



Software Center

# Superset Platforms: Commodity Functionality as Technical Debt

Jan Bosch

Director Software Center  
[www.software-center.se](http://www.software-center.se)

Professor of Software Engineering  
Chalmers University of Technology  
Gothenburg, Sweden.

# Three Key Take-Aways

- Digitalization drives the adoption of Ops, i.e. DevOps, DataOps, MLOps, putting unique, new challenges on software platforms
- Superset software platforms are a necessity for DevOps
- Commodity variability becomes technical debt that needs to be resolved

# Overview

- Vem är jag? Wie bin ik? Who am I?
- DevOps
- Superset platforms
- Three layer product model
- Implications for variability
- Conclusion



TU/e



**intuit** **NOKIA**

# Software Center

Mission: To significantly improve the **digitalization** capability of the European Software-Intensive industry

**SIEMENS**

**ERICSSON**

**TOYOTA**

**SCANIA**

**JEPPESEN**  
A BOEING COMPANY



**CEVT**  
A Geely Auto Company



**MÄLARDALEN UNIVERSITY**  
**SWEDEN**



**GRUNDFOS**

**AXIS**  
COMMUNICATIONS



**BOSCH**

**qamcom**



**LiU**  
LINKÖPING  
UNIVERSITY

# RESEARCH THEMES

Continuous  
Delivery

Continuous  
Architecture

Metrics

Customer  
Data- and  
Ecosystems

Data

AI  
Engineering

AI

Software

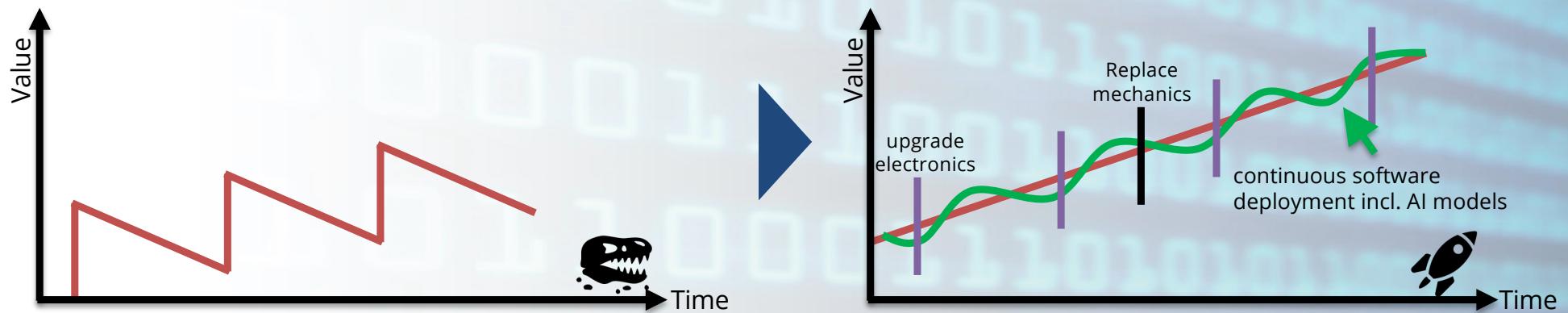
# Some Online Companies



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# Digitalization: the reason for DevOps



- Differentiation through mechanics and electronics is increasingly difficult
- To avoid commoditization, new solutions and services are required
- Digitalization of products, data from the field and changed business models can provide differentiation

