UPPSALA UNIVERSITET

Doctoral Course Management, Organisation, ICT.

Meeting 4, May 18, 2022.

Organizational Memory

Jan Lindvall

Department of Business Studies

Uppsala university

Agenda (times, approx.)

10.15- 11.00 Presentation – Organizational Memory Thru Data Base/s & Data Warehourses/Datalakes Organizational Routines

11.00 -11.15 Discussion – ”small groups”: Routines & Artifacts.

13.00 – 13.45 Presentation – Jan Löwstedt

13.45-15.00 Comments/Questions articles

UPPSALA UNIVERSITET

A Reminder: Paradigm (”Logics”) – ”Models” – Concepts: **Structur & Actor.**

”Once a paradigm, model, or concept achieves a dominant position, it functions as a new ‘‘structure’’ in Giddens’ (1984) sense, exercising ‘‘downward pressure’’ that shapes subsequent action by creating a **taken-for-granted frame of reference, associated routines and artifacts, and new interests vested in the new status quo.** Paradigms, models, and concepts are thus all structures ‘‘stretching across time-space’’, but they vary in their generality, pervasiveness, and durability: **paradigms are more durable than models, and models more durable than concepts.** As a result, management innovation progresses—via the mutual constitution of **agency and structure**—from concepts to models to paradigms, challenging and eventually changing those structures”.

Bodrrozic & Adler, *The Evolution of Management Models: A Neo-Schumpeterian Theory*, p 111.

A Reminder: Business Process & Knowledge Management

”…yielded **the business process** model and contributed to a new organizational paradigm, the **network.** Here IT was deployed to **outsource** all non-core activities and to rationalize the management of both internal and supply-chain processes. But this cycle led to the **neglect of human involvement** and **weakened the innovation-generating** capacity of firms, provoking a secondary cycle that led to the **knowledge management** model. There is some continuity of knowledge management with prior paradigm-balancing models, but we see conceptual innovation around the idea of **community of practice**.”

Bodrrozic & Adler, The Evolution of Management Models: A Neo-Schumpeterian Theory, p 107.

UPPSALA UNIVERSITET

New design – new roles and routines: microfoundations!

”As the intellective skill base becomes the organization´s most precious resource, managerial roles must function to enhance its quality. Members can be thought of as being arrayed in concentric circles around a central core, which is the **electronic data base**.”

- Range of responsibilities
- Time frames (real-time?)
- Accountable for cross-functional integration.

Zuboff, 1988, *In the Age of The Smart Machine*, p.396

UPPSALA UNIVERSITET

Why memory and routines?

”As a pattern of behaviour becomes routinized, **search is reduced** or eliminated, thereby improving efficiency.

…memory reduces the **need for search** by storing the results of prior successful performances. Hence, memory is central to the formation of routines, as well as their persistence. Over time, as **agents** discover and remember successful actions, memory displaces search by informing actions, and producing recognizable, repeated problem-solving patterns.”

Miller, et al, 2012, ”Dynamics of Performing and Remembering Organizational Routines”, p 1538

UPPSALA UNIVERSITET

Memory & Routines (Miller, et al, 2012, ”Dynamics of Performing and Remembering Organizational Routines”.

