

Evaluating the value and costs of technology

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Kestävää kasvua ja työtä -ohjelma



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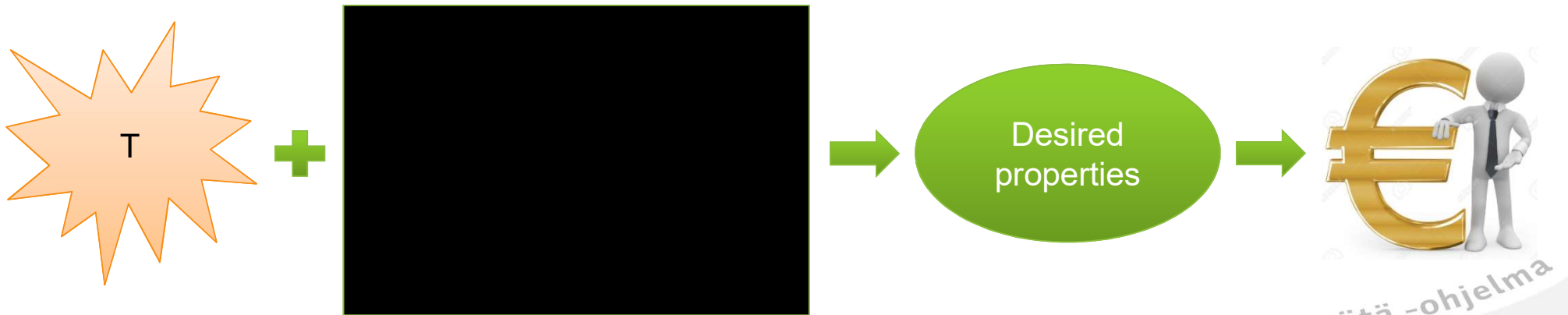
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Technology valuation

- Technology: "The specific way of delivering an effect to an operand."*
*Hubka, V., & Eder, W. E. (1988). Theory of technical systems: a total concept theory for engineering design. Berlin: Springer-Verlag.
- Estimation of monetary value based on the change of desired technical properties where the technology has an effect