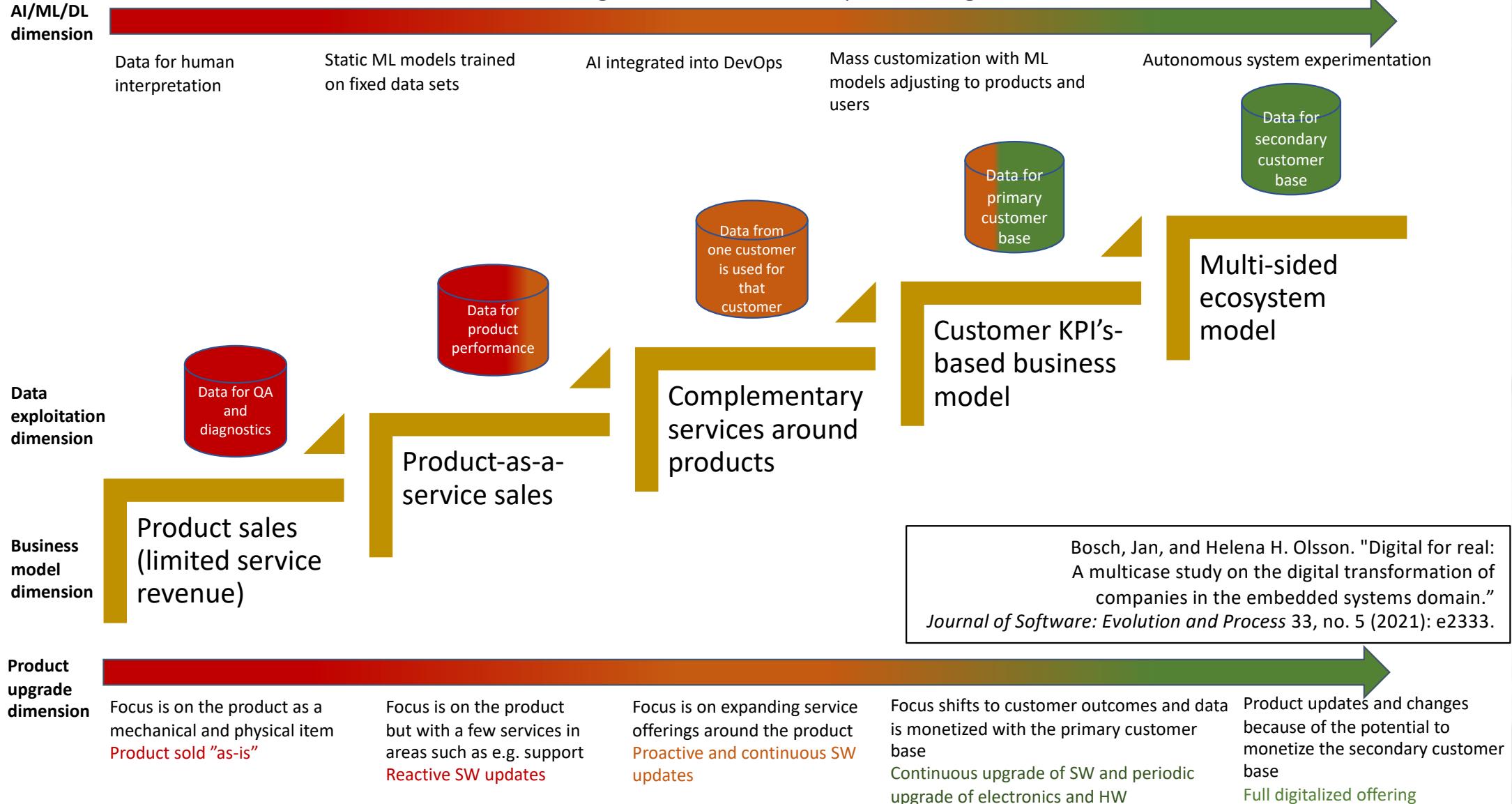
**Hypothesis:** growing revenue through new, *continuous* business models based on a *digitalized* product portfolio is the most promising strategy to increase differentiation and avoid commoditization

# How do we deliver value to customers?

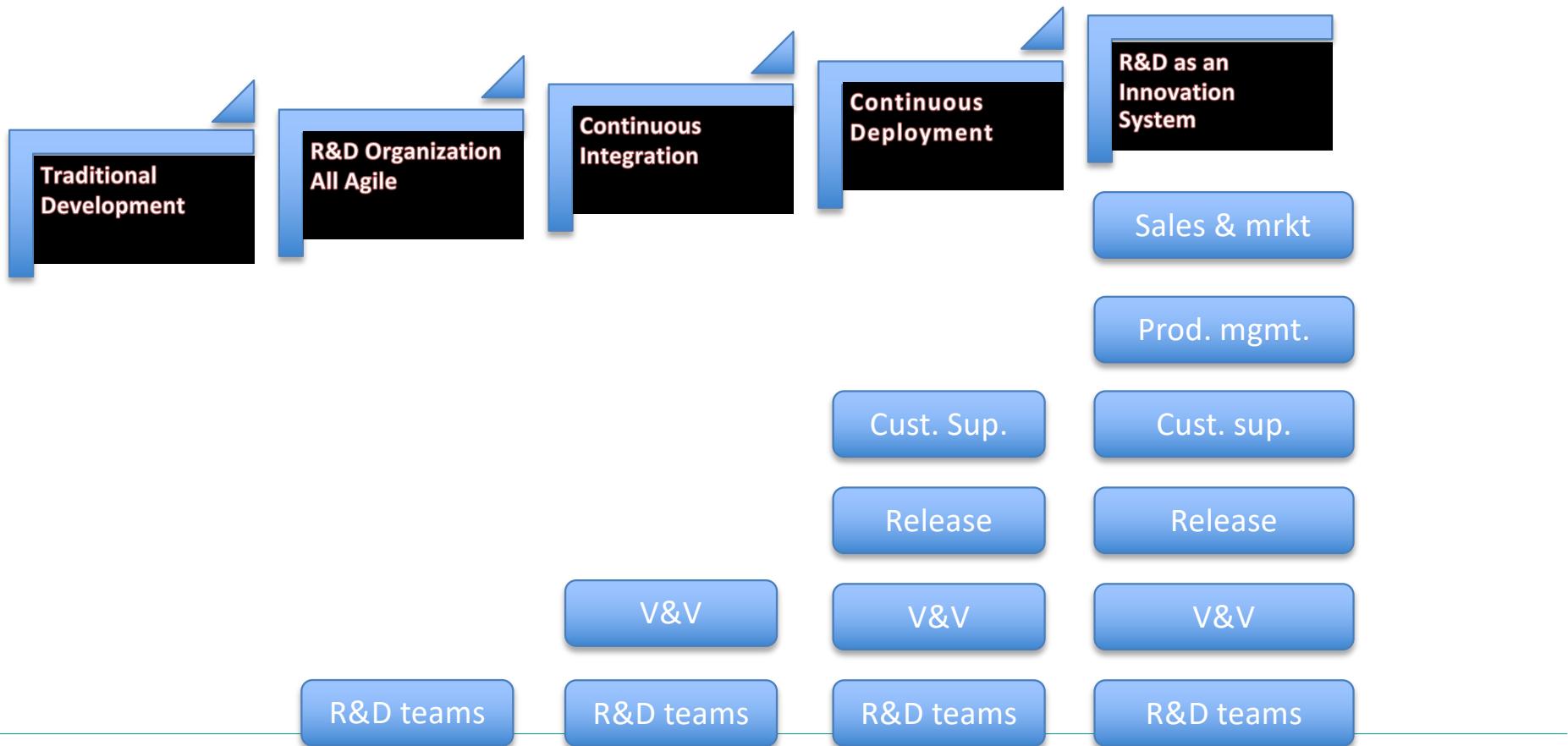
- Product generations
- Annual software updates
- DevOps, DataOps and AI/MLOps
- A/B testing
- Reinforcement learning

