



Software Center

The Lack of Sharing of Customer Data in Large Software Organizations: Challenges and Implications

Aleksander Fabijan, Helena H. Olsson and Jan Bosch

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Software Center

Mission: Improve the software engineering capability of the Nordic Software-Intensive industry with an order of magnitude

Theme: Fast, continuous deployment of customer value

Success: Academic excellence

Success: Industrial impact



CHALMERS



MALMÖ UNIVERSITY



MÄLARDALEN UNIVERSITY
SWEDEN



Tetra Pak



SIEMENS



verisure

ALARMS WITH IQ

AXIS[®]
COMMUNICATIONS



JEPPESEN[®]
A BOEING COMPANY

ERICSSON



GRUNDFOS



Pre-development

Sales demos
Change requests
Face-to-face meetings
Observations
Interviews
Design studio
Mock-ups
Prototypes
Usability tests
User Forums
Demo sessions
Service and support data
Personas (tasks)
Customer journeys (relations, roles)
Observations
Clinics (UI)
Videotaping
Eye movement tracking
User groups
Monitoring
User experience testing
Site visits

Development

User Acceptance Testing
Discussion workshops
Implementation projects
Iteration Demos
Atrium/ AS
Launching customer
Benchmarks
Customer test cases
Optimization development
User groups
User forums
Usability tests
Site visits

Post-development

Logs
Quality statistics
Sales demos
Benchmarks
Discussions workshops
Observations
Site visits
Service and support data
Benchmarks
Customer observations
Webinars
Customer surveys
Change requests
Deployment changes
Bugs
Incident Reports
Operational issues



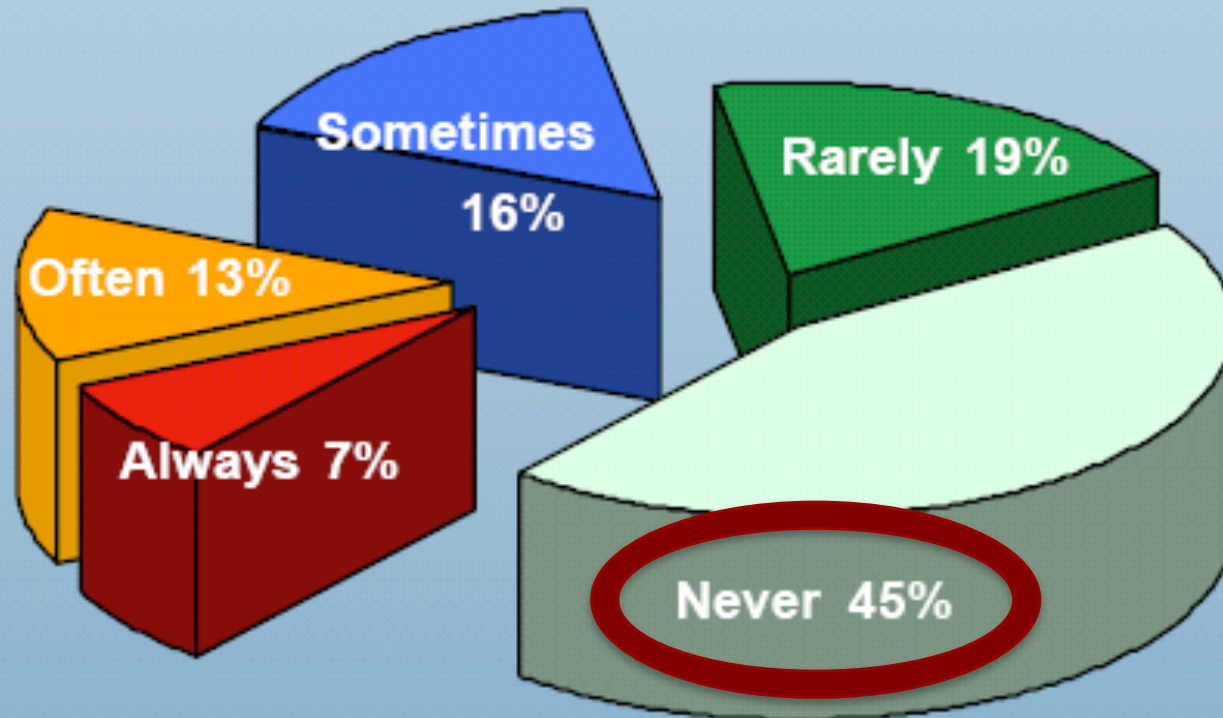
Continuous collection of customer data.

