

UiO : Institutt for informatikk

Data, information, and digital representations

IN5210 Autumn 2021

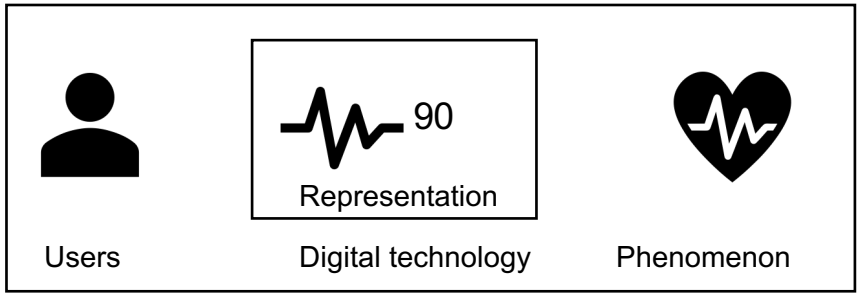
Alexander Kempton
Digital Innovation Research Group

Lecture content

- Information Systems perspectives and core concepts
- Current trends and their consequnces
- Examples
- Reflection assignments for seminar #4

Burton-Jones and Grange (2012, p. 636), digital technology is used for an enormous variety of tasks, but the “core purpose of all such systems is to help people understand the states of some real-world systems that are relevant to them [...] at the most general level[; representations enable] users to act in the world

Representational view

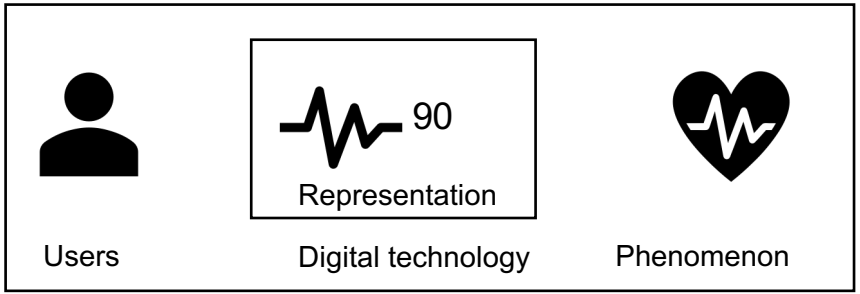


- How can we design useful representations?
- How can users organize and learn to use these representations to reach their goals?

Concept	**Definition**
Data	Symbols processed by machines (McKinney and Yoos 2019)
Representations	Sets of data which are syntactically structured to represent a phenomenon

Evolutionary-historic view

- Information systems consist of users, information processing, technologies, data and representations, shared patterns (Watson 2014)
- Example questions
  - How does the processing of information improve goal fulfilment?
  - What are the critical elements of an information system that enhance cooperation?
  - How do we design an information system to transform the nature of information exchange in a specified manner?
- How has this changed over time?





18 jars of pig fat – Balli 4 jars of pig fat – Nimgir-ab-lah. Fat dispensed (at ?) the city of Zabala. Ab-kid-kid, the scribe. 4th year 10th month.



Session Edit Goto Utilities(M) System Help

Batch Input: Session Overview

Analysis | Process | Statistics | Log | Recording

Selection criteria

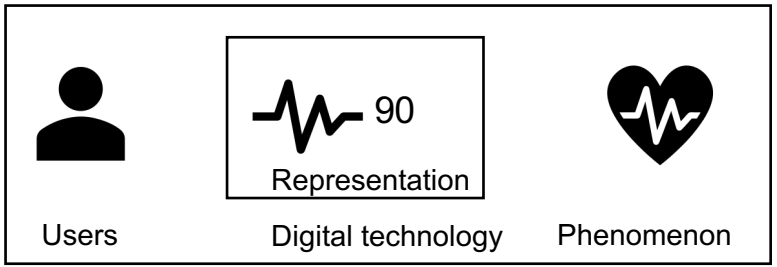
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WE/RE 2005		ZECHA	20.12.2005	13:07:19	RFWERE00		ZECHA	78	0	78	390		05
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Sessions Found: 194

How do technological changes make us rethink the representational view?