shortening of value delivery cycles

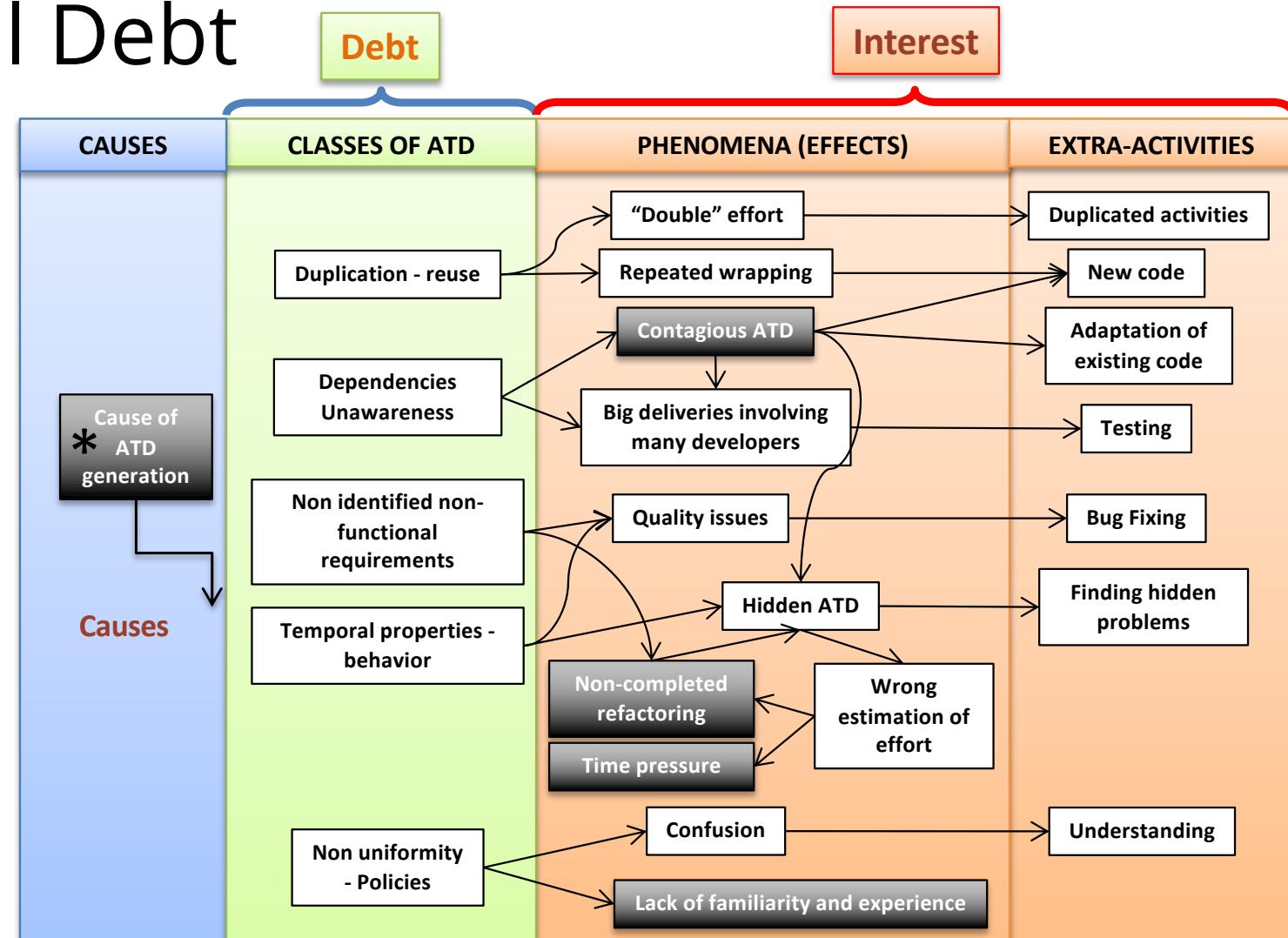
## From Traditional to Digital: The evolution path along four dimensions



# Stairway to Heaven: Speed



# Technical Debt



Martini, A., Bosch, J., Chaudron, M., 2014. "Architecture Technical Debt: Understanding Causes and a Qualitative Model",  
\* Best Paper Award at 40th Euromicro Conference on Software Engineering and Advanced Applications.

