

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Kiitos!

www.six.fi

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