



Aalto University  
School of Science

# TU-C2030

## Operations Management Project

*Timo Seppälä*

**No technology is universally applicable. There is no single technology innovation that can act as a master key to unlock all potential systems solutions. Systems solutions are always combinations of several innovative technologies.**

# Future technological innovations are hard to predict?

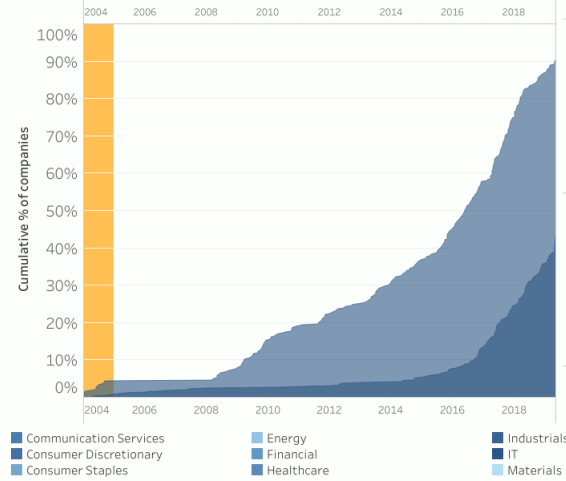


2010

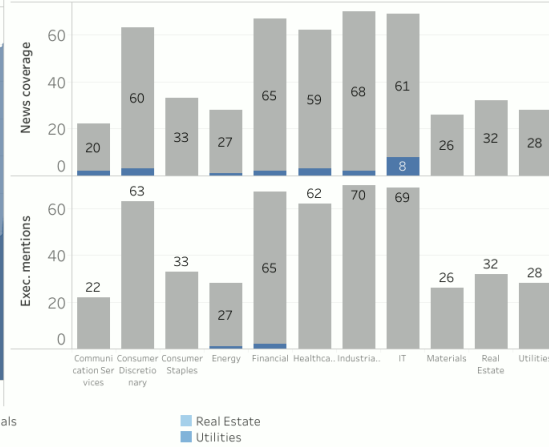
2015

Year 2004

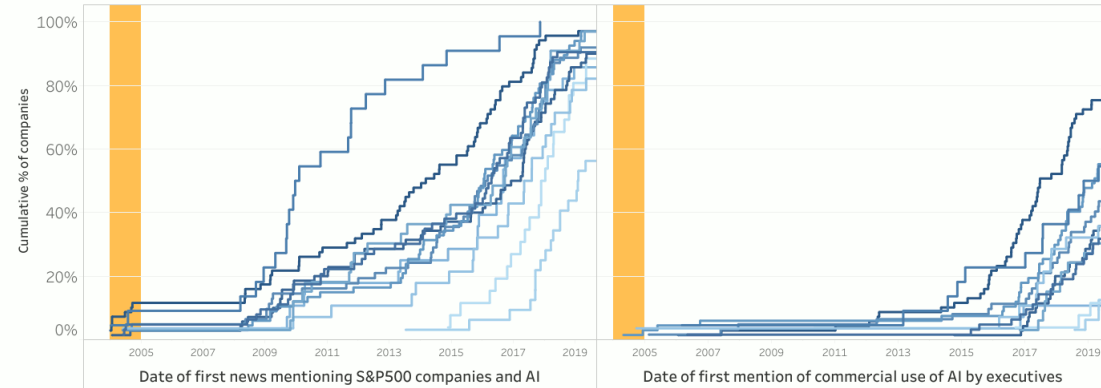
AI diffusion based on news & executives reporting commercial use



Media coverage & reporting commercial use of AI by executives (number of companies by sector)



