

This thing we call quality

Guest lecture
LiU



The Next 45 Minutes

Who am I?
Introduction

1. An every-day
example

2. What does
this mean?

3. Aren't there
standards?

4. So what is a
product, then?

Questions!

Who Am I?



Subject Matter Expert at
Group Function Technology

~23,000 R&D Personnel

Development Practices
Continuous Integration
Continuous Delivery
Continuous Deployment
Software Product Quality
Supply Chain Integrity
Data-Driven Practices

...



Research
Books

PhD, University of Groningen,
Netherlands

Continuous Practices
Pipeline Architecture
Test Automation
Exploratory Testing
Mob Programming

...



Associate Professor of
Software Engineering

Department of Computer
and Information Science

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Introduction



Quality is awesome. Who doesn't want quality?

Besides, we all know quality when we see it.



There is plenty of literature on quality, but how do we define it?

What is quality, really?



If we can't define it, then how do we manage it?

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An every-day example



Mixer



Cooker



Fridge

What constitutes high quality?

Noise level	< 65 dB	N/A	< 35 dB
Mean Time To Failure	> 500h	> 20'000h	> 150'000h
Energy efficiency (cost of ownership)	N/A	N/A	< 25 W
Aesthetics	Low priority	High priority	High priority

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An every-day example



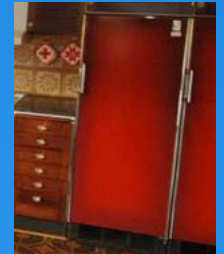
Mixer



Cooker



Fridge 2021



Fridge 1970

What constitutes high quality?

	Mixer	Cooker	Fridge 2021	Fridge 1970
Noise level	< 65 dB	N/A	< 35 dB	< 50 dB
Mean Time To Failure	> 500h	> 20'000h	> 150'000h	> 150'000h
Energy efficiency (cost of ownership)	N/A	N/A	< 25 W	N/A
Aesthetics	Low priority	High priority	High priority	Medium priority

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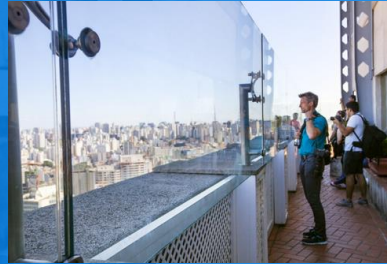
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An every-day example



Radio antenna



Order Care



Connected Vehicle

What constitutes high quality?

	Radio antenna	Order Care	Connected Vehicle
Availability	High	Low	Very high
Cloud Scalability	N/A	N/A	High
Usability	N/A	Very high	N/A
Physical aesthetics	Medium	N/A	N/A
Ease of assembly	Medium	N/A	N/A

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What does this mean?



The customer's subjective view of quality is their prerogative.

As a vendor we need to maintain an objective, quantitative view of quality.



There is a danger here: objective models of quality must not be used to explain away subjective customer experiences.



Doesn't this get awfully complicated?

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What does this mean?

(6) At the same time, another customer may have different targets or value other characteristics.

(3) To reliably satisfy customer expectations, we must identify and model those expectations, then measure and track our progress.

(8) Each point in this space can be represented by a set of customer expectations: $\{E_1 \dots E_n\}$

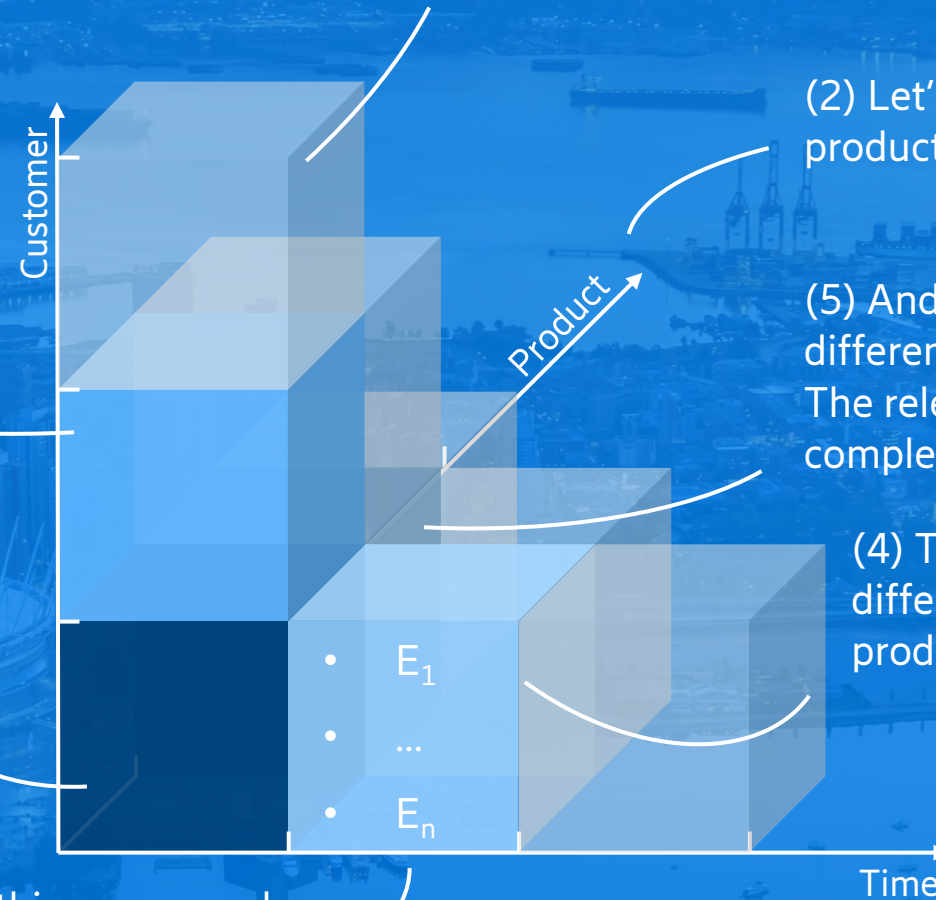
(7) Every intersection in this space is a customer expectation to understand. How do we do that efficiently, effectively and reliably?

