LifeFactFuture

The Networked Life Sciences Factory of the Future

Nokia Veturi LEAD Networking Event

30.10.2025

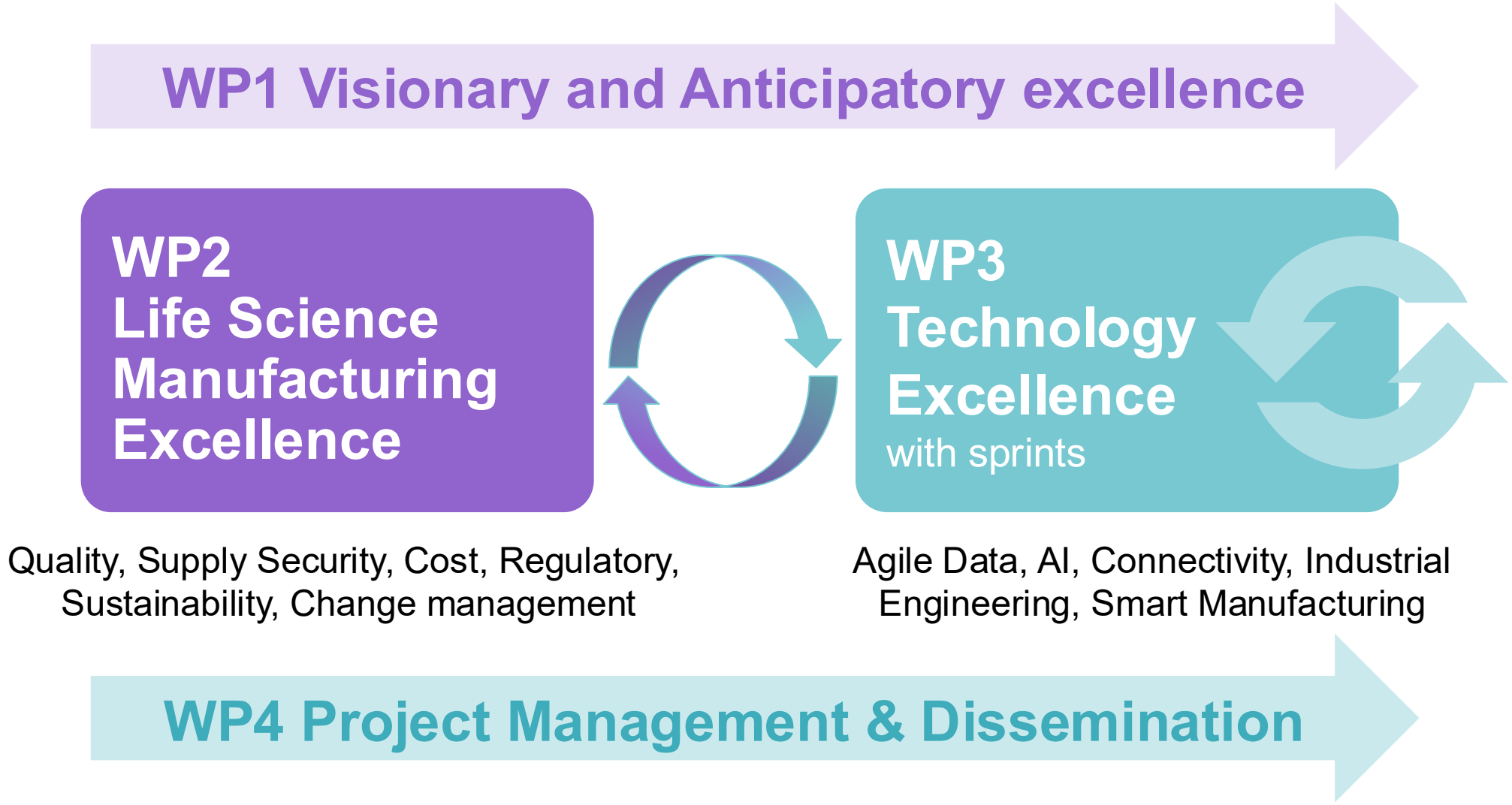
LifeFactFuture (LFF)

is a large consortium project including research teams at the University of Turku and the University of Helsinki, as well as some of Finland's leading life science manufacturers, data and technology companies. Project is funded by Business Finland during 2024–2027. The consortium gratefully acknowledges the funding.