Company news mentioning AI and reporting of commercial use of AI by sector



# Predictive technologies, programming and the ownership of data

We Can't Let John Deere Destroy the Very Idea of Ownership

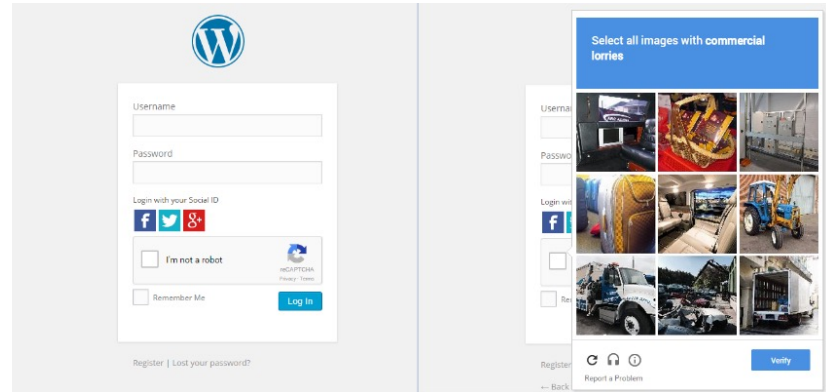
<https://www.wired.com/2015/04/dmca-ownership-john-deere/>

Will Billions of iPhones Help Apple Be the First Tech Company to Fulfill Its Dream of Being a Bank?

<https://observer.com/2022/06/will-billions-of-iphones-help-apple-it-be-the-first-tech-company-to-fulfill-its-dream-of-being-a-bank/>

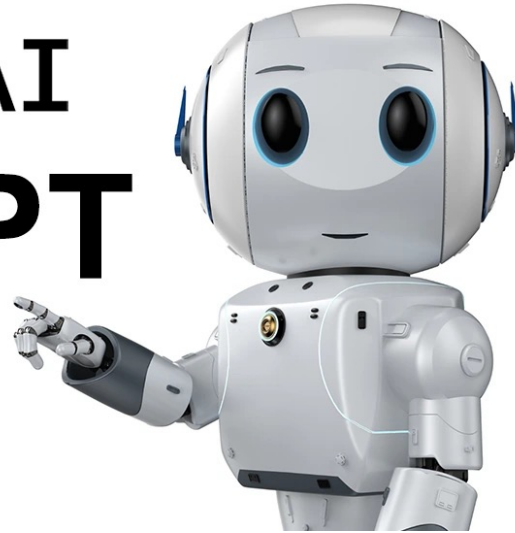
“The ownership of a device (asset) is the default situation of data management when no contractual arrangements or the like have been made.”

# Predictive technologies and programming



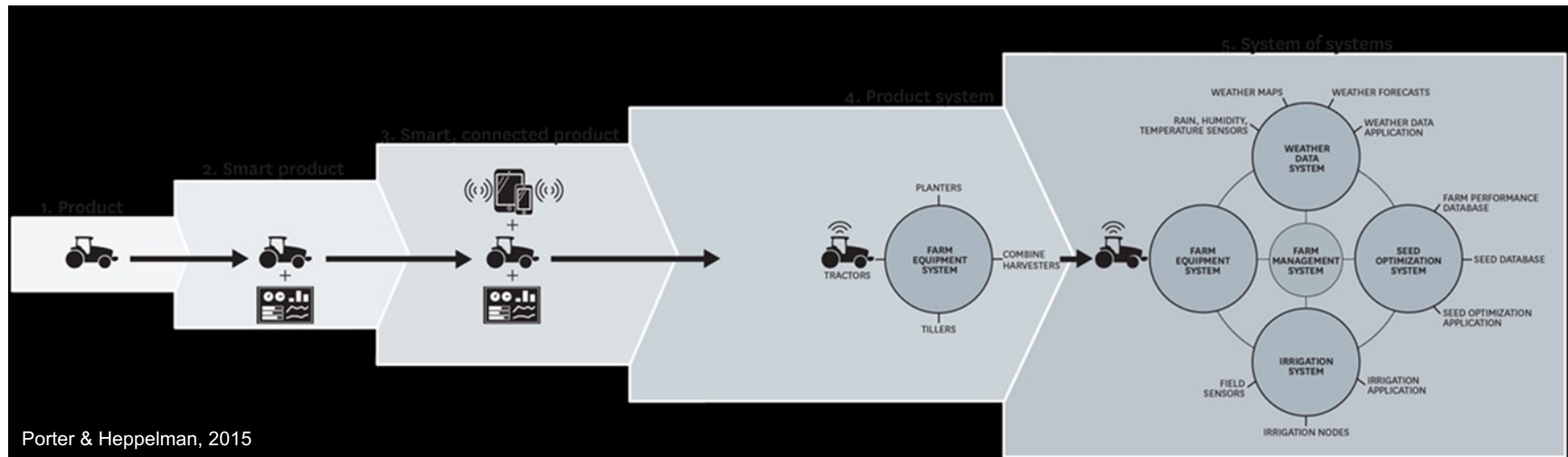
# Predictive technologies, programming and human in the loop