“Featuritis”

Features / Functions Used in a Typical System

**Often / Always
Used: 20%**

**Rarely / Never
Used: 64%**



Standish Group Study Reported at XP2002 by Jim Johnson, Chairman

We collect the data – BUT...

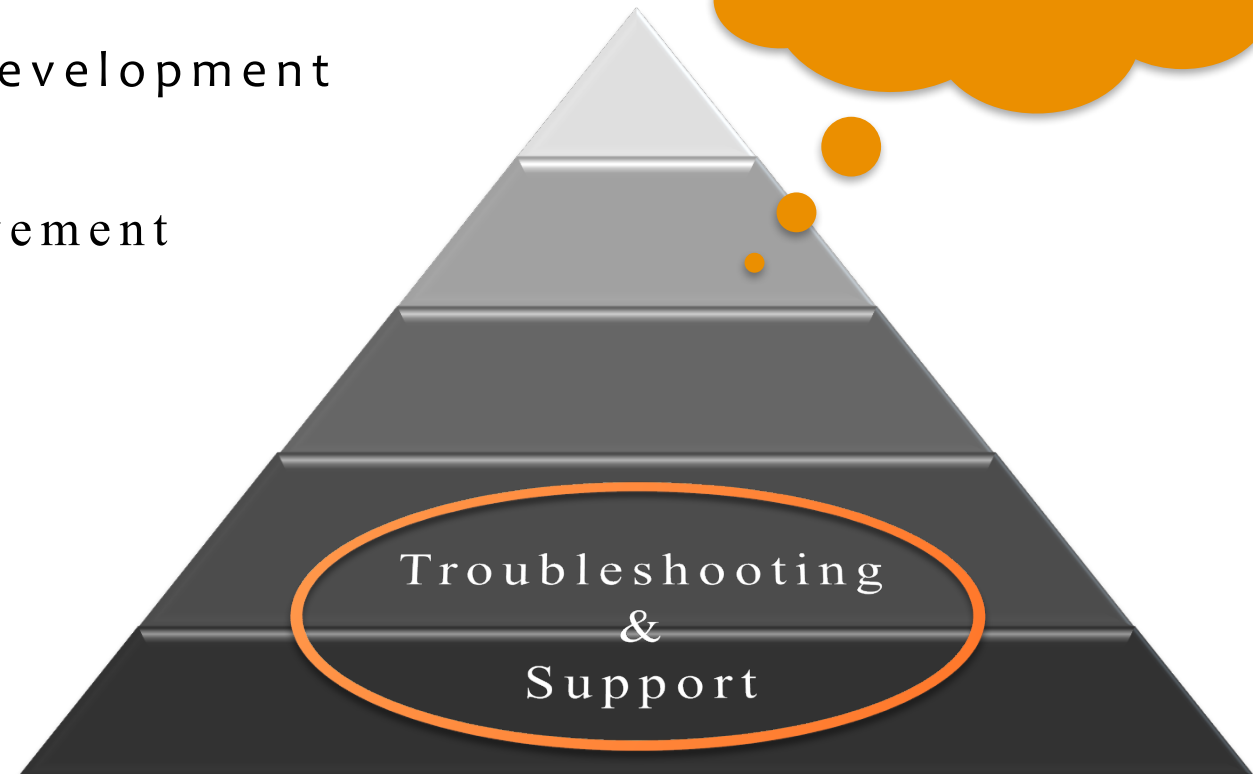
New feature development

Feature improvement

Feature usage

Diagnostics

Operation



Limited use of the data we collect.