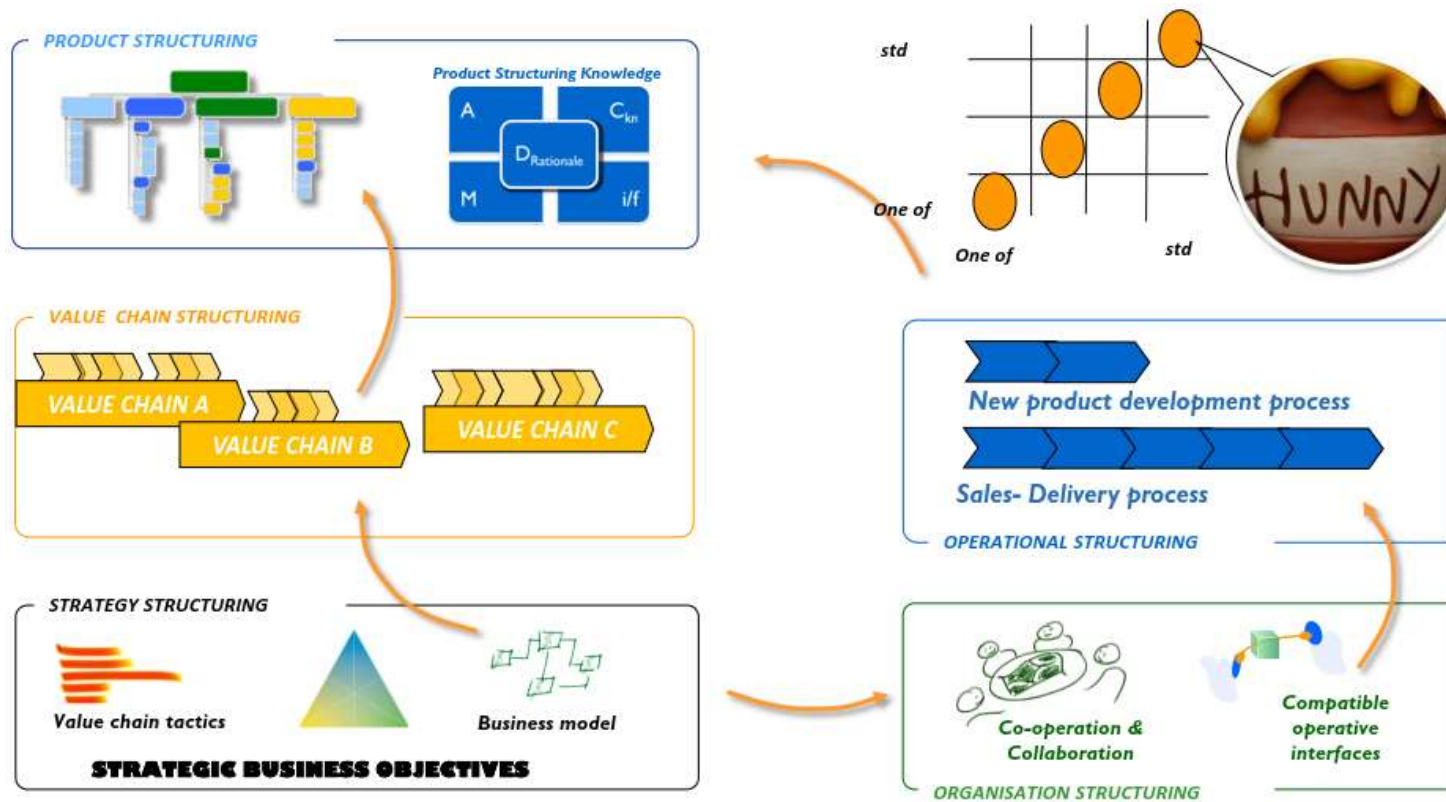


Information needed

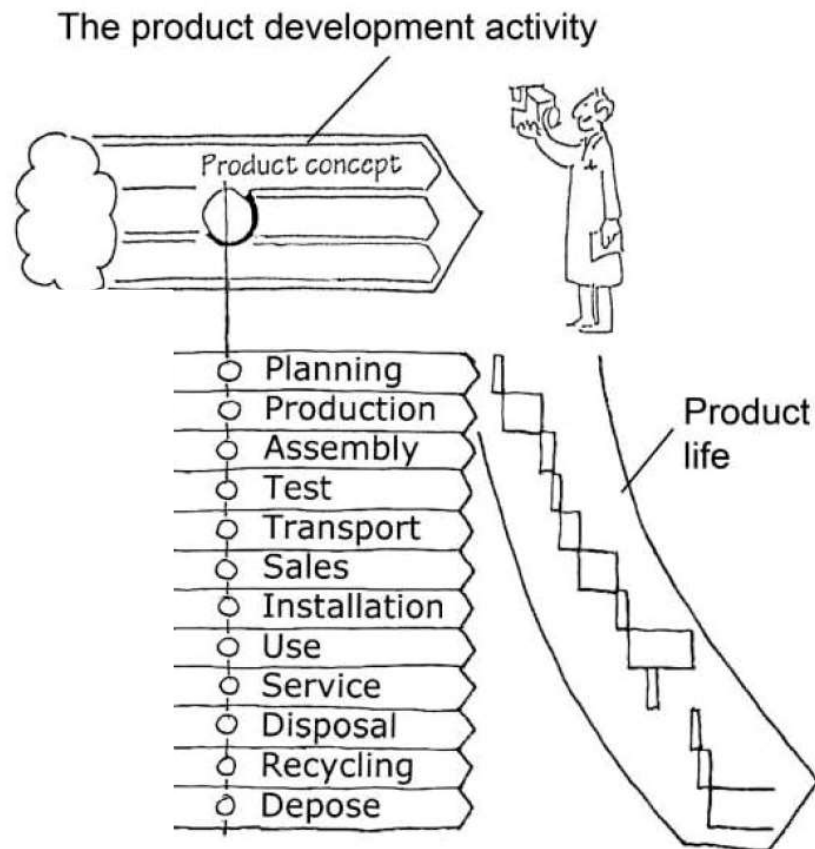
- What information is needed to evaluate the value and costs of technology based on design science?
 1. Technical system intention and business intention
 2. Product life cycle phases
 3. Desired properties from life cycle phases
 4. Product structure
 5. Technology characteristics
 6. Dispositions between actual and desired properties
 7. Potential effect of technology related to the product
 8. Financial estimation