 OpenAI  
**ChatGPT**



## To be used for what? Knowledge work only?

“The industrial Internet, and/or Internet of Things, is now / still really more of an intranet—most data never leaves a product, factory or a company’s firewall.”





# Predictive technologies, programming and internal data strategy



## **Proprietary data (Company)**

What data classifies as proprietary data for your company?

## **Inner circle data (Contracts)**

What data classifies as contract data for your company?

## **Distributed data (Industry Alliances)**

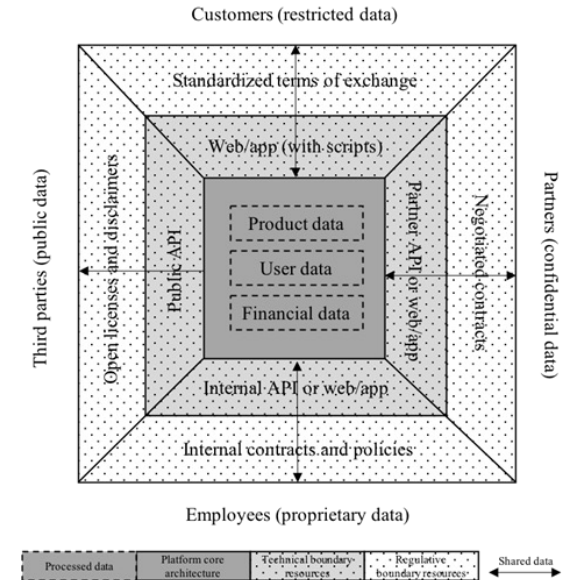
What data classifies as industry for your company?

## **Open data (Open)**

What data classifies as open data for your company?

# Predictive technologies, programming and internal data strategy

- Internal contracts and policies
- Negotiated contracts
- Standardized terms of exchange
- Open licenses and disclaimers



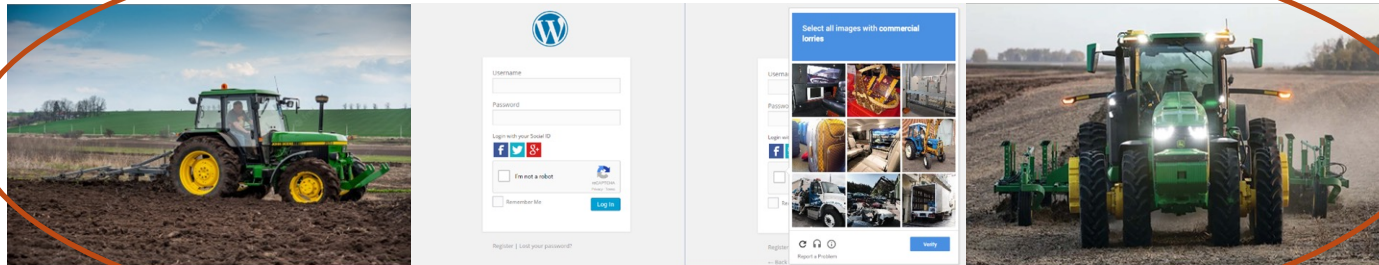
# Predictive technologies, programming and external data sources



ABB Ability Marketplace™ - Empowering Digital Transformation

[https://new.marketplace.ability.abb/s/?language=en\\_US](https://new.marketplace.ability.abb/s/?language=en_US)

John Deere is slowly becoming one of the world's most important AI companies - Nothing runs (autonomously) like a Deere



2015

2022

# New customer value from predictive technologies



Andritz: Smart Woodyard - Autonomy as a side product



Sandvik: AutoMine® is a product group for autonomous and remotely operated mobile equipment.

