



Additive manufacturing Roadmap for Ostrobothnia Region 2019-2025

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Additive manufacturing development in Ostrobothnia 2019-2025. The main objectives

Awareness

- To increase visibility and awareness (conferences, events, networking, fab labs visits)
 - Aiming both students and companies

Education

Student courses,
companies workshops

- Design
- Topological Optimization
- Simulation
- 3D scanning
- 3D printing

Implementation

- Center of Excellence
 - Metal 3D printer
 - Part studies
 - Projects with companies and universities
- Implementation of AM technology in companies

Road map for companies for AM Implementation

1. Establishing the Initiatives and Strategic Direction

- ▶ Establishing the clear plan how AM will affect the industry and what are the future implications
- ▶ Department leaders starting to invest in technology
- ▶ Application of AM in the overall company strategy

2. Organization and Processes

- ▶ Investment in developing skills and knowledge about AM
- ▶ Establishing new jobs and roles
- ▶ Champion departments integrating AM
- ▶ Creating cross-functional teams
- ▶ Rearranging organizational structure
- ▶ Establishing new business units

Road map for companies for Implementation of AM

3. Technology Investment

- ▶ Analyzing which software and hardware will be needed
- ▶ Testing different technologies (redesigning parts and producing them with service providers)
- ▶ Choosing the AM printing system

4. Implementation and Performance

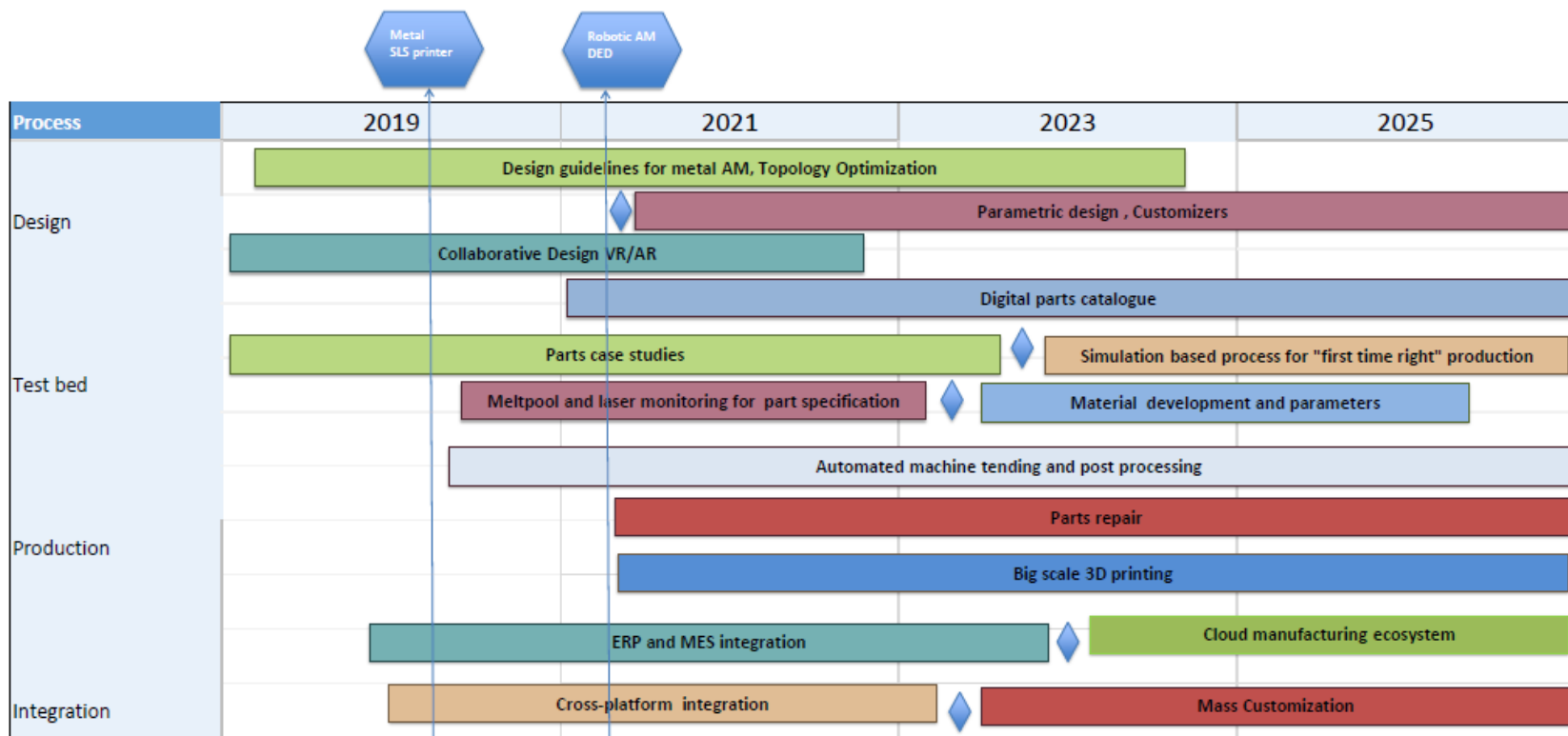
- ▶ How AM can compliment the existing technologies
- ▶ How the new parts will be implemented and certified
- ▶ How long it will take product to market
- ▶ How applying AM will improve efficiency and performance