(2) Let's leave "What is a product?" aside for now.

(5) And their expectations on a different product will not be the same. The relevant measures may be completely different.

(4) The same customer may have different expectations on the same product tomorrow or next year.

(1) Time is a function both of products maturing and of use cases evolving.



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Aren't there standards?



There are multiple standards attempting to define, structure and classify quality.



We love standards!

These can serve as a good starting point. They can help us figure out whether we have achieved "completeness".



But we still have a long way to go from there!

There inherent gap between the generically applicable and the locally actionable must be bridged.

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So what is a product, then?



What is the subject for which we want to track and publicize various aspects of quality?



This is not as straightforward as it might seem.

We sell various mixes of products, services and solutions, at various levels of abstraction.



It may be a component, it may be network, it may be a service, it may be a capability.

Often they are customized per customer.

In the end, which one truly matters? All of them? How do we keep track of them all?

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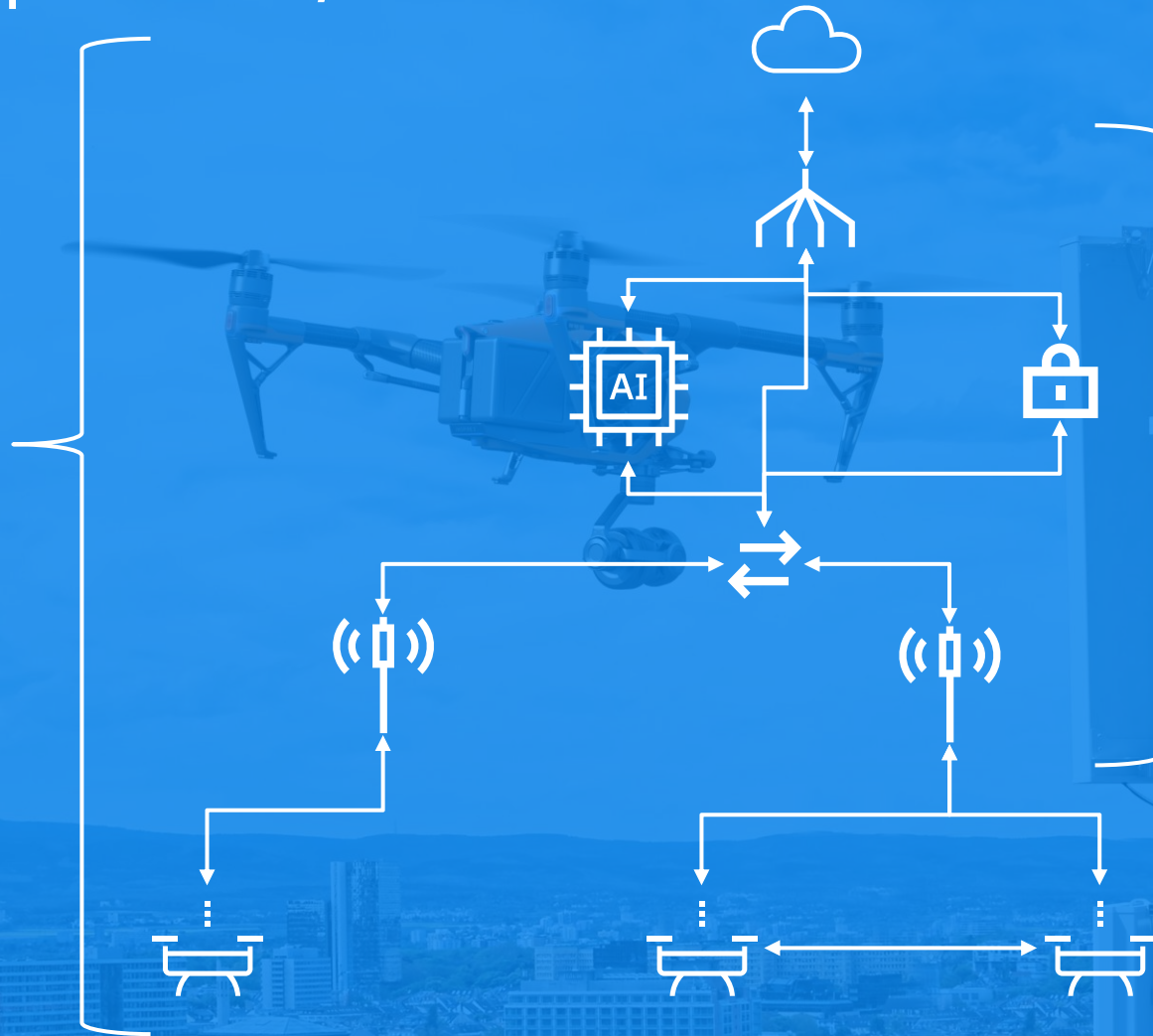
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So what is a product, then?

Hypothetical architecture
of proposed 6G use case:
Compute-as-a-Service



Hypothetical
scope of Ericsson offering

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