

CHALMERS
UNIVERSITY OF TECHNOLOGY

Future of Space Manufacturing

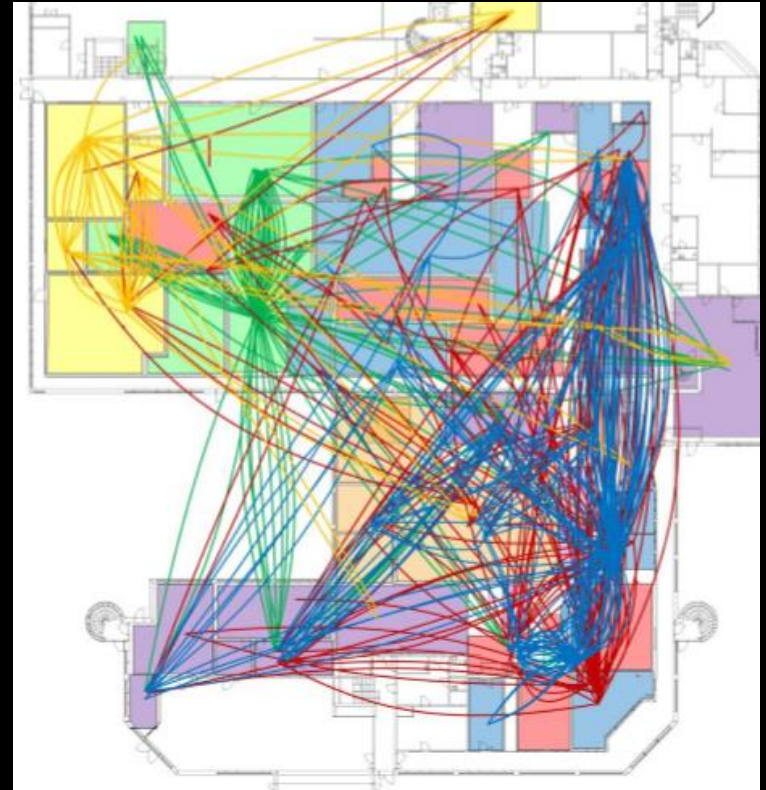
Daniel Nåfors
181116 Stockholm



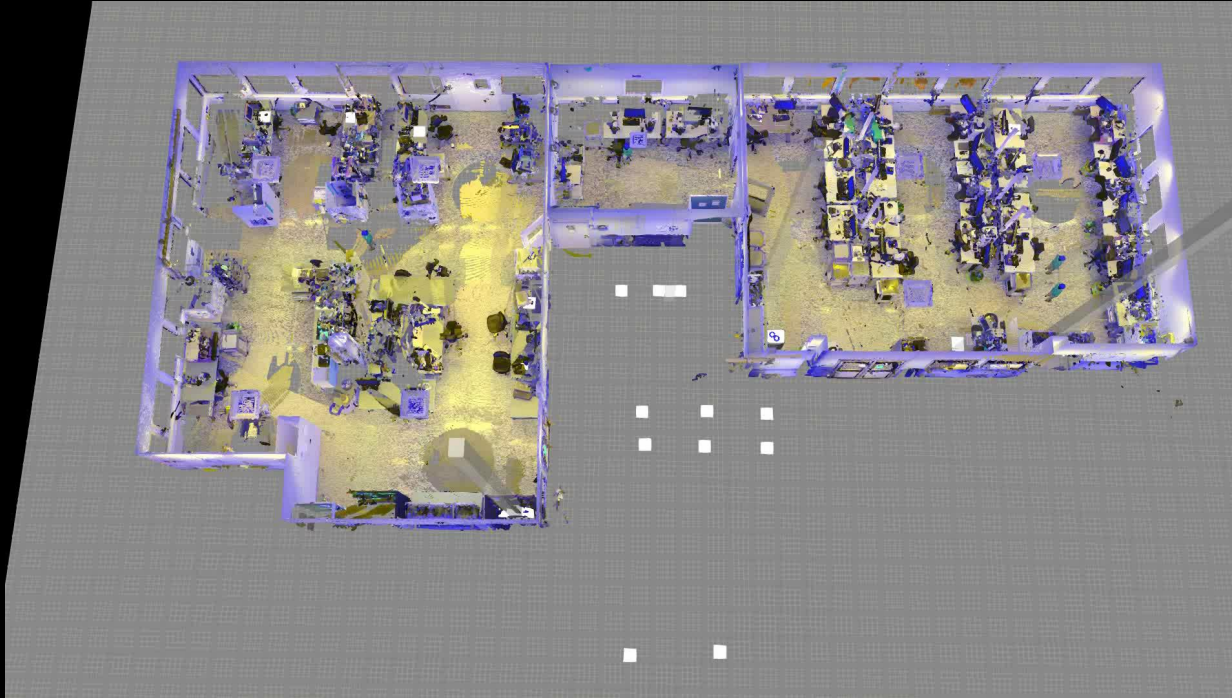
Together
ahead. **RUAG**

Starting point of the project

- New space
- Adapt the production system
- Understanding the production system



Simulation model (part of)