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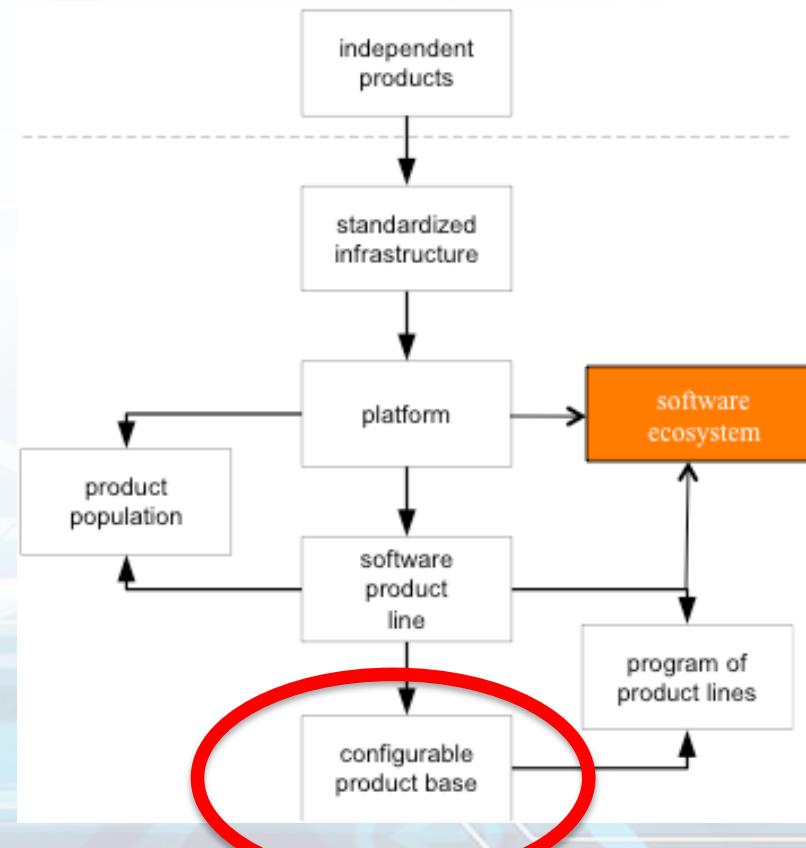
# Why Platforms?

- **Traditional:** share commodity functionality between products

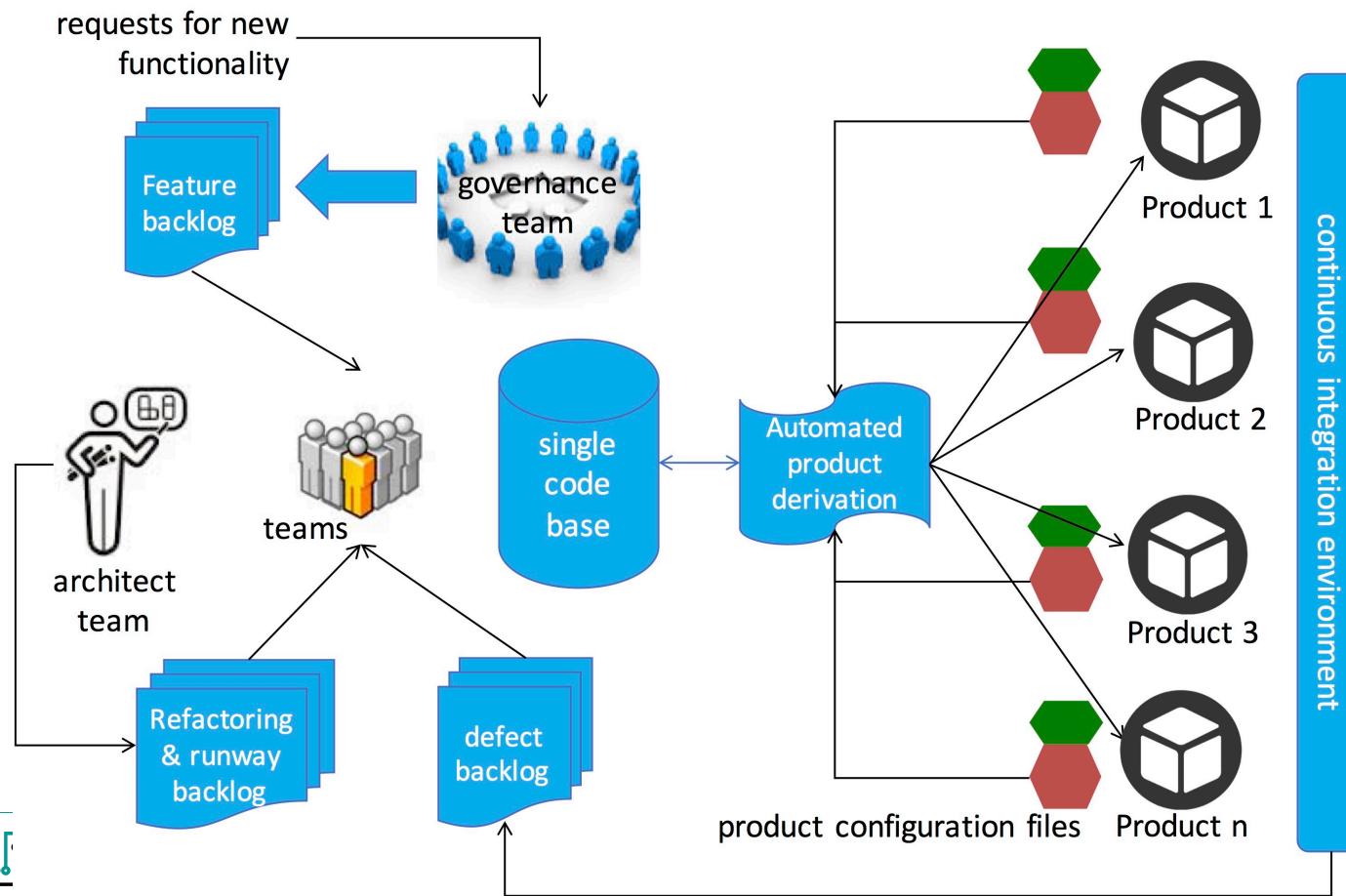
**Current:** support DevOps for a portfolio of products