Road map for companies for Implementation of AM

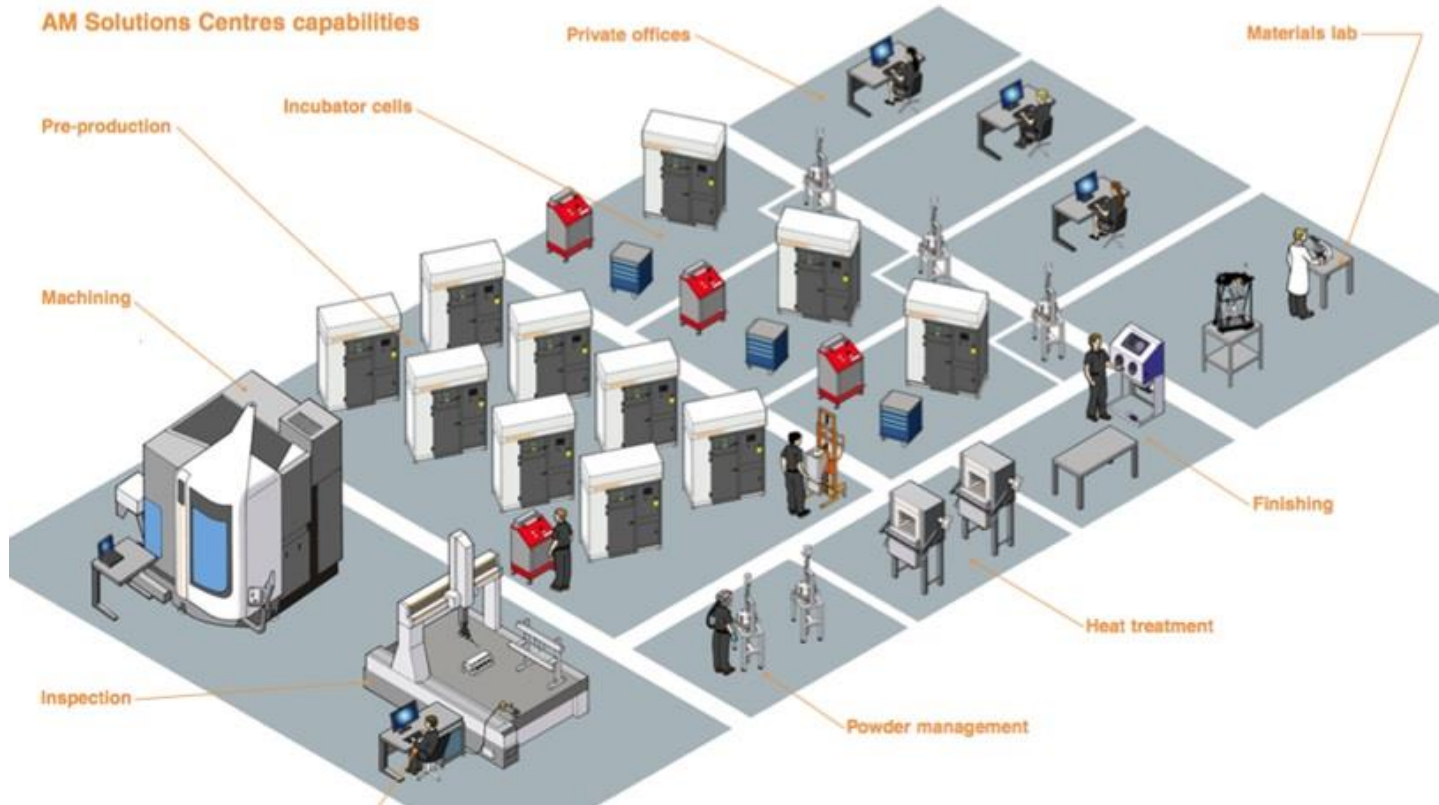
5. Creating a Network

- ▶ Who are key stakeholders in the 3D printing industry
- ▶ Establishing the key partnerships
- ▶ Cooperating with universities and research institutions
- ▶ As AM printing technologies are relatively new, cooperation is the key!