Background



- Companies collect **huge** amounts of data.
 - Customer feedback
 - Operational data from products in the field
- Data is **not** used to:
 - Inform PdM decisions, KPI:s or R&D allocation
 - Continuously validate customer value
- **WHY...???**
 - Data is not successfully **shared** among people, between development phases and across organizational units.

“The data we collect gets lost. It is like a *whispering* game.”



Results

Based on *multi case study* research
in the SW Center companies



Challenge #1

Fragmented collection and storage of data.

“... it is all in *my* head...”(Product owner).

“Information exists but we *don't know* where it is...” (UX specialist).

“I don't know everyone... So I contact *only* the person who is next in line...” (Sales manager).

Challenge #2

Filtering of customer data.

“We collect lots of data, but share it *only* with people in the development phase we work in.” (*Developer*).

“Attempts to communicate and share customer data *across* development phases are typically unsuccessful.” (*Developer*).

“It is like there is a wall in between. There is a tradition that we should *not talk* to each other.” (*Product Owner*).

Challenge #3

Arduous to measure means hard to share.

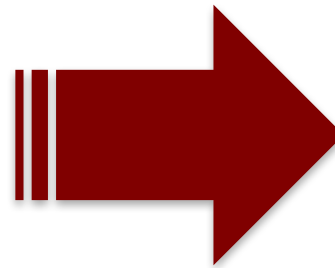
“We typically share things we can *measure*... like transaction records, incident figures, feature usage data and other technical feedback.” (*Data analyst*).

“User stories, feature purpose, or the intention of a certain requirement typically *stay* with the people that collected that feedback.” (*UX specialist*).

“Maybe 10% of information is shared. It is very *difficult* and it takes time...” (*Product manager*).

Finding #1

- Companies benefit from a very *limited* part of the data they collect due to lack of sharing of data and poor traceability in large data sets.



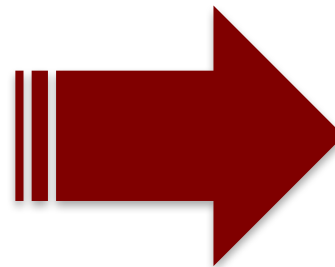
This results in...

- People struggle with getting access to the data they need. As a result, they **repeat work** that has already been done by others but that they cannot get hold of or see the result of.