- **Upcoming:** provide common API for rapid prototyping, 3<sup>rd</sup> party developers, partners and customers (your business ecosystem)

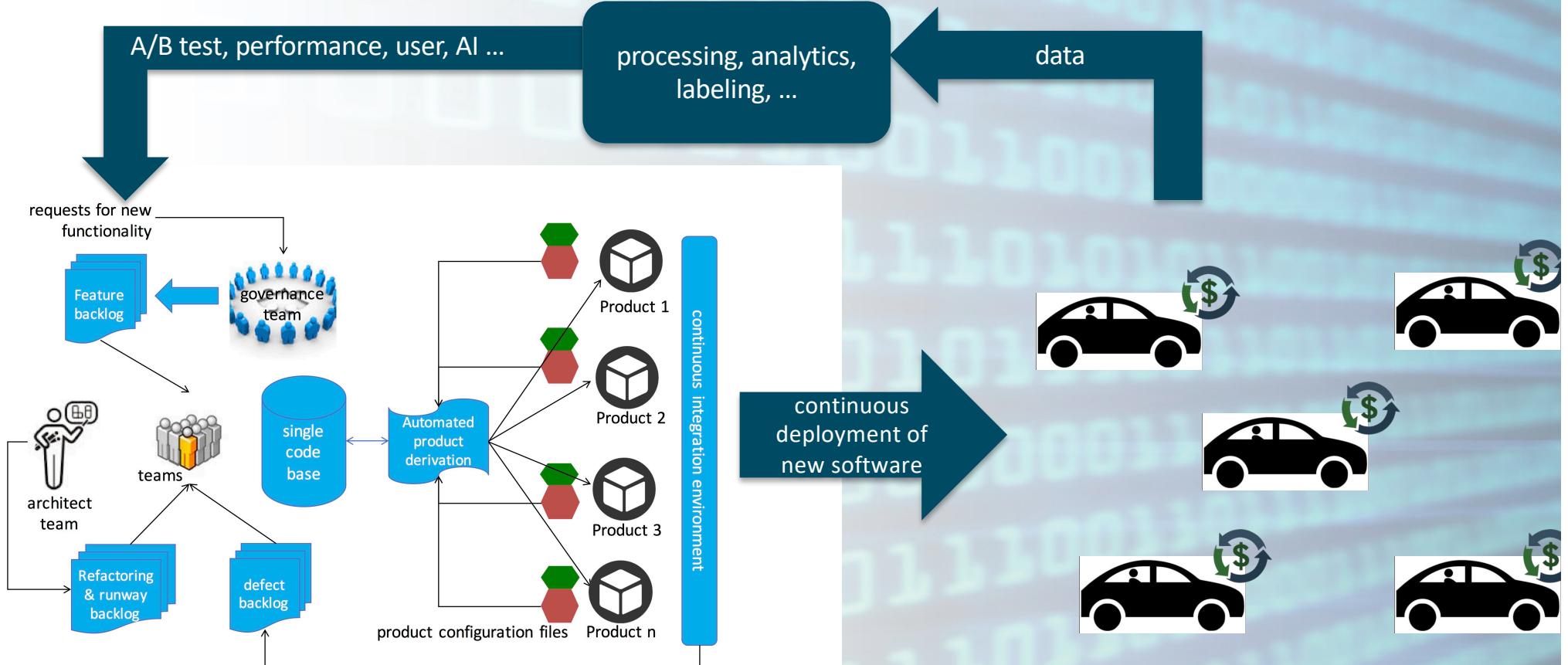
# Typical Architectural Evolution Path



# Continuous Delivery