# Feedback-driven Product Development

how we do it at Lysaker and how you can design your own system



Cisco's development and innovation centre in Norway (Lysaker) develops videoconferencing products, telepresence technology and collaboration solutions. This is embedded product development involving advanced mechanics, customised electronics, movable parts and millions of lines of software mostly written in C and C++. Over the last two decades we have gradually established a workflow that very much supports lean and agile product development for hundreds of engineers working closely together. A lot of effort goes into establishing effective feedback loops guiding the whole development process. We are not only talking about rapid feedback from build systems and continuous integration, but also from regression tests, advanced scenario testing and real users. The focus on establishing feedback loops goes beyond the product development workflow, it is a principle applicable to the whole organization.

This talk will present a concrete insight into the software development workflow that we are using today, before discussing what you need to consider if you want to set up an equally effective feedback-driven product development workflow in your organization. The talk is relevant for everyone involved product development where software is a key component.

Olve Maudal, Cisco Systems Norway

a 60 minute keynote at Equinor Developer Conference, Sola, Norway, September 26, 2018





# Cisco Systems, Innovation Center Lysaker, Norway



# Telepresence



### Some of the stuff we develop at Lysaker







at Lysaker we are ~350 engineers

### we do...

### Electronics / Hardware



### Mechanics



## Industrial Design



1992





reddot award 2015 winner

# 2015

### User Experience Design



# Unboxing and Logistics



### Machine Learning and Artificial Intelligene



Webex Assistant (June, Teams)

Face recognition\* (Teams) only)



Noise suppression\*

Speaker tracking

**Best view** 

**In-room analytics** 

### Bots (Teams)



# Looking into



## the future

### but, by far, most of us work with

### software developement



At Lysaker we have been developing telepresence products and collaboration solutions for more than two decades (since  $\sim$ 1991)



"... an organization that develops spectacular products and outperforms all competitors"



- Effective feedback loops
- Slack
- Professionalism
- Focus on value
- Systems thinking
- Transparency
- Release early, release often



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### The most important ingrediences

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# The most important ingrediences • Effective feedback loops

## Facts about advanced product development





### Most projects are more like...

# extreme orienteering



# in impossible terrain











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http://www.youtube.com/watch?v=oetF3UTIwbc

## The main codebase



- embedded software development
- about 200 active software developers
- typically more than 100 commits per day
- 4-5 million lines of code, mostly C and C++
- visible traces back to the late 1980's
- ~20 products, ~50 builds

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# software development workflow





































### Example of visual feedback (HTML pages used by all/most developers)

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### continuous integration



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### **QA** Status









• Create a robust build system • Integrate continuously



- Create a robust build system
- Integrate continuously
- Grow professionalism

• Embedded? Create your own build system!

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- Integrate your test systems into your build system (--test-all)



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- Slim down your QA department





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- beware of the observer effect
- optimize for your top 80% developers

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# (Princess Leia)



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### About Agile Principles



There used to be a time, where we believed that anyone could do software development

after all, it was just about programming a computer...













3) find resources







3) find resources



## 4) execute according to the plan

### and when the projects failed



### the respons was always:



### create a more detailed plan



### find more resources


## and make sure that everyone followed the plan



### but the projects still failed



### and the respons was, as usual:









Milestone

but of course...



#### Dark ages of software development (early 80's to late 90's)





I) get some smart people to analyze the problem





3) find resources



# 4) execute according to the plan

We had only discovered a fancy way of playing the "scabby queen" game, also known as the "Old Maid" or "Svarte Per", always try to "save your ass" by delegating responsibility to someone else.





### There must be a better way...







#### The Agile Manifesto (2001)

#### **Manifesto for Agile Software Development**

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools Working software over comprehensive documentation Customer collaboration over contract negotiation Responding to change over following a plan

> That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck Mike Beedle Arie van Bennekum Alistair Cockburn Ward Cunningham Martin Fowler James Grenning Jim Highsmith Andrew Hunt Ron Jeffries Jon Kern Brian Marick

Robert C. Martin Steve Mellor Ken Schwaber Jeff Sutherland Dave Thomas

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The agile manifesto started a huge awakening process in the software industry...



(picture from the 1990 film Awakenings)

processes and tools comprehensive documentation contract negotiation following a plan

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Individuals and interactions Working solutions Customer collaboration Responding to change



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### Seven Enemies of Agile

Plans Commitments Pressure Objectives Documentation Inspection Procedures







### Everyone has a plan 'till they get punched in the mouth. Mike Tyson



#### Commitments















#### Documentation





# Inspection









### Seven Enemies of Agile

Plans Commitments Pressure Objectives Documentation Inspection Procedures



# Seven Friends of Agile



# Seven Friends of Agile

### Planning



Seven Friends of Agile

Planning Collaboration


Planning Collaboration Slack



Planning Collaboration Slack Direction



Planning Collaboration Slack Direction Communication



Planning Collaboration Slack Direction Communication Reflection



Planning Collaboration Slack Direction Communication Reflection Principles







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Planning Collaboration Slack Direction Communication Reflection Principles



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