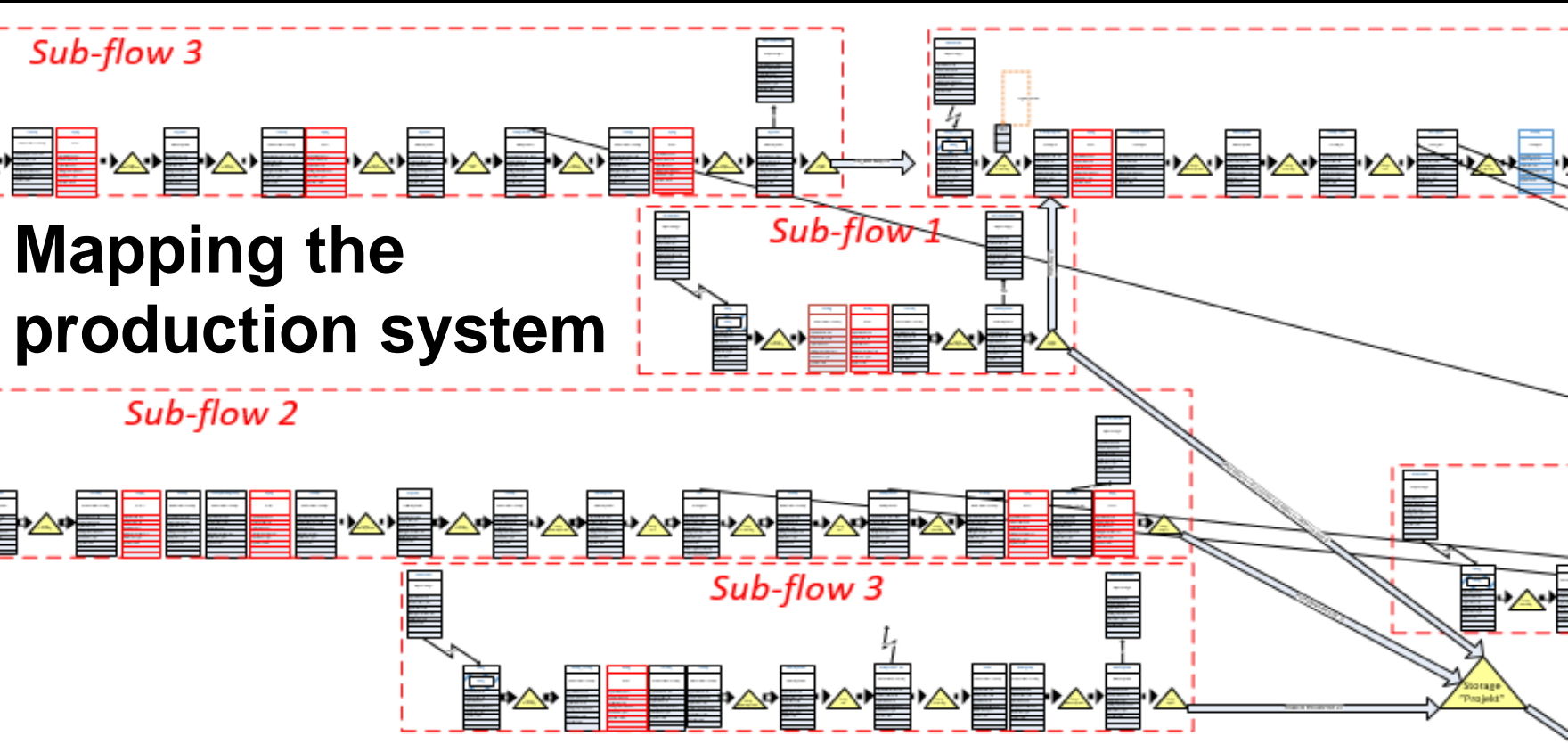


Current state

- **Gather an understanding**
- **14 interviews with different roles throughout RUAG**
 - **Senior managers**
 - **Finance**
 - **HR**
 - **Engineers**
 - **Key account manager**