Model



# DevOps



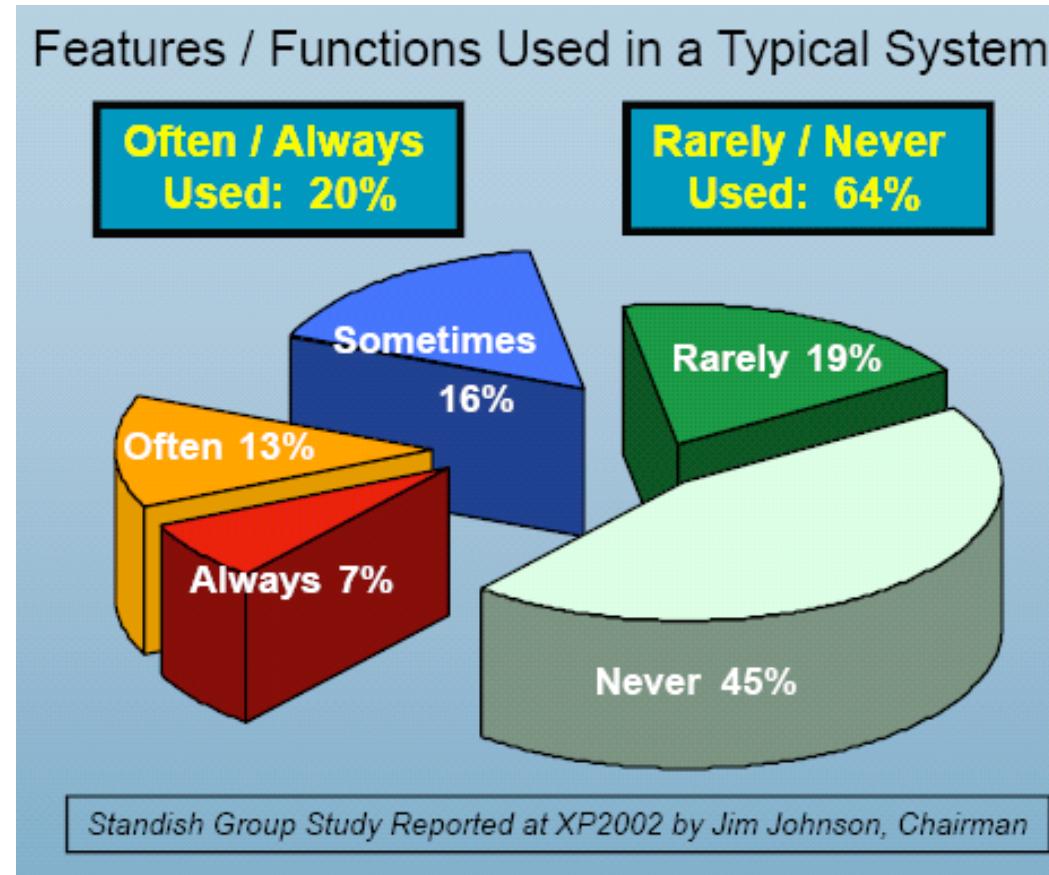
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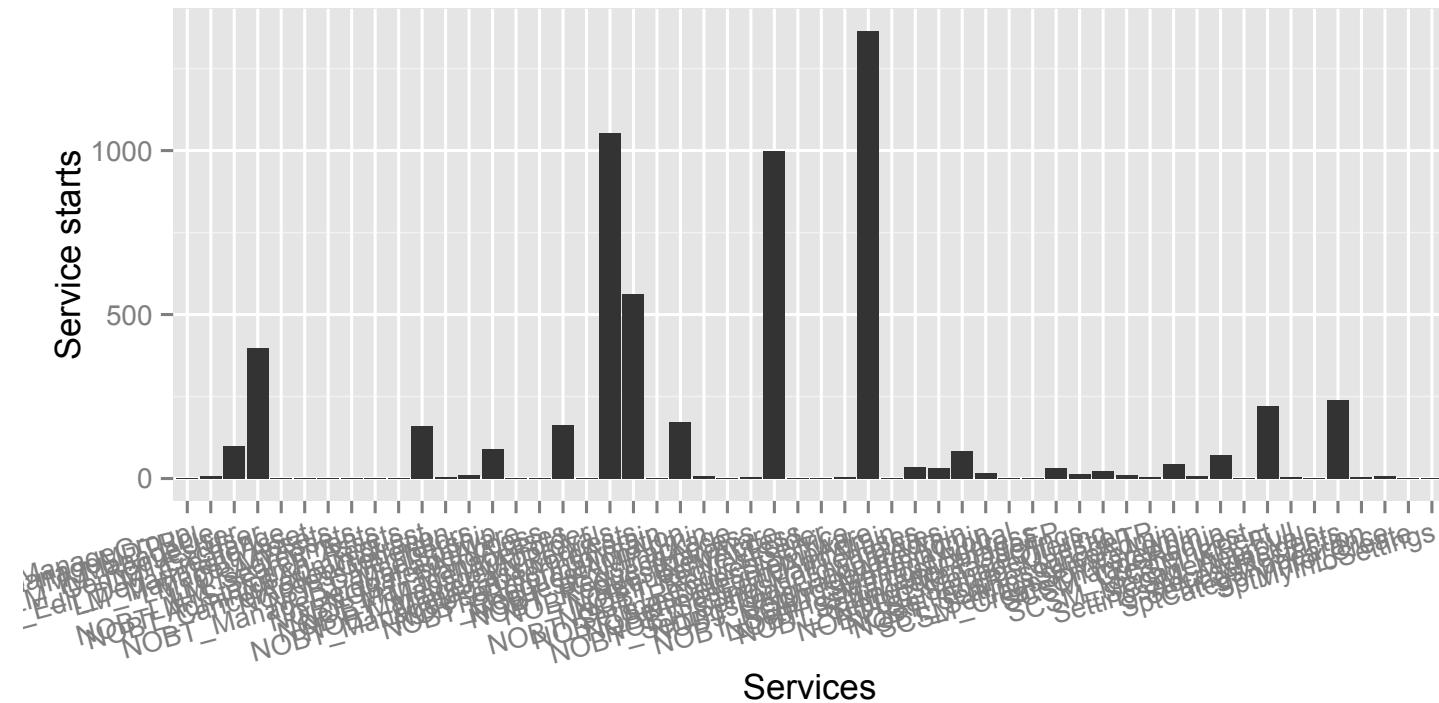


How do we  
know that  
we're actually  
delivering  
value  
customers  
care about?