# Predictive technologies, programming and system of systems

Five key properties, in the so called 'Maier's criteria':

**Firstly**, the individual systems must be operationally independent, so that if the system of systems is disassembled, the individual systems can still independently perform in a useful manner.

**Secondly**, the individual systems must be managerially independent, meaning that they are mostly acquired and integrated independently.

**Thirdly**, the individual systems are geographically widely distributed, and can typically readily exchange information but not physical things, such as mass or energy.

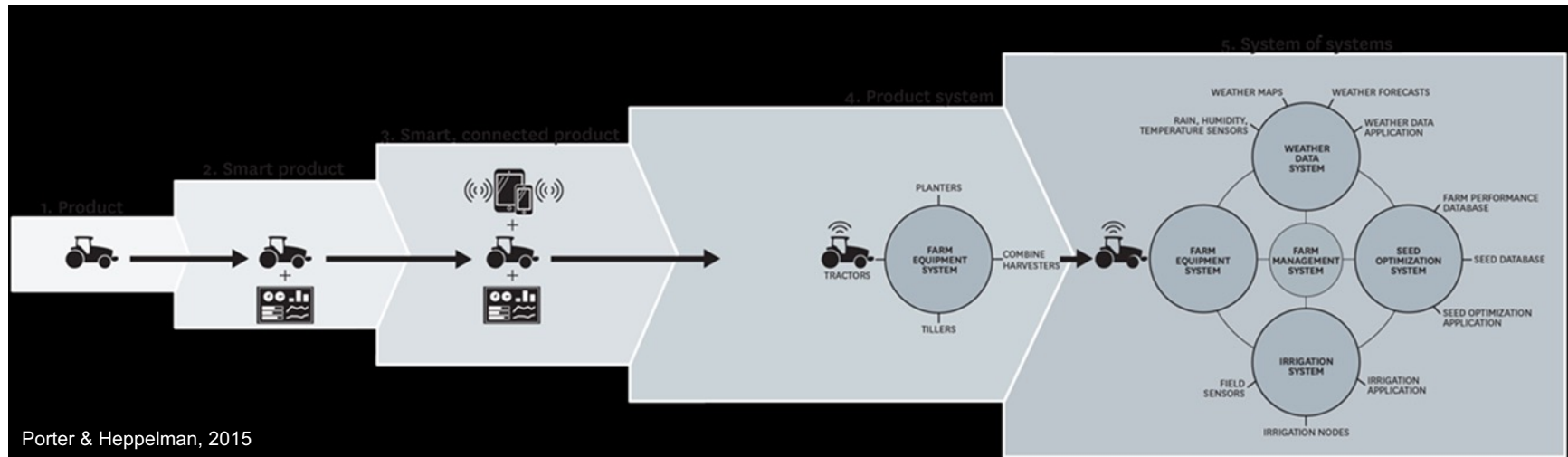
**Fourthly**, the system of systems must be capable of emergent behaviour, so that as a collective it can perform higher functions which do not reside in any of the individual systems.

**And lastly**, the system of systems exhibits constant evolutionary development where structure, function, and purpose are continuously added, modified, and removed over time





“The industrial Internet, and/or Internet of Things, is now / still really more of an intranet—most data never leaves a product, factory or a company’s firewall.”





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# Cases

- Introduction to the course:
  - 6.9 at 12:15 – 13:45
- Case presentations:
  - 13.09 (12:15 – 14:00);
  - 20.9 (12:15 – 14:00);
  - 27.9 (12:15 – 14:00)
- Cases handed in as PowerPoint presentations
  - *Recommended length: 7-12 slides*
  - *Aim for neat presentation slides, but explain your logic and reasoning in the note's pages*
- For each case session, 3-5 groups are chosen to present their case. (10 – 20 min minutes presentation + discussion!)