Ostensive & Performative

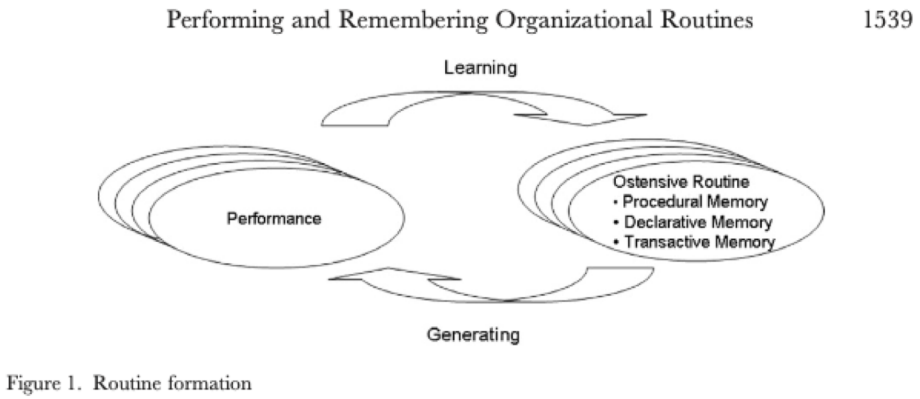


Figure 1. Routine formation

Different types of memory

- Procedural: Know-how
- Declarative: Know-what
- Transactive: Know-who

UPPSALA UNIVERSITET

”The MAP”: Data architecture – a definition.

”A company’s **data architecture** describes **how data is collected, stored**, **transformed, distributed, and consumed.** It includes the rules governing structured formats, such as databases and file systems, and the **systems for connecting data with the business processes** that consume it. Information architecture governs the processes and rules that **convert data into useful information.**

Dallemulle & Davenport, 2017, What´s your Data Strategy?

UPPSALA UNIVERSITET

The Map: Data Ecology: Small and Big- Data Architecture (Kelleher & Tierney)