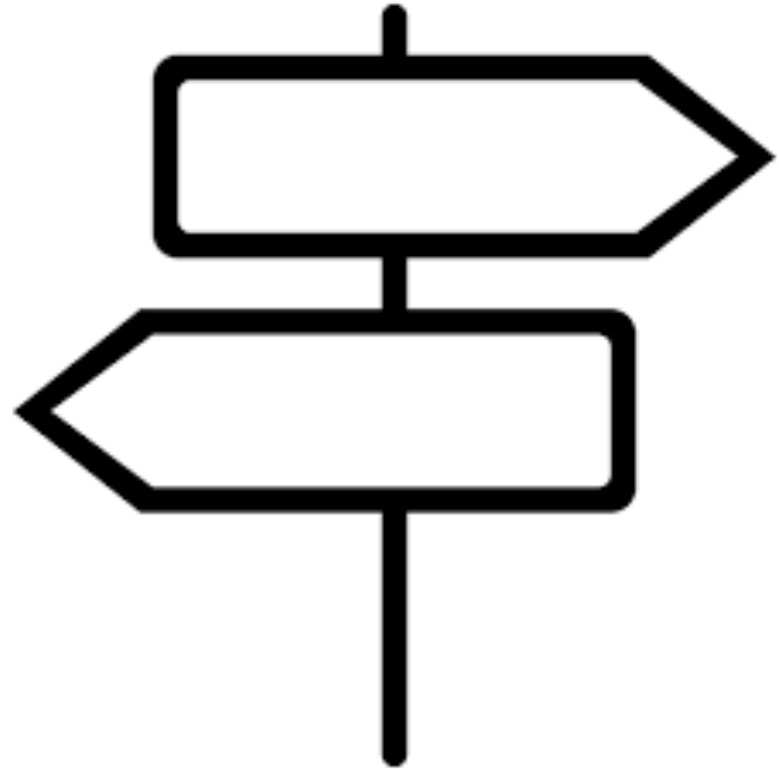
Finding #2

- To share data across organizational entities, between development phases and among roles is difficult. As a result, R&D organizations risk ***local optimization*** and a situation in which knowledge and insights generated from the data is not accumulating.



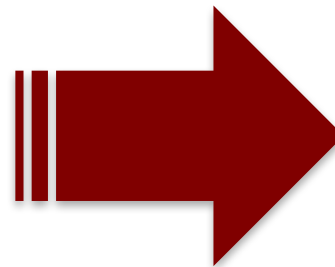
This results in...

- Although decision-making at the team level might be data-driven, higher level decision-making, including e.g. larger re-designs, new product development and innovation, falls back on *opinions*.



Finding #3

- The tension between what we can easily measure and quantify, and what we cannot, results in *inaccurate* assumptions on what is customer value.



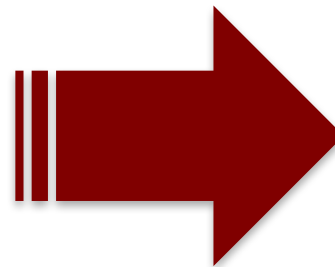
This results in...

- Internal models and ***assumptions*** on what constitutes customer value, rather than an understanding that is externally validated with customers.



Finding #4

- Technical data on e.g. system performance and operation is effectively shared, while ***contextual data*** on e.g. user environments, user tasks and user experience, is not.



This results in...

- Validation of customer value becomes a ***'self-fulfilling prophecy'*** in focusing on things that can be quantified and provide tangible evidence.



Roles

Pre-Development

1. Strategy specialists,
2. Product owners,
3. product managers,...

A

CE Techniques

- Trend Analysis
- Interviews
- Other

Qualitative data perishes in the hand-over between PO:s/PM:s UX specialists/software developers.

Qualitat

Product / User Satisfaction

D

Development repeats data collection or develops the Product based on insufficient information.

Development

1. UX specialists,
2. Software engineers
3. System
- 4.

UX and developer feedback on prototypes etc. is only used within the development phase.

Prototype acceptance

Bottlenecks/constraints

Interaction design sketches

Eye behavior and focus time

E

Service, sales and operators of the product don't understand the reason behind a configuration when solving a problem.