MIS Quarterly

ISSUES & OPINIONS

DIGITAL FIRST: THE ONTOLOGICAL REVERSAL AND NEW CHALLENGES FOR INFORMATION SYSTEMS RESEARCH[1]

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The classical view of an information system is that it represents and reflects physical reality. We suggest this classical view is increasingly obsolete: digital technologies are now creating and shaping physical reality. We call this phenomenon the ontological reversal. The ontological reversal is where the digital version is created first, and the physical version second (if needed). This ontological reversal challenges us to think about the role of humans and technology in society. It also challenges us to think about our role as IS scholars in this digital world and what it means for our research agendas.

Keywords: Digital, digital ecosystems, ontology, ontological reversal, human experience, human values


Sourcing and generating
(->data)
Transformations
(data->representations)
Use, value, effects
(representations ->people&environment)

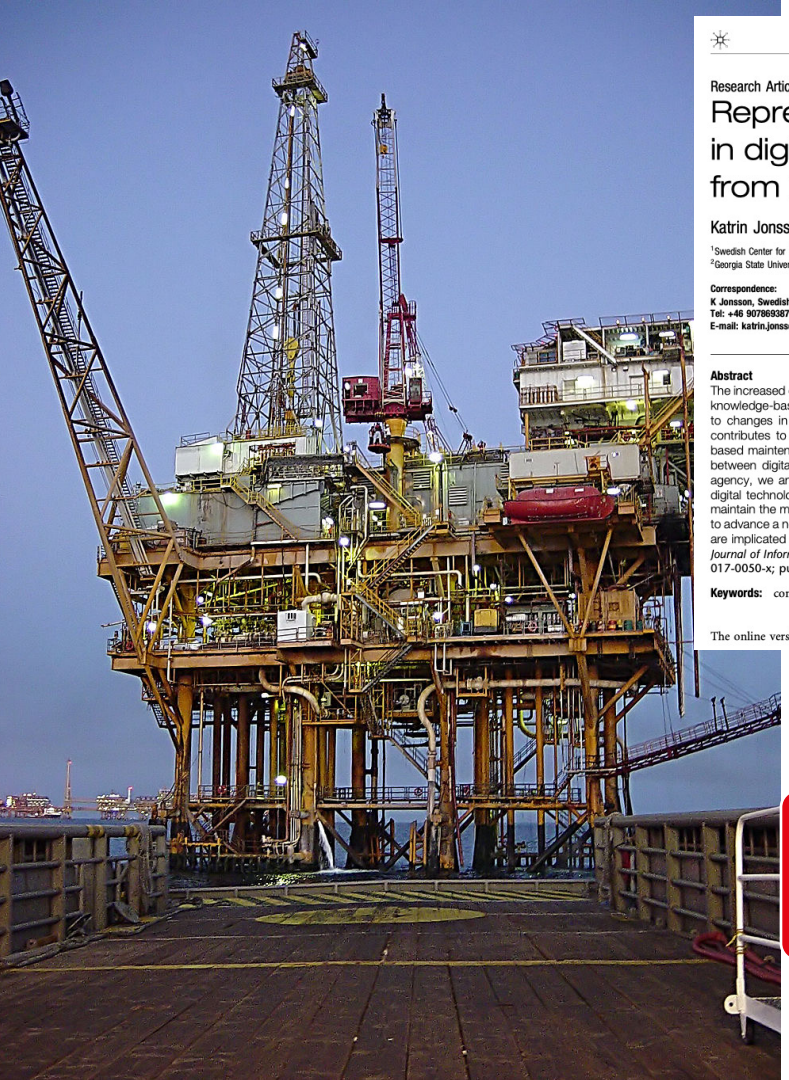
Current trends: some characteristics

Generating and sourcing	Transformations	Use, value, effects
Volume, velocity, variety	Machine learning (From deductive to inductive models)	Ubiquitous use
Online activity, sensors, traces	Distributed processing	Novel service models
Data ecosystems	Complexity	Shapes our behaviour and environments
…	…	…

Current trends: some characteristics

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Data ecosystems	Complexity	Shapes our behaviour and environments
…	…	…

Reflection assignment #1:
Are there other characteristics we should add to this table?