AM Technology roadmap for Ostrobothnia

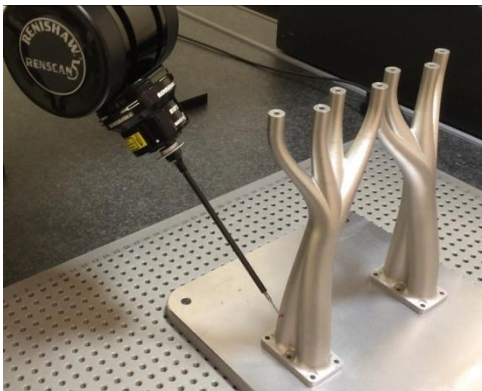
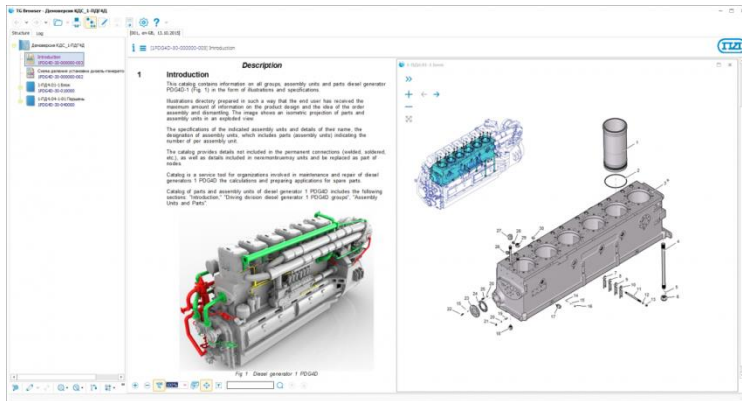


AM CoE in Technobothnia: Integrated end to end system for industrializing Additive



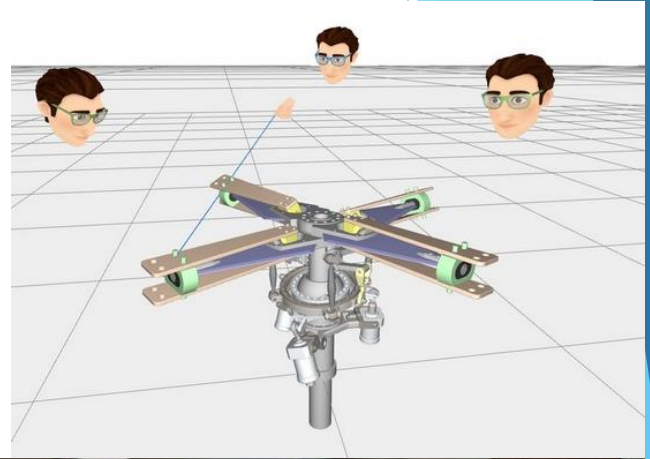
Digital Parts Catalogue

3D scanning, dimension measurement and quality control

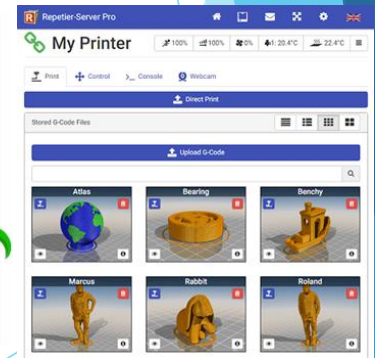
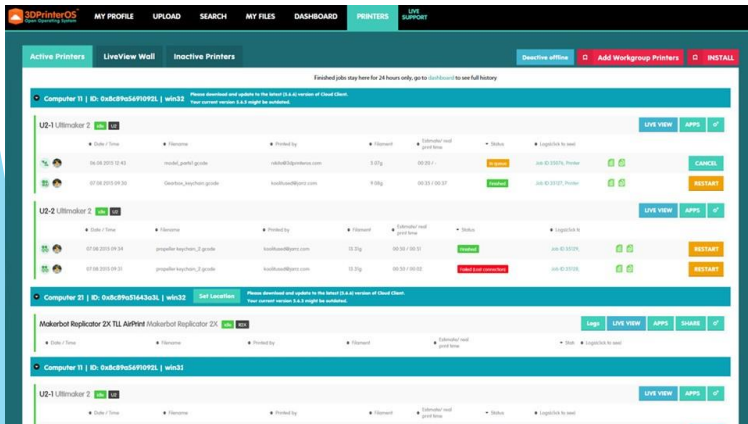
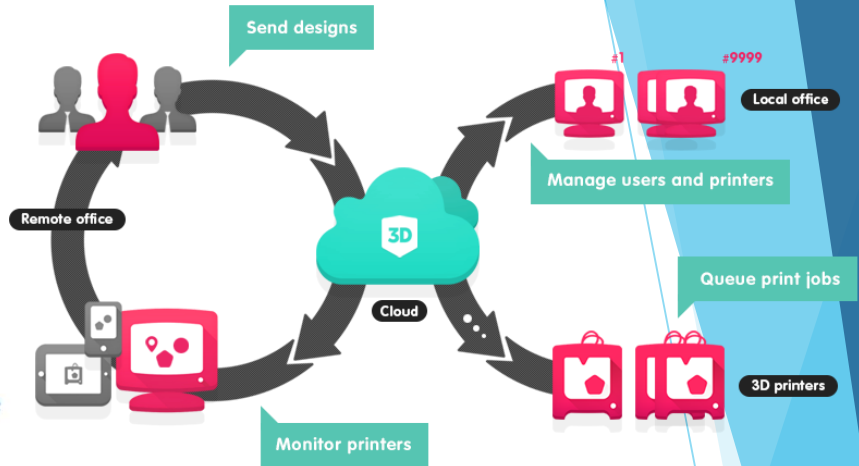


