

# AB Smart DIH -the vision

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BioTalks Jan 21st 2022

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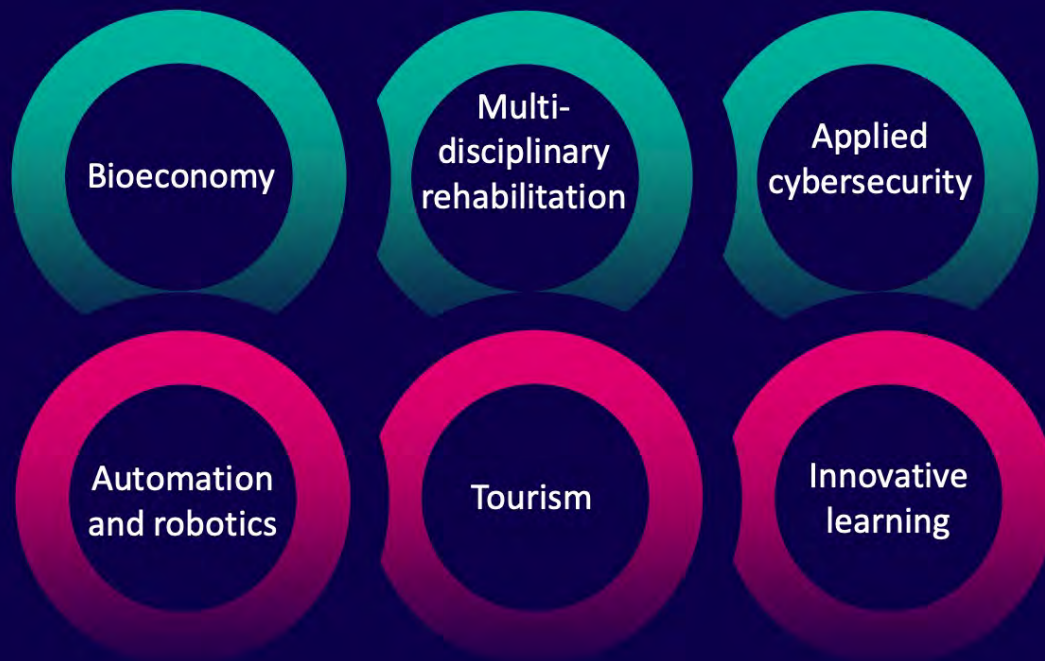
# Who are we?

[www.jamk.fi](http://www.jamk.fi)

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# Focus Areas



JAMK's focus areas are based on the needs of the operating environment. They compile the expertise to form competitive centres of excellence.

The focus areas are a multidisciplinary combination of several areas of expertise at JAMK.

The focus areas are growing and known both at the national and international level.

Each of them also has a significant educational task, focused RDI activities and professional service business activities.

A microscopic view of plant cells, showing green chloroplasts and cell walls, with a blue and green color gradient background.

# Bioeconomy

Towards ecologically sustainable and wise use of resources.

JAMK is a developer of business and promoter of export activity within bioeconomy. It creates new material economy and circular economy saving natural resources. Several areas of expertise are connected to bioeconomy (e.g. forestry, agriculture, industrial management, energy production, business economics and tourism).



## Contact information

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JAMK UNIVERSITY OF APPLIED SCIENCES

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# Topics

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# Topics:

Smart Farm, Living Lab

Data acquisition (field operations, water management, drones, XG)

FMIS, data ownership, openness

Cyber security of the food system

Smart energy solutions

Situational awareness

DIH

...

# Smart FMIS (Farm Management Information System)



Situation Awareness  
Informed Decisions  
Ease of use

Site-specific measurement &  
control  
Automated documentation  
User-Centred Design

...





# Virtual Reality / Simulation

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## Digital twins in smart farming

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**Keywords:**

- Smart agriculture
- Internet of things
- Farm management systems
- Remote sensing and control
- Virtualization

ABSTRACT

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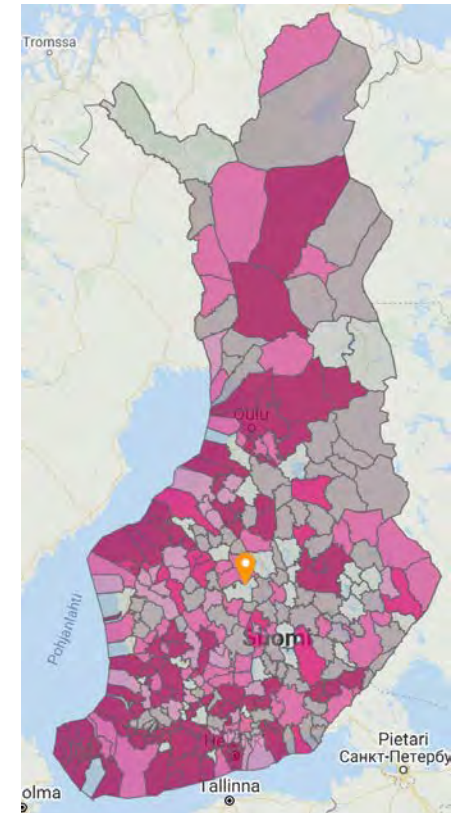
Digital Twins are very promising to bring smart farming to new levels of farming productivity and sustainability. A Digital Twin is a digital equivalent of a real-life object of which it mirrors its behaviour and states over its lifetime in a virtual space. Using Digital Twins as a central means for farm management enables the decoupling of physical flows from its planning and control. As a consequence, farmers can manage operations remotely based on (near) real-time digital information instead of having to rely on direct observation and manual tasks on-site. This allows them to act immediately in case of (expected) deviations and to simulate effects of interventions based on real-life data. This paper analyses how Digital Twins can advance smart farming. It defines the concept.