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Research Article

Representation and mediation in digitalized work: evidence from maintenance of mining machinery

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Abstract
The increased digitalization of work results in practices that are increasingly networked and knowledge-based. As such, we need to continuously inquire *how* digital technology leads to changes in work and not be content knowing *that* it leads to change. This paper contributes to advancing such knowledge through an analysis of digitalized condition-based maintenance of machinery in a Swedish iron ore mine. Drawing on the distinction between digital representation and digital meditation figurations of human and material agency, we analyze how the distributed network of workers used a diverse portfolio of digital technologies to make complex knowledge-based decisions on when and how to maintain the mining machinery. We combine these empirical insights with extant literature to advance a new theoretical perspective on how key characteristics of digital technologies are implicated in networked, knowledge-based work practices.
Journal of Information Technology (2018) **33**, 216–232. https://doi.org/10.1057/s41265-017-0050-x; published online 4 January 2018

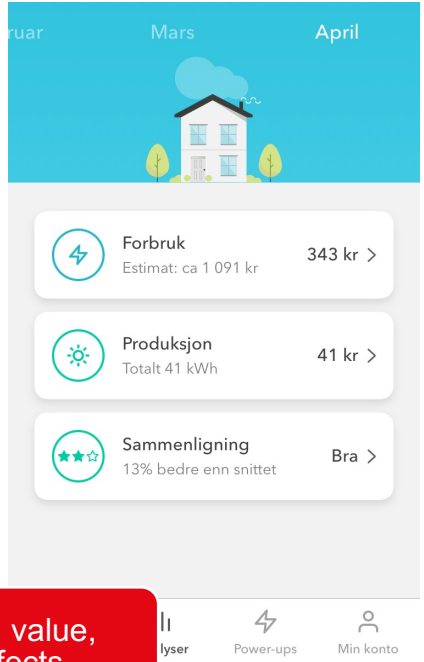
Keywords: condition-based maintenance; figuration; digital representation; digital mediation

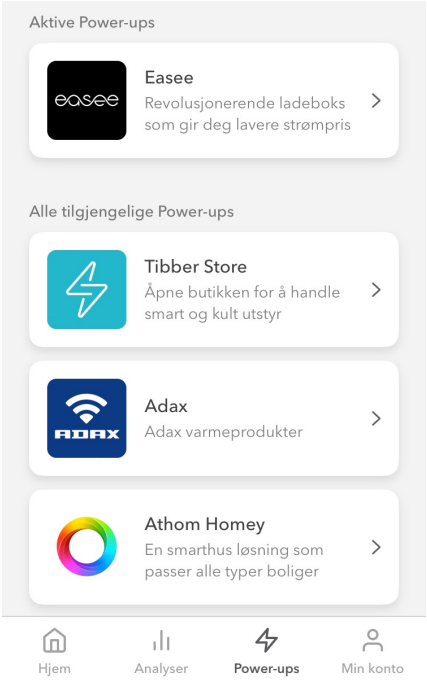
The online version of this article is available Open Access

Sourcing and generating (->data) → Transformations (data->representations) → Use, value, effects (representations->people)

Example: tibber

- Nordic company offering energy as a service
  - Electricity at market cost
  - Entails integrated data on energy consumption and production, which allows (and automates) power saving and load balancing for the consumer
- **Data generating and sourcing**
  - Data from an ecosystem of energy-related technologies (home automation, heating, charging stations, weather data, etc)