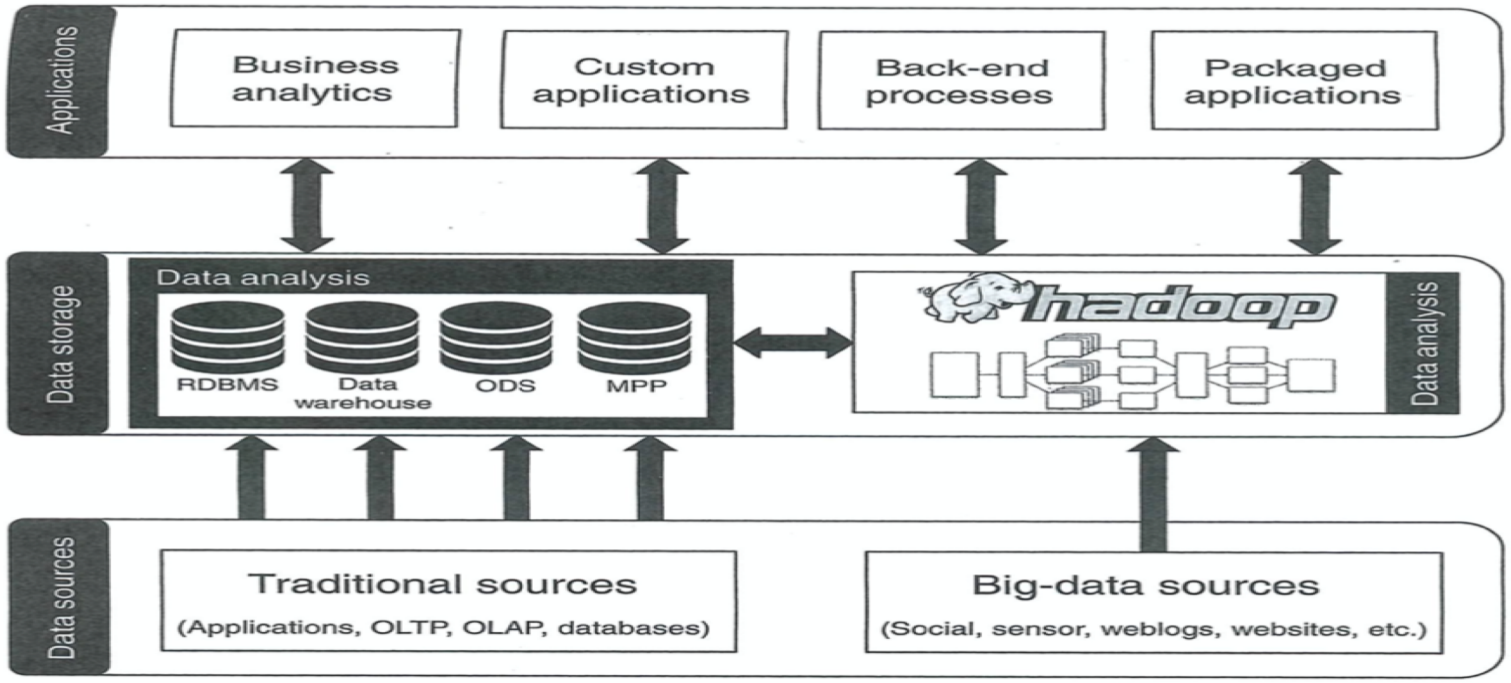


Figure 6 A typical small-data and big-data architecture for data science (inspired by a figure from the Hortonworks newsletter, April 23, 2013, https://hortonworks.com/blog/hadoop-and-the-data-warehouse-when-to-use-which).

Data Warehouse Framework

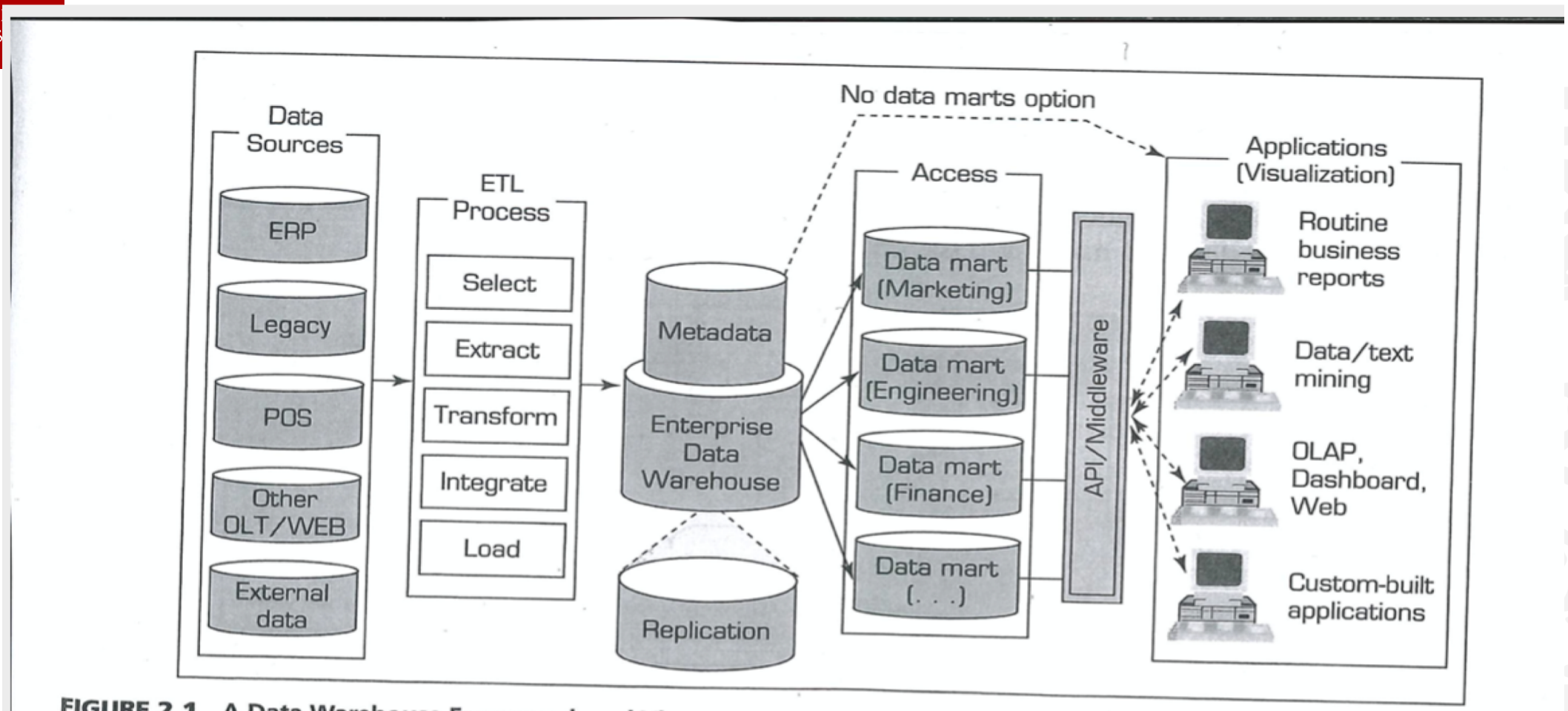


FIGURE 2.1 A Data Warehouse Framework and Views.