Post-Deployment

1. Release manag
2. Serv
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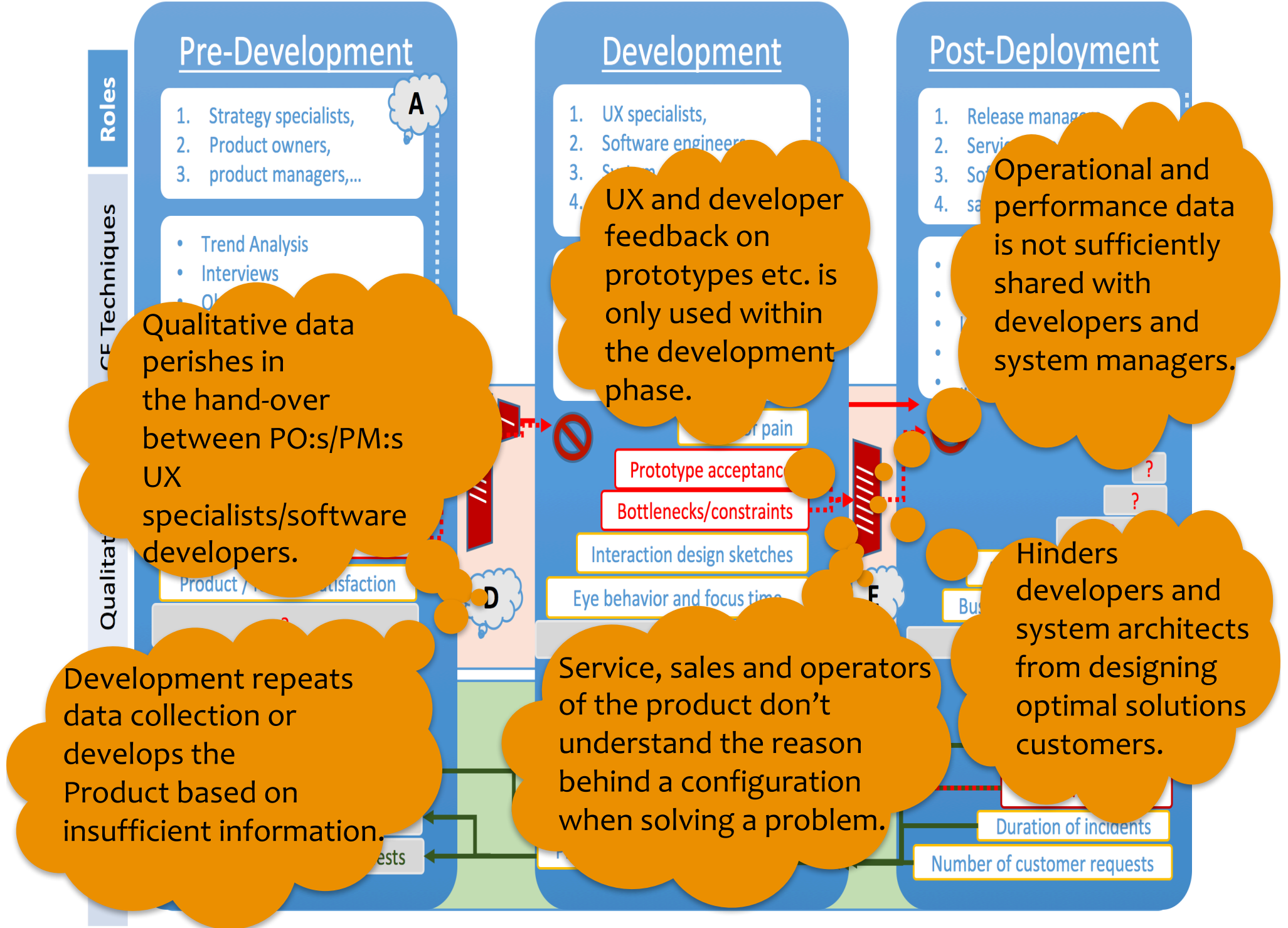
Operational and performance data is not sufficiently shared with developers and system managers.

Hinders developers and system architects from designing optimal solutions customers.

Duration of incidents

Number of customer requests

ests



Conclusions

- **Data sharing happens primarily within, but not across, development phases and organizational units.**
 - *Pre – During – Post development*
 - *UX – Developers – PO:s/PM:s – Sales/Service/Operators*
- **Unidirectional flow of data.**
 - *Data from early phases of the development to later phases is limited.*
 - *Only what can be quantified and measured is shared.*
 - *Non-evolving and non-accumulating knowledge.*
- **Shadow representation of customer value**
 - *Internal models of customer value make development and innovation slow.*

Final remarks...

- Customer data is becoming increasingly important as companies are adopting ***data-driven development*** practices.
- Mechanisms that help companies share and learn ***faster*** and more frequent from customers are critical.
- To effectively share ***qualitative and quantitative*** data helps companies answer the ‘if/what’ and the ‘how/why’.
- The shift towards data-driven development is not a technical implementation – it is a fundamental shift in ***culture and mind-set*** of the entire organization.



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Thank you!

aleksander.fabijan@mah.se

helena.holmstrom.olsson@mah.se

jan.bosch@chalmers.se