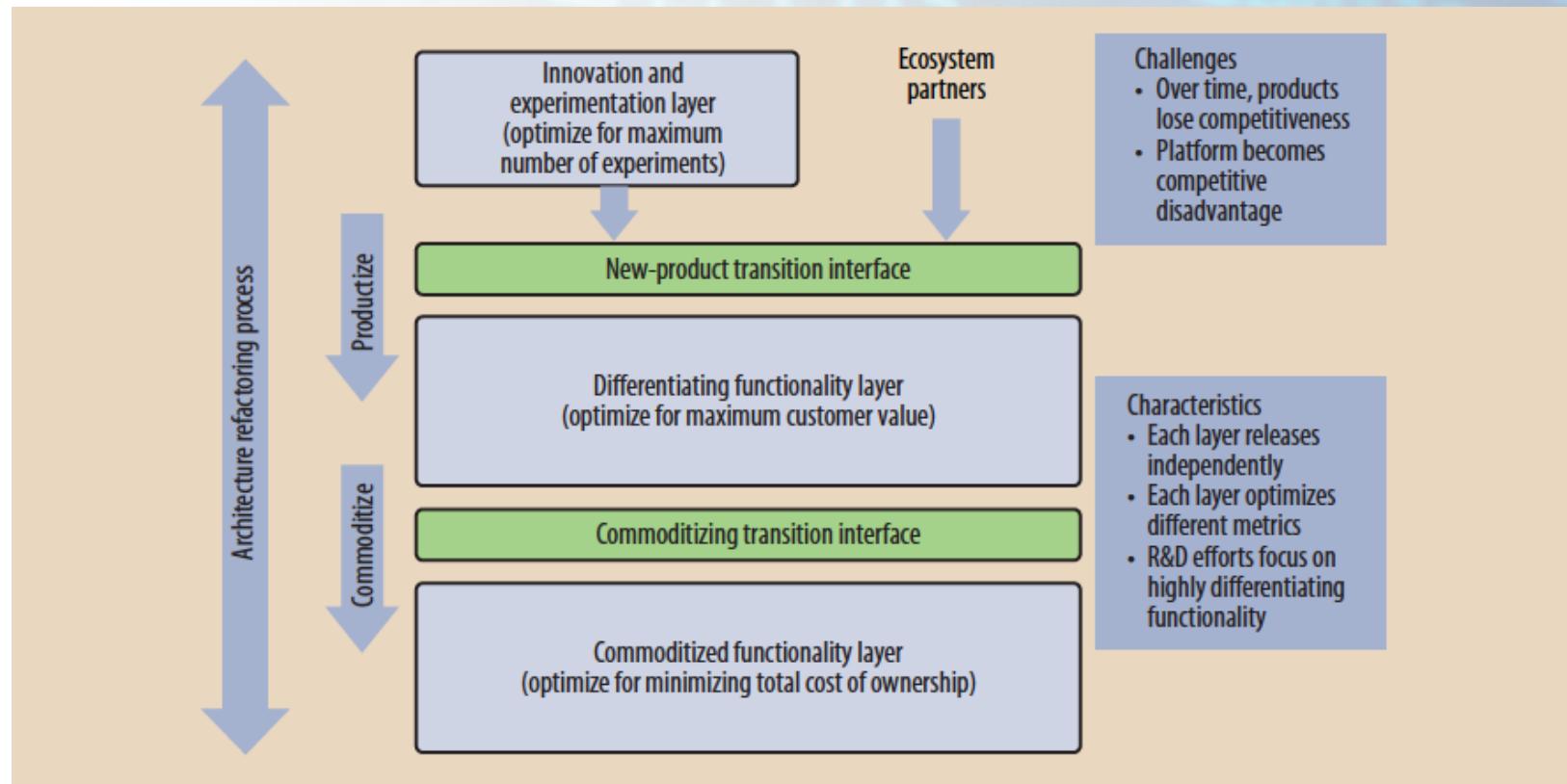
# “Featuritis”