1. Technical system intention and business intention



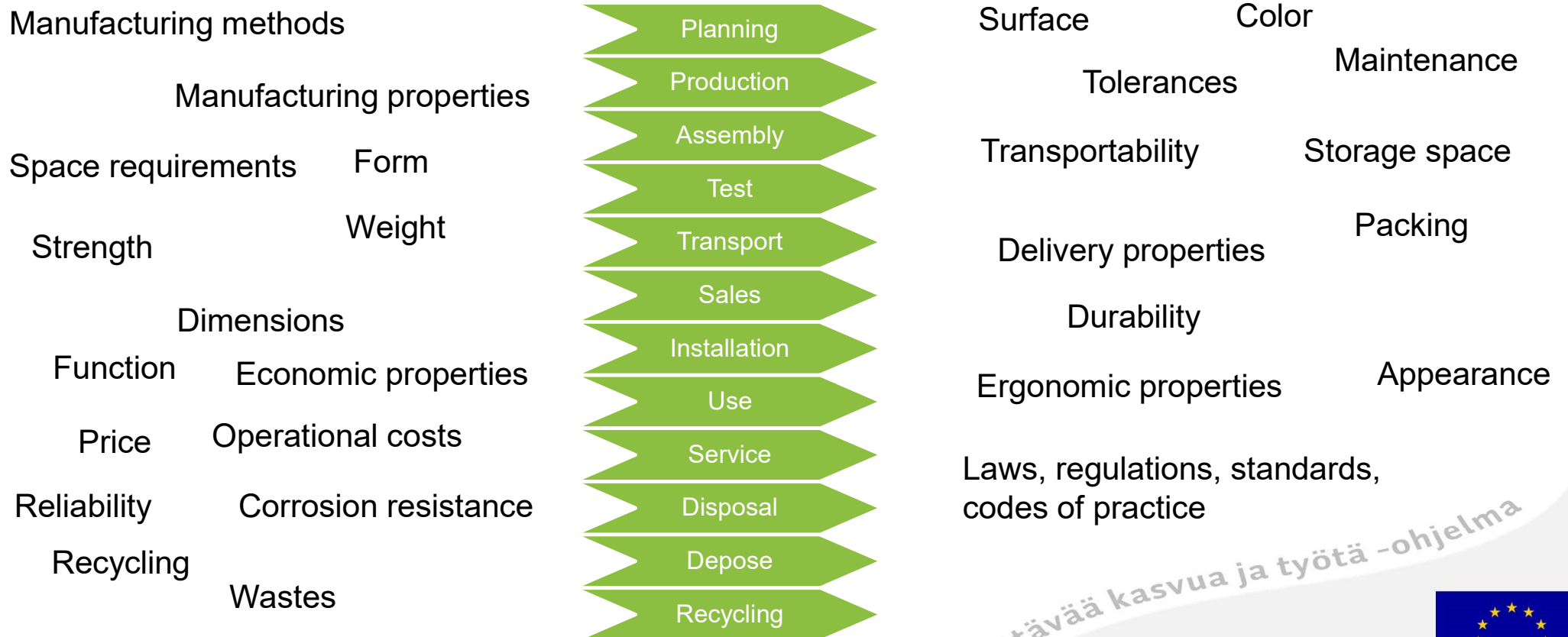
2. Product life cycle phases



- The life cycle of a product has to be considered in the situation where the product has possible influences on all the systems and phases that it goes through (Olesen 1992)

Figure: Andreasen (2011)

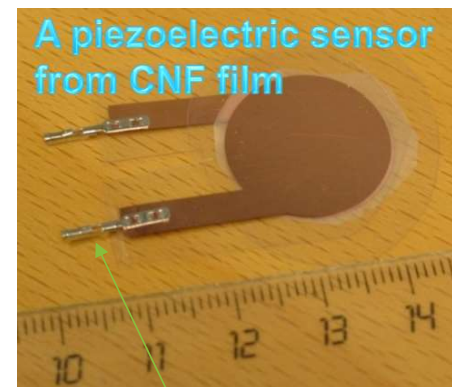
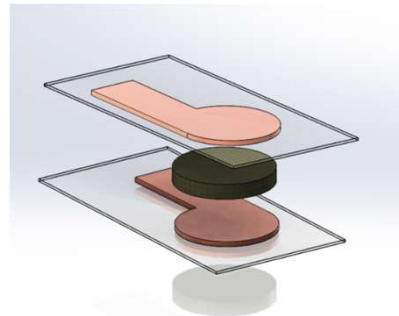
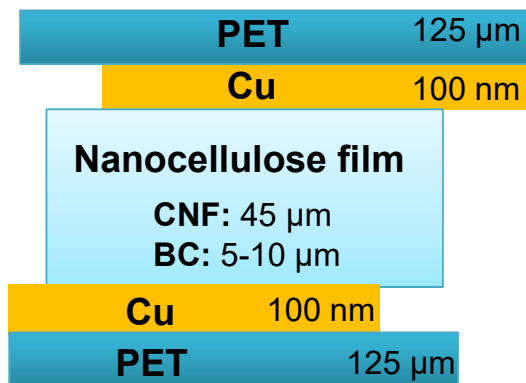
3. Desired properties from life cycle phases