LifeFactFuture's goal is
to accelerate the adoption
of digital solutions and better
use of data, making Finland
a leading location for data-driven
life-science manufacturing.

LFF Approach

LFF Approach



Problem & Why Now?

Transition to Trustworthy AI/ML use

Challenges

Compliance slows innovation

Underused data assets

Competitive risk

Opportunities

EU AI Act & digital transition

Finland’s unique position

Moment for leadership

Highlights from Work Packages

Future Factory Vision (WP1) – conducted environmental and horizon scanning and participatory foresight workshops to co-create the first version of the Future Factory Concept, articulating the consortium's shared vision and ambitions for the future of life science manufacturing in Finland.

AI-Driven Manufacturing (WP2) – screened and demonstrated AI/ML technologies for solid dosage manufacturing, identifying key limitations.

Employees' readiness for digital innovations in manufacturing (WP2) – studied different digital innovations and employees' readiness for implementing them in manufacturing operations

Exploring the Industry's SOTA (WP3) – conducted 22 company interviews to map the state-of-the-art in Data Architecture, AI, and Regulations. Wrote an article, to present in November.

Predictive Maintenance in Manufacturing (WP3) – developed an algorithm to predict the machine failure in the real-life data. Wrote an article, to present in November.

European Journal of Pharmaceutical Sciences
Volume 212, 1 September 2025, 107142

Advancing Direct Tablet Compression with AI: A multi-task framework for quality control, batch acceptance, and causal analysis ☆

Yazid Bounab, Osmo Antikainen, Mia Sivén, Anne Juppo

Temporal Sequence Modeling for Rare Failure Prediction in Industrial Machinery Using a Hybrid CNN-LSTM Model

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Developing the Futures Map Framework – an integrative hybrid foresight approach

Tero Villman & Osmo Kuusi

European Journal of Futures Research **13**, Article number: 14 (2025) | Cite this article

Engineering Data Architectures for AI/ML Integration in Regulated Manufacturing

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LFF Approach

From disconnected systems to a validated digital ecosystem

Ecosystem & Impact

Data Architectures

- Interoperable, secure, and standardized data foundations.
- Building shared blueprints for compliant data use under strict industry regulations.

AI/ML Methods

- Real factory data used to predict quality and optimize performance by the University of Turku.
- University of Helsinki leads pharmaceutical manufacturing use cases (e.g., tablet compression, AI-based process control).

Digital Twins

- Validated AI models and process twins in production.
- Regulatory-aware DevOps for AI and digital twins.
- Generating synthetic data for privacy-preserving, yet accurate AI/ML prediction.

Expected Impact for Nokia & Partners

Expected Impact for Nokia & Partners

- Shared vision for development of life science manufacturing ecosystem
- Common data language across pharma, med-tech, electronics
  - Scattered data and data generation issues are solved! (or close)
- Cases for automated agentic AI in manufacturing
- Faster AI validation ⇒ shorter innovation cycles
- Understanding of users' expectations toward new technology implementation
- Attracting new investments and talent in data-driven manufacturing.

What We Would be Looking for at Veturi?

What We Would be Looking for at Veturi

- Pilot cases for:
  - validation-aware AI and digital twins in manufacturing & IoT
  - supply chain innovations and sustainability, when implementing new technologies
- Access to data to test AI/ML and co-develop SW Engineering practices
- Joint work on intersecting challenges.

LET'S BUILD TOGETHER!

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manufacturing in Finland
LifeFactFuture
The Networked Life Sciences Factory of the Future:
Data-driven for the Short and Long Term
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DAREKON
ORION
Bittium
NOKIA
revvity
UNIVERSITY OF HELSINKI
UNIVERSITY OF TURKU

Thank You!

BUSINESS FINLAND