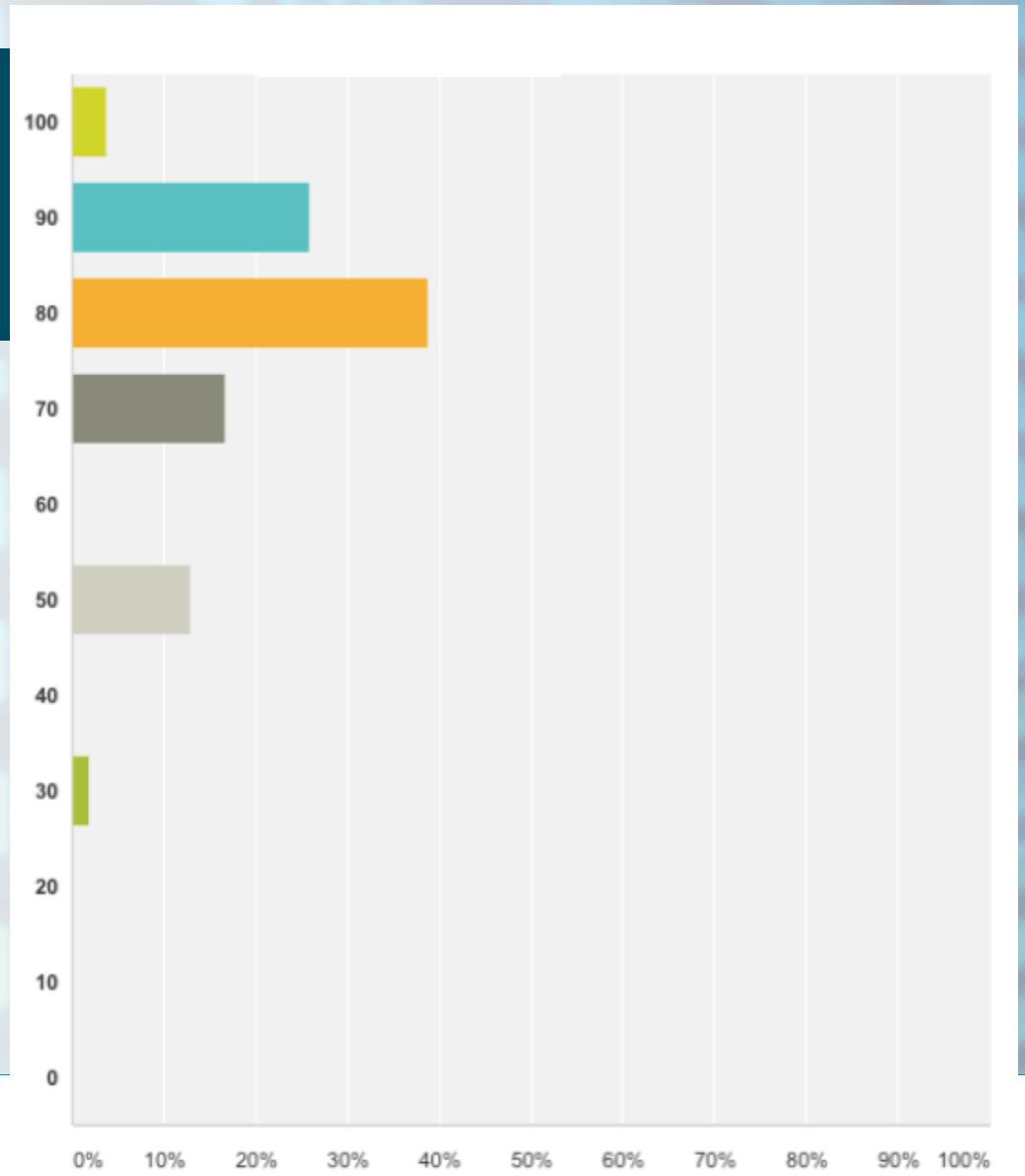
# Our Research ...



# Three Layer Product Model



# What % of R&D for Commodity?



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# Implications for variability

- Cost of variability is much higher in DevOps and superset platforms
- Variability in commodity layer is often technical debt as the business rationale for offering variability has disappeared
- Aggressive identification of obsolete variation points and removal of these has high RoI
- Failure to do so brings rapidly increasing “interest” with it

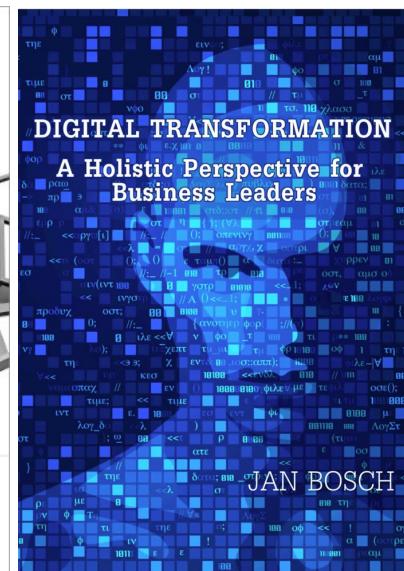
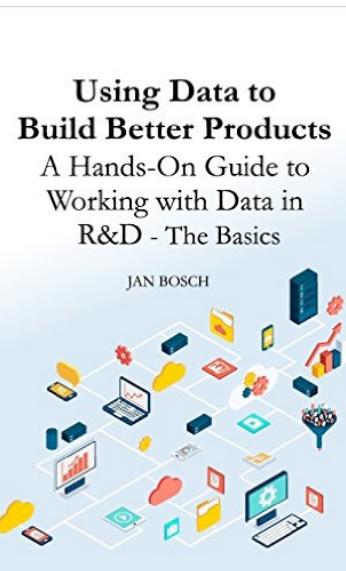
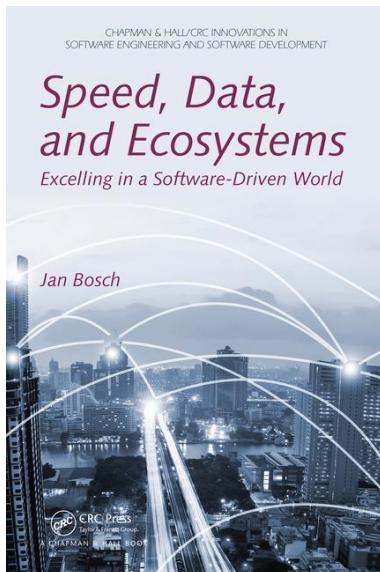
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# Learn More?





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[www.janbosch.com](http://www.janbosch.com)  
[jan@janbosch.com](mailto:jan@janbosch.com)

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