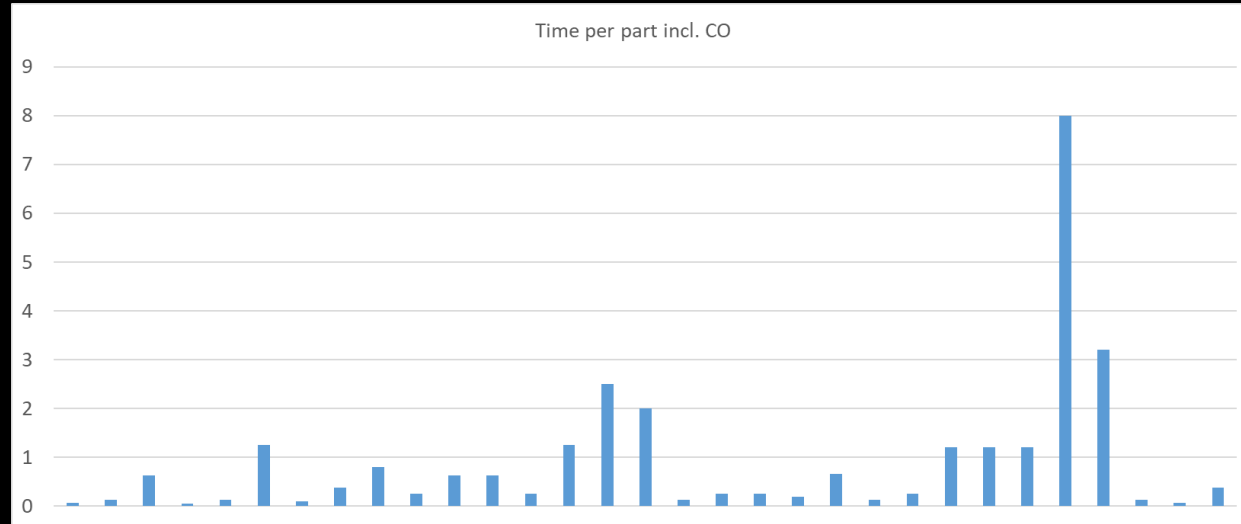
Digitalization of factory





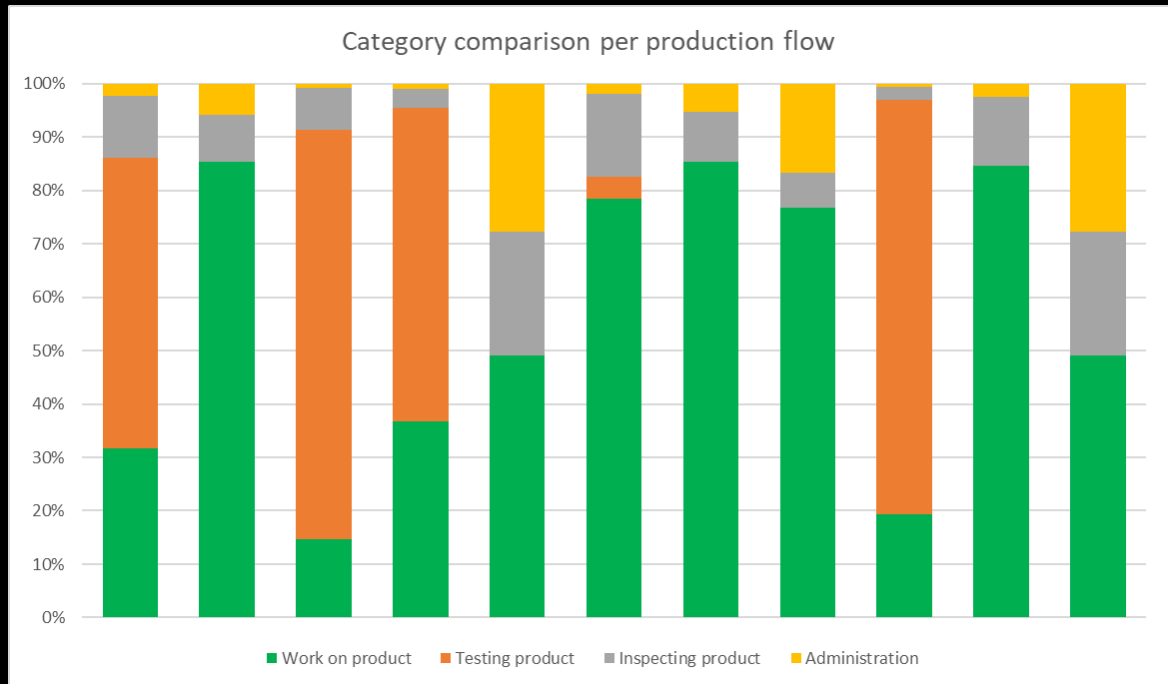
Production system analysis

Time per process in one sub-flow