4. Product structure

One example:

Sensor structure side-view and 3D illustration



Crimp connector

[S. Rajala *et al*, ACS Applied Materials and Interfaces (2016)]

5. Technology characteristics

- Cellulose nanomaterials

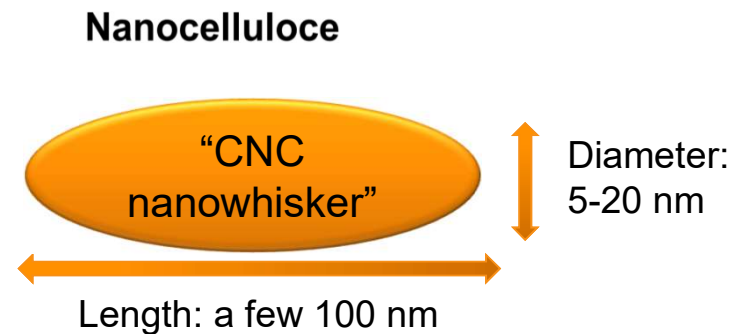
- Length
 - ...nm
- Diameter
 - ...nm
- Piezoelectricity
 -

- Films and coatings

- ...

- Sensors

- Sensor sensitivity
- ...



6. Dispositions between actual and desired properties

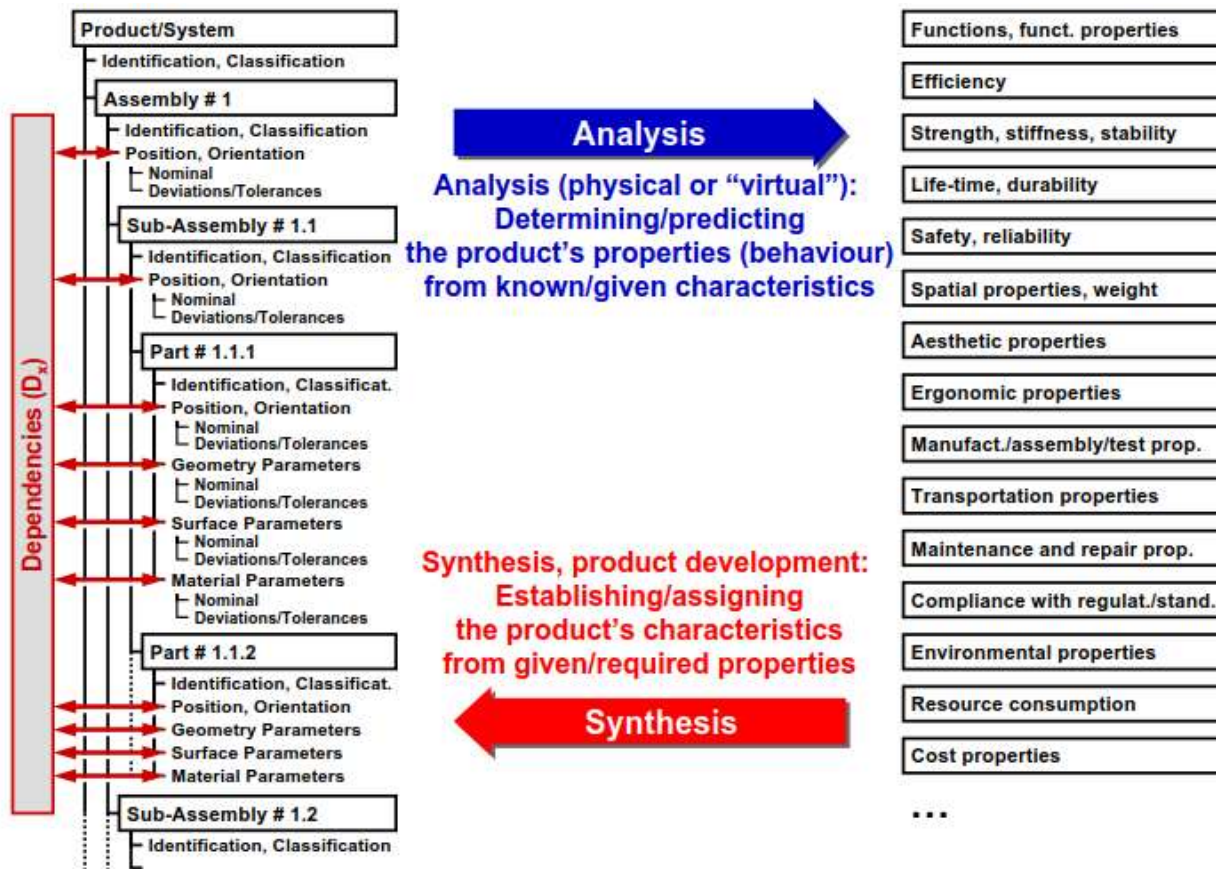


Figure: Weber (2010)

7. Potential effect of technology related to the product

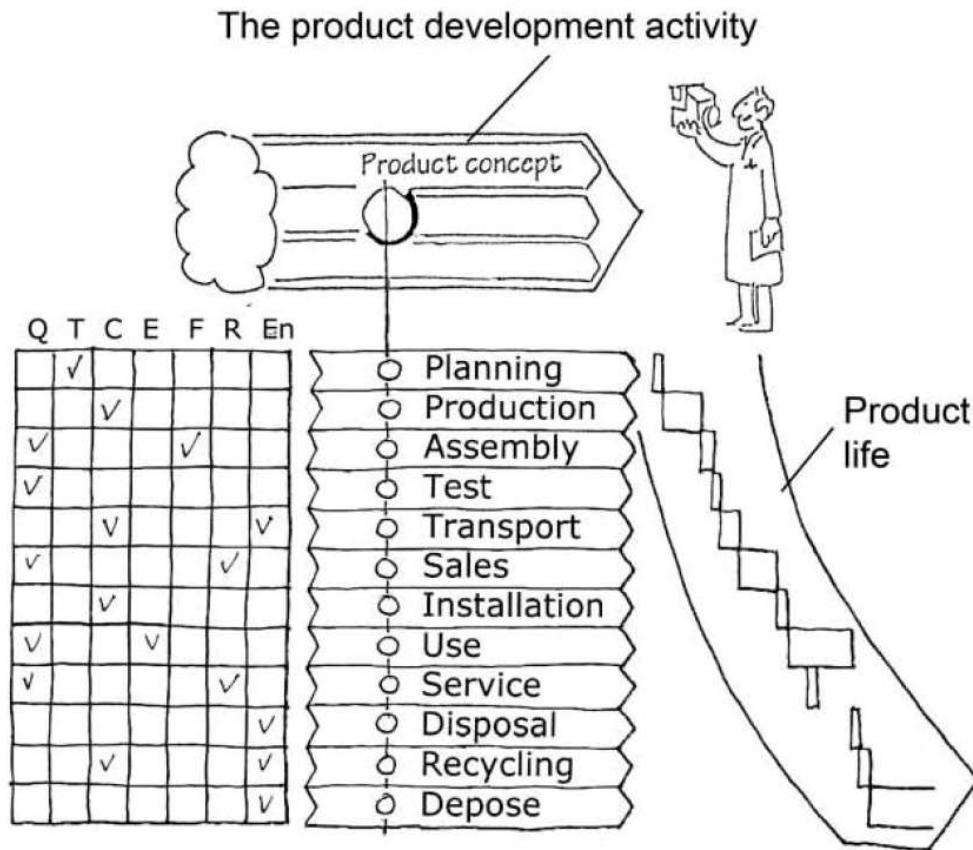
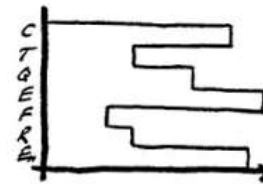


Figure: Andreasen (2011)

- cost
- throughput time
- quality
- efficiency
- flexibility
- risk
- environment

Estimated results:



Actual results:

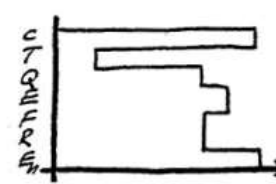


Figure: Olesen (1992)

8. Financial estimation

- Evaluating the value and costs of technology is based on questions related to the most important mechanisms of technology pilots in relation to its potential life cycle.
- Impacts can be related to cost, quality, time, resources, customer experience and income.
- The result of evaluation describes the potential of a technology pilot in a defined scenario.



Thank you! Kiitos!

Project's Principal investigators:

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Project staff:

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