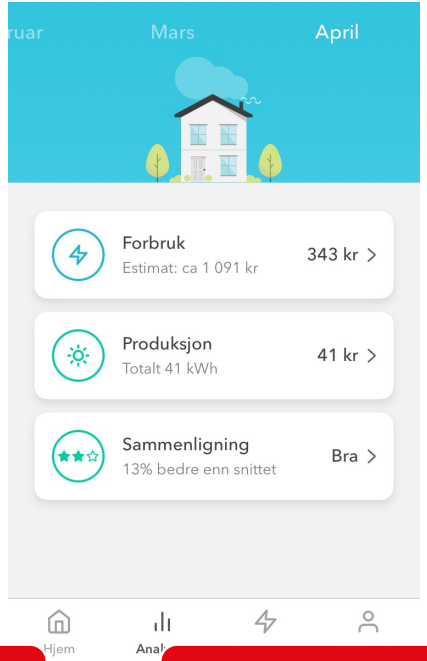


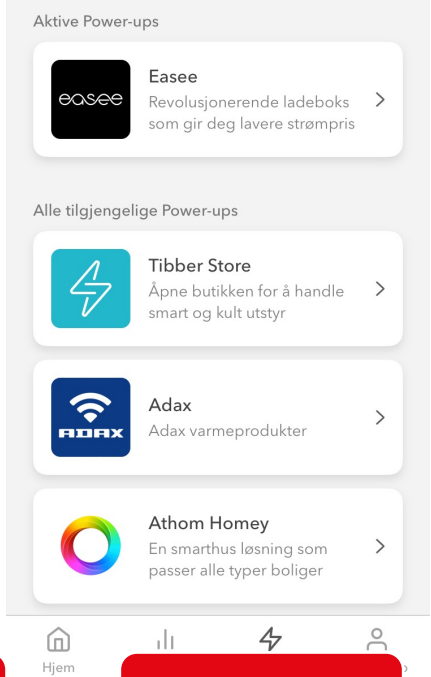


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Example: tibber

- **Transformations**
  - An energy platform that combines data from the ecosystem and exposes it consumers through an app
  - Data is analyzed and transformed to reveal energy consumption patterns
- **Use and effects**
  - Concurrent and multi-functional use of data
  - Shapes consumer behaviour
  - Gets an «upper hand» in the energy market because data from customers are combined with other data and used for predictions
  - Future as an «aggregator» role: load balancing and calibrating as green energy makes the energy market more unstable

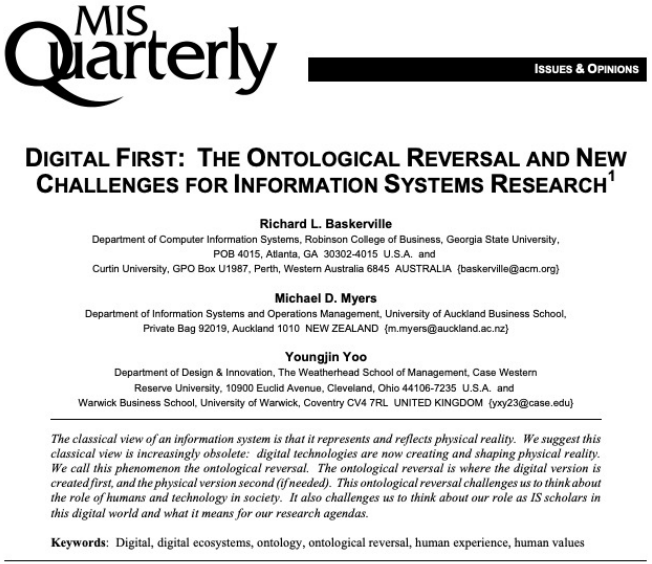




Sourcing and generating (->data) → Transformations (data->representations) → Use, value, effects (representations->people)

Reflection assignment #2

- Think of a digital application, platform, or service you use
- How do interacting with the representations in this app/platform/service allow you to interact with people or things that would not have been possible in a non-digital world?
- What kind of data do you think are necessary to create these representations?
- Do you think there any negative or critical aspects to the data generation, transformations or effects related to them?



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