UPPSALA UNIVERSITET

How to store data: Spreadsheet or Database? Oracle´s view

Databases and spreadsheets (such as Microsoft Excel) are both **convenient ways to store information**. The primary differences between the two are:

- How the data is stored and manipulated
- Who can access the data
- How much data can be stored

Spreadsheets were originally **designed for one user,** and their characteristics reflect that. They're great for a single user or small number of users who don't need to do a lot of incredibly complicated data manipulation. **Databases,** on the other hand, are designed to hold much larger collections of organized information—massive amounts, sometimes. Databases allow **multiple users** at the same time to quickly and securely access and query the data using highly complex logic and language.

UPPSALA UNIVERSITET

Database & Relational databases (Codd, 1970)

Database: A central repository of data.

”**Relational databases** store data in **collection of tables** where each table has a **structure of one row** per instance and one columne per attribute. Links between tables can be created by having **key attributes** appear in multiple tables. This structure is suited for **SQL queries** which define operations on the data in the tables.”

Glossary, Data Science

UPPSALA UNIVERSITET

Data Quality: Storing and Accessing Data

Data Storage Terminology

- Character
- Field
- Record
- File
- Database

EmpID	Last Name	First Name	Title	Hire Date	Address	City	State	Zip Code
101	Labbe	John	Sales Representative	02/28/99	9065 Arlington Road	Cincinnati	OH	45238
102	Grissom	Andrew	Accountant	03/05/98	312 Production Dr	Dayton	OH	45239
103	Laver	Mitchell	Finance Manager	04/08/01	1062 Whirlway Dr	Aurora	IN	45226
104	Prosser	Margaret	Accountant Staff 1	02/21/97	919 New Haven Road	Cincinnati	OH	45248
105	Buckhalter	Nancy	Maintenance Specialist	09/07/98	8595 Stonebridge Dr	Florence	KY	41042–3563
106	Singh	Ravi	Accountant Staff 2	10/27/01	677 Ridge Ave	Cincinnati	OH	45241
107	Klinger	Robert	Accountant Staff 2	09/30/01	1605 Deercroft Court	Harrison	OH	45030–2009
108	Courdell	Anne	HR Coordinator	07/21/02	8425 North Bend Rd	Cincinnati	OH	45242–3706
109	Sampson	Jessica	Sales Representative	09/06/99	617 Sheppherd Dr	Villa Hills	KY	41017

Exhibit 13-1
Data Hierarchy

SO 2 Methods of storing data and the interrelationship between storage and processing

UPPSALA UNIVERSITET

What is database software? (and RDBMS)

”Database software is **used to create, edit, and maintain database files** and records, enabling easier file and record creation, data entry, data editing, updating, and reporting. The software also handles **data storage**, backup and reporting, multi-access control, and security. **Strong database security is especially important today, as data theft becomes more frequent.** Database software is sometimes also referred to as a “database management system” (DBMS).

UPPSALA UNIVERSITET

What is a **database management system** (DBMS)?

”A database typically requires a comprehensive database software program known as a database management system (DBMS). A DBMS serves as **an interface between the database and its end users** or programs, **allowing users to retrieve, update, and manage** how the information is organized and optimized. A DBMS also facilitates oversight and control of databases, enabling a variety of administrative operations such as performance monitoring, tuning, and backup and recovery.”

Examples of popular database software or DBMSs: MySQL, Microsoft Access, Microsoft SQL Server, FileMaker Pro, Oracle Database, and dBASE.

UPPSALA UNIVERSITET

The Need for Normalized Data

Relational databases consist of several small tables. Small tables can be joined in ways that represent relationships among the data.