# Project – practical issues

- Deadlines:
  - *Registration of topic, group and organization*
    - First meeting with your “coach” / approving your project “title”
  - *Second (and possible more) meeting with your coach at a stage where it helps you most (however before your presentation to the company / the final report submission)*
  - *Project plan: to be agreed separately with each project group*
  - *Project report: December 1<sup>st</sup>*
- More info
  - *Project fact sheet – in MyCourse*
  - *Project plan and report guidelines – in MyCourse*
  - *If you have a potential topic and want to check whether it would be suitable, please drop an e-mail!*

# Project – practical issues

- *Your task is to apply theory into practice: solve a real life operations management problem in a group of (3-) 4 students*
  - *Problem solving approach + Design approach - Group can be different one than in cases or OM assignment*
- *The assignment is carried out for a real organization (company, public sector, society...)*
- *You are responsible for finding the organization- you and the organization define the actual research problem*
  - *It can be clearly focused to a task that is reasonably sized; It includes an improvement aspect; It is possible to obtain data for analysis about the phenomenon; **You as a group find it interesting!***
- *Start looking for the organization and topic right away! –*
- *The results of the study reported in a 25-50 page report – and a concrete improvement for the organization*

# Confidentiality

The reports will be read only by the course staff members.

No public presentation; no access for other parties.

- *I.e. the reports are treated confidentially*

After grading

- *The electronic files will be deleted after the grading is completed.*
- *The paper versions will be stored in a locked drawer for one year, and will be destroyed after that*
- *For your own sake, keep a copy!*

Generally, NDA's are not signed by the staff

Sometimes disguising sensitive information is may be necessary

- *From the grading point of view, the most interesting is the method and the logic; very accurate cost information etc are secondary if the logic is clear.*

# Tools

## 1. Academic Phrasebank

- <http://www.phrasebank.manchester.ac.uk/>

## 2. Libproxy.aalto.fi

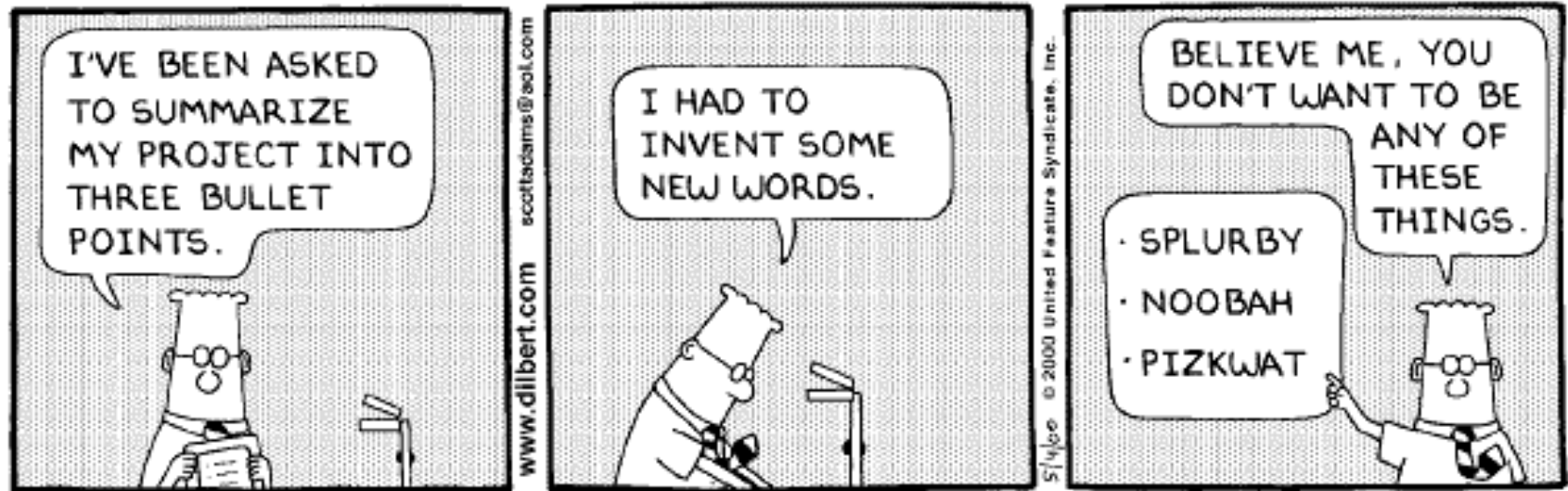
- Google Scholar
- SciVerse Scopus

## 3. "The art of making a literature review"

# Cases available

1. Hypo-konserni / Ari Pauna

With good planning, analytic & creative spirit, team work & support from coaches your project will NOT be like this...



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