Virtual Reality Future of Collaborative Design

- ▶ Designing for Metal AM needs collaboration between many stakeholders, R&D, Maintenance, Assembly etc. hence new VR/AR tools
- ▶ NVIDIA Holodeck
- ▶ IMPROOV - VR Teleconferencing Software for CAD teams



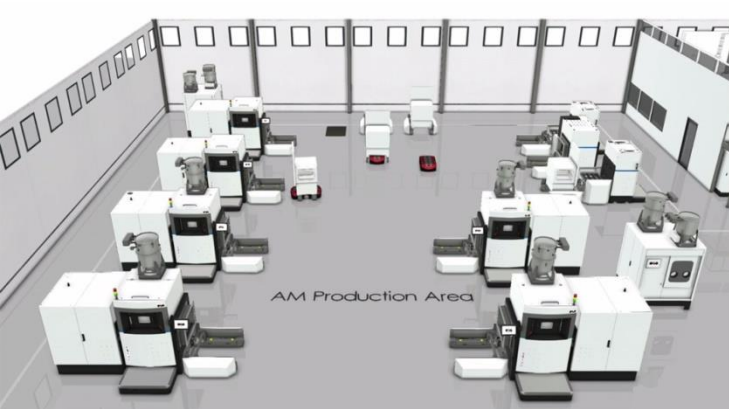
Wireless control and Cloud Manufacturing



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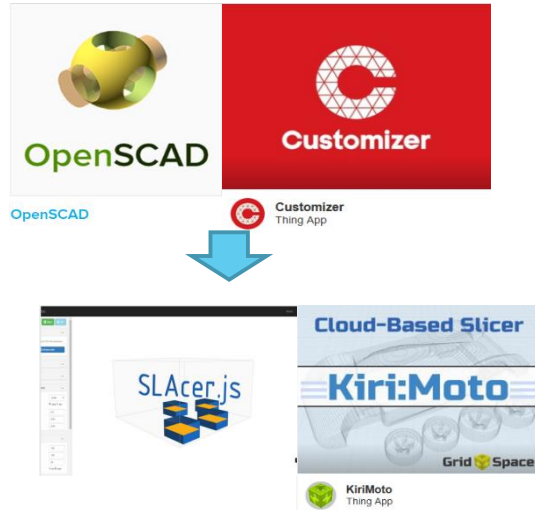
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Production simulation
Digital twins,
ERP/MES integration
SAP and UPS