# Data Transfer



Wireless  
Pop-Up networks  
XG  
IoT



# Site-Specific Control Variable Rate Application





# The vision

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# Smart Agriculture/Bioeconomy?

- Smart Agriculture and Bioeconomy utilise **new technologies and analytical methods** in order to make these processes more **profitable and productive** but also filling the requirements of the **resource-, environment-, and climate-smart** goals



Green Deal

Farm to Fork

Data Strategy

etc.

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# AB Smart DIH

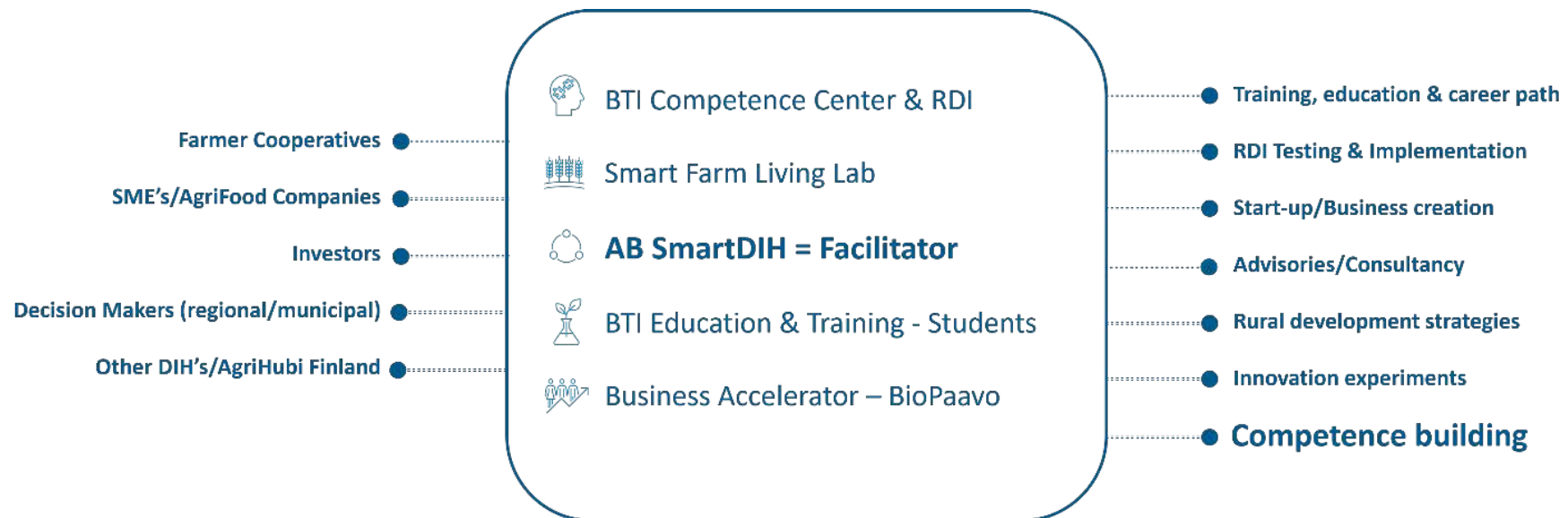
Digital Innovation Hub for Smart Agriculture and Bioeconomy

- **Vision:** a multidisciplinary digital innovation HUB in Smart Agriculture / Smart Bioeconomy, providing:
  - Multi-Actor Approach (**MAA**): meeting point of farmers, companies, end-users, researchers, developers, students, educators
  - **Competence Center** of related applied research
  - International testing / piloting environment for research and development, **Living Lab**; Tarvaala **Smart Farm services**
  - **Jamk/BTI: Leading educator** of Smart Agriculture and Bioeconomy
  - **Speeding up innovation uptake**

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# AB Smart DIH

Services and deliverables are based on the identified needs of stakeholders and decision makers



**Sustained Digital Transition & Sustainable Development of Rural Areas**

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# The actions

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## How do we do it?

- In order to implement our strategy, we apply a **multi-actor approach** throughout our services, by **integrating the key target groups**, thereby giving special attention to the integration of **students and young talents** into the process. Actions will include **match making and brokerage events** involving students, agrifood stakeholders, farmers and researchers, aiming to form win-win synergies.

Including this event!

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# Smart Farm & AB SmartDIH development (2021-2023)...

- **AB SmartDIH** Digital Innovation Hub of Smart Agriculture (funding from [Smart Agrihubs](#))
- SF/SB **Living Lab**
  - Testing SF technologies in real farm environment,
- **'SmartXG'** (Horizon Europe)
  - 17 partners
  - Tarvaala Smart Farm / farms nearby as a Use-Case for remote last-mile application of XG (4G, 5G) and other high-capacity data transmission technologies
  - New business & livelihood development to rural areas





# Smart Farm & AB SmartDIH development (2021-2023)

- **Tarvaala Smart Farm** concept (funding from European Regional Development Fund, ERDF)
- Case studies:
  - **Smart acquisition of field parameters.** The effects of practices on the quality and quantity of yield. Creating a holistic view on the success of operations taken during the whole growing season. Comparison of results to the yield potential and soil properties.
  - **Optimising water resources management** utilising 3D modeling and underground wireless sensor network
  - **Last mile communication for autonomous forestry applications.** Utilising 5G pop up networks.
  - Incl. **Cyber Security** testing



# Tarvaala Smart Farm / AB SmartDIH

What services are  
needed?

The best ways for co-  
operation?

Who to include?

How could You  
contribute?