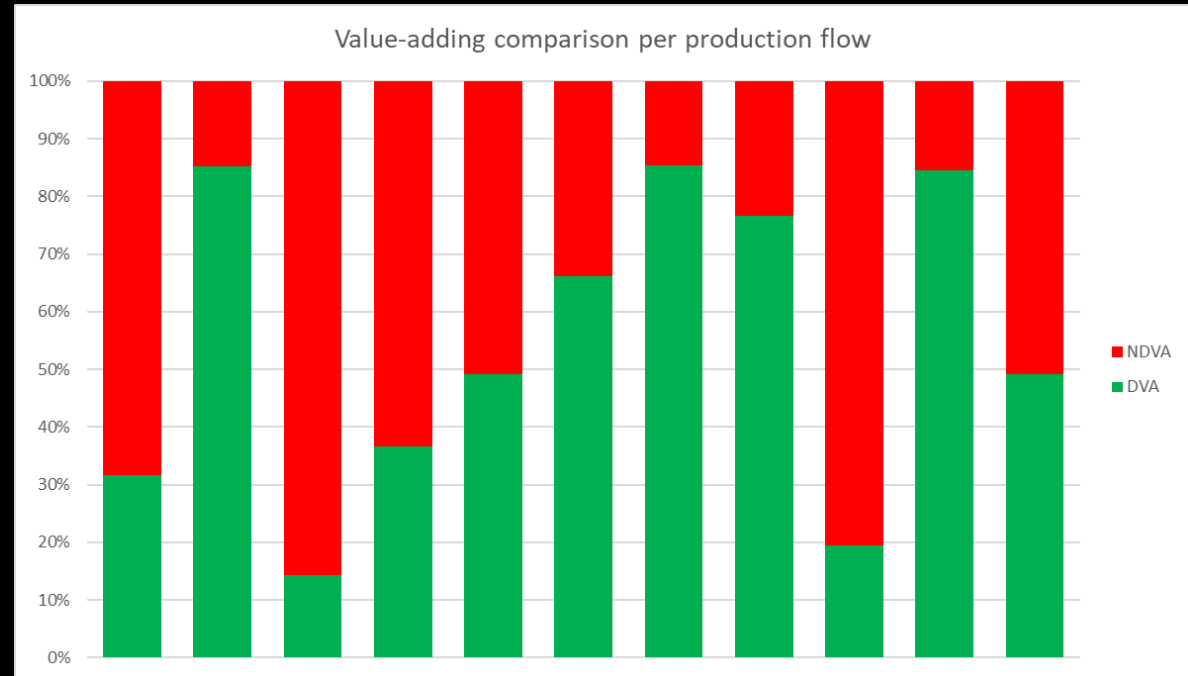
Production system analysis

**Percent of time spent
on different
categories**



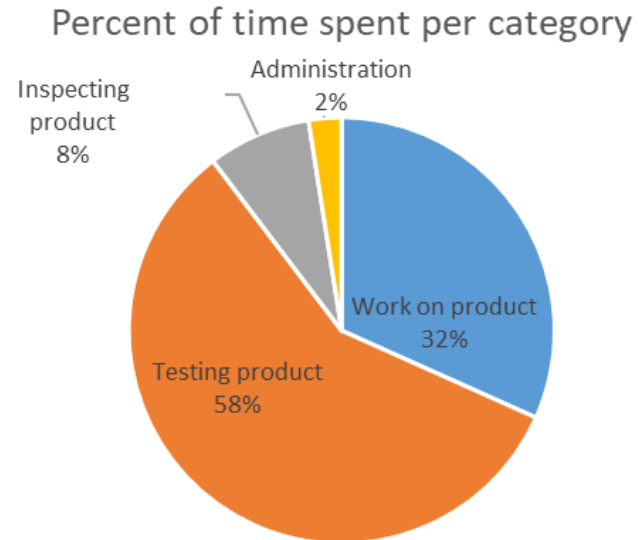