Online CAD, G-codes, CAM, Nesting Simulation and online pricing

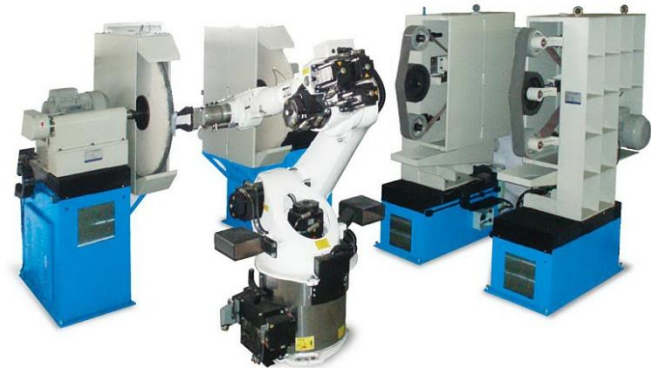
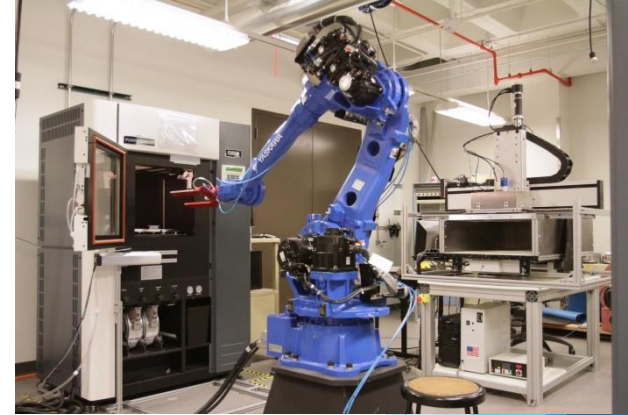


Cloud based slicers,
Preparing CAM/G-
code

Feeds Info for the
instant quotation

Integrated with
Onshape, Imaterialize
etc.

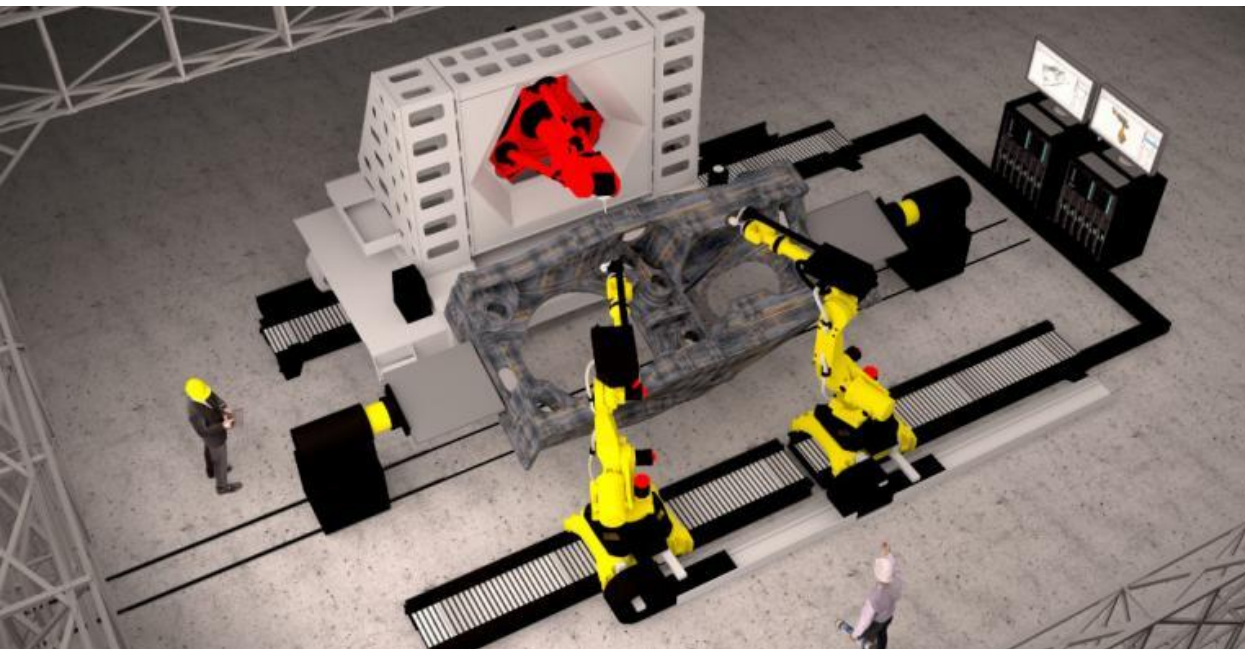
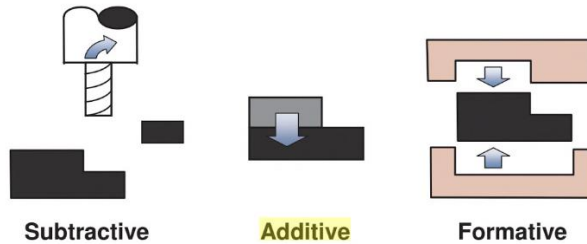
Automated machine tending, machine cleaning and post-processing for high volumes



Direct energy deposition (DED) Cold Metal Transfer (CMT) for parts repair



Hybrid manufacturing



Thank You for Attention!