Production system analysis

**Percent of time spent
on directly adding
value**



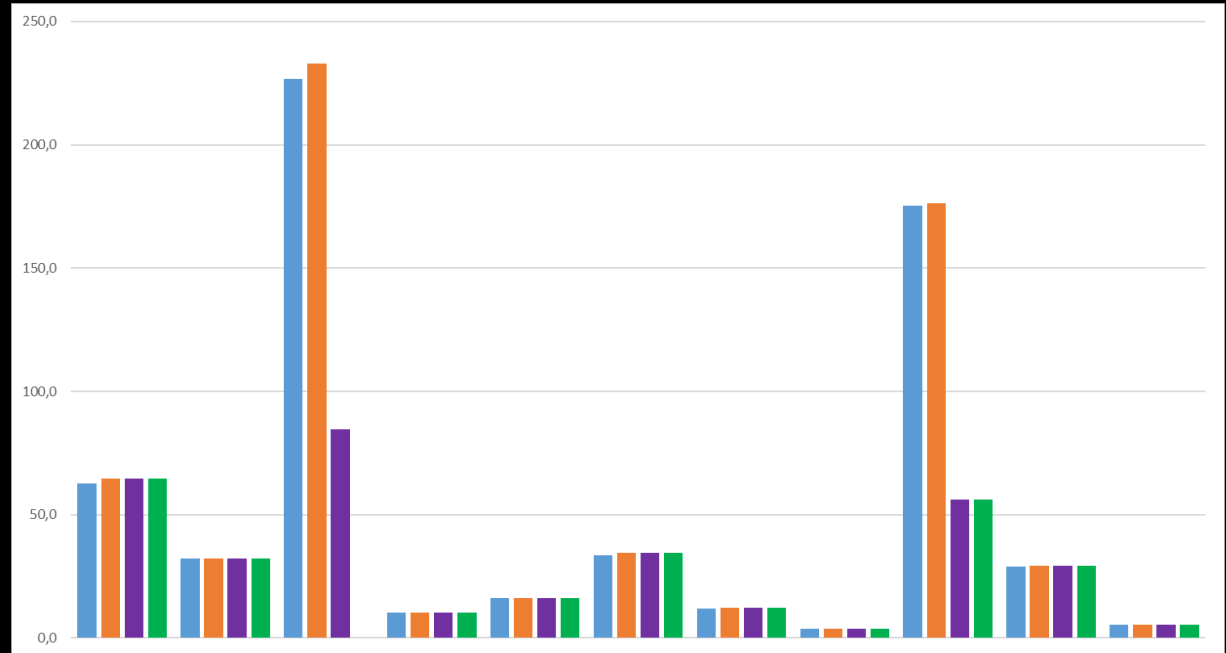
Production system analysis

Summary of time spent in all production flows



Production system analysis

**Time required per
sub-flow for a
complete product**

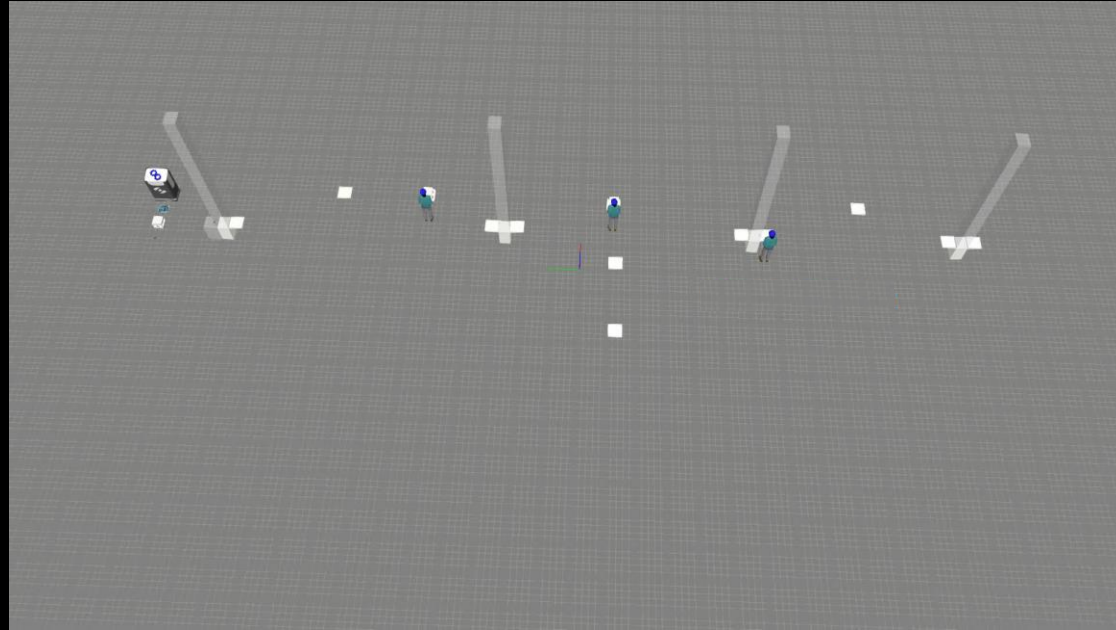
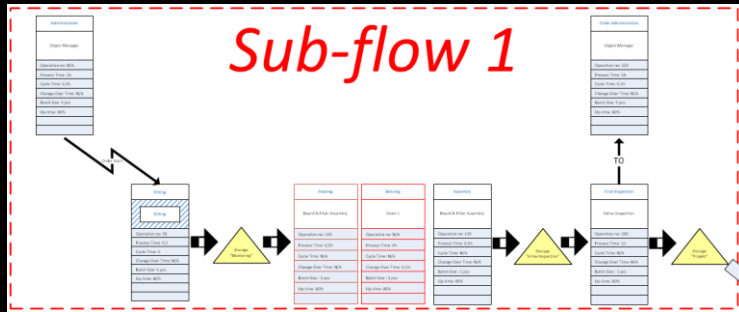


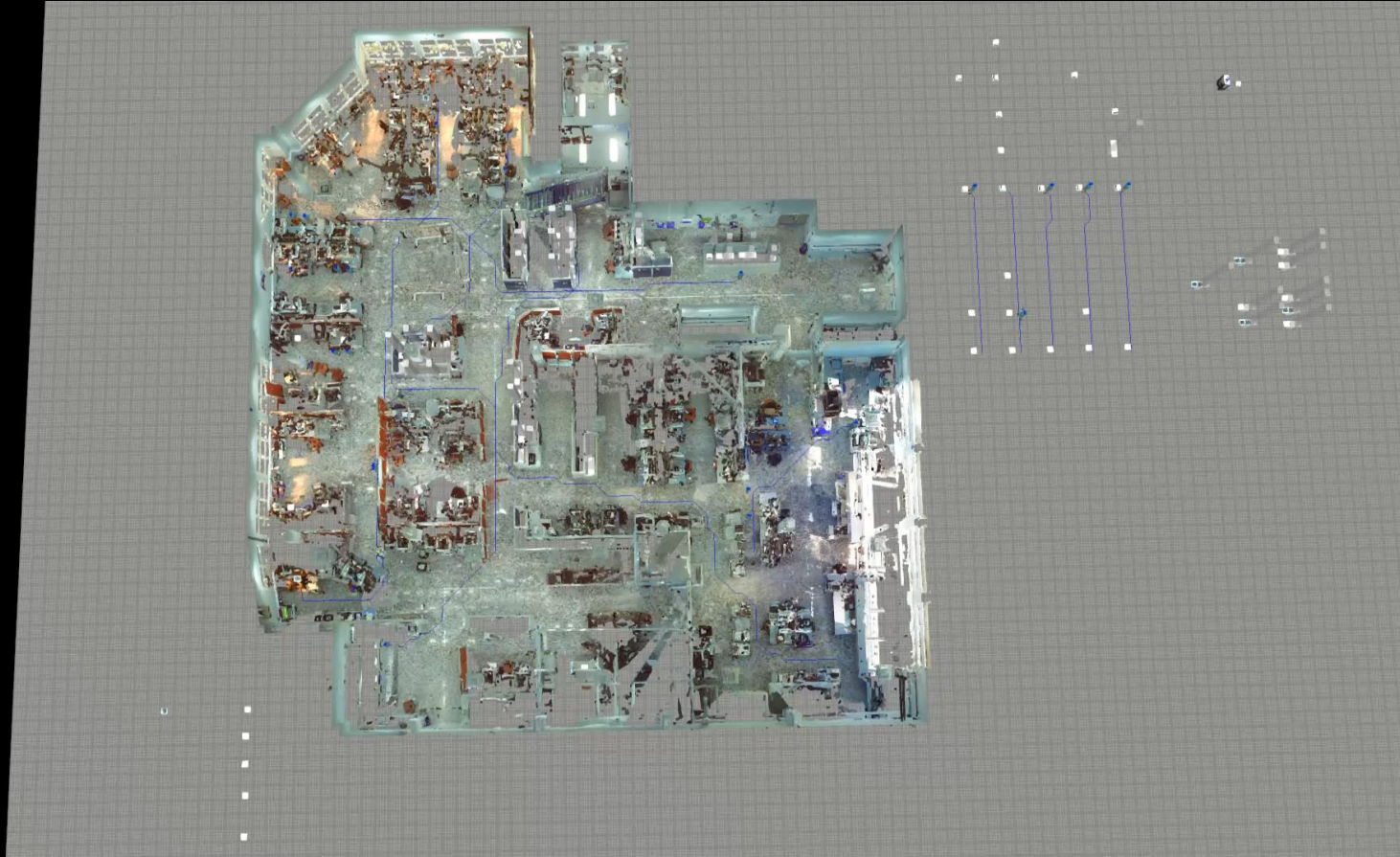
Simulation models

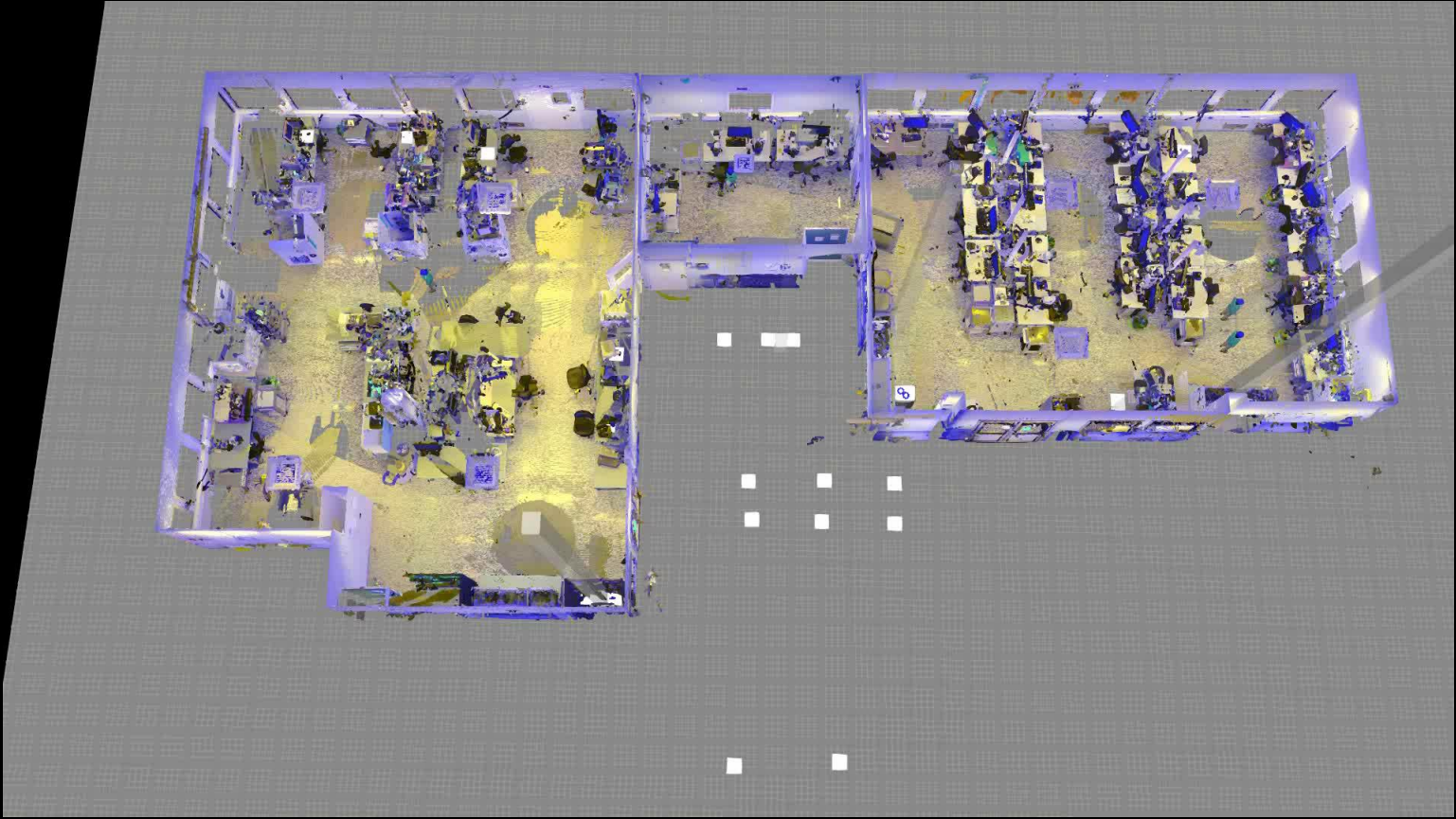
- **Two simulation models of the production system**
 - **Visual components**
 - **Automod**

Simulation models

Individual sub-flow







New space

- **Interviews**
- **Demands and requests on the future system**
- **More work needed**

Publications and documentation

Scientific publications

- **Four conference proceedings spread over CIRP Conference on Manufacturing Systems and Winter Simulation Conference**
- **Poster competition at AAAS**

Student projects

- **Two master theses (2017 and 2018)**
- **Report from student project in a 7,5 credit project course (2018)**
- **Reports by two intern students from a French University (2017 and 2018)**

Thank you for listening

Daniel Nåfors
Daniel.nafors@chalmers.se

Maja Barring
Maja.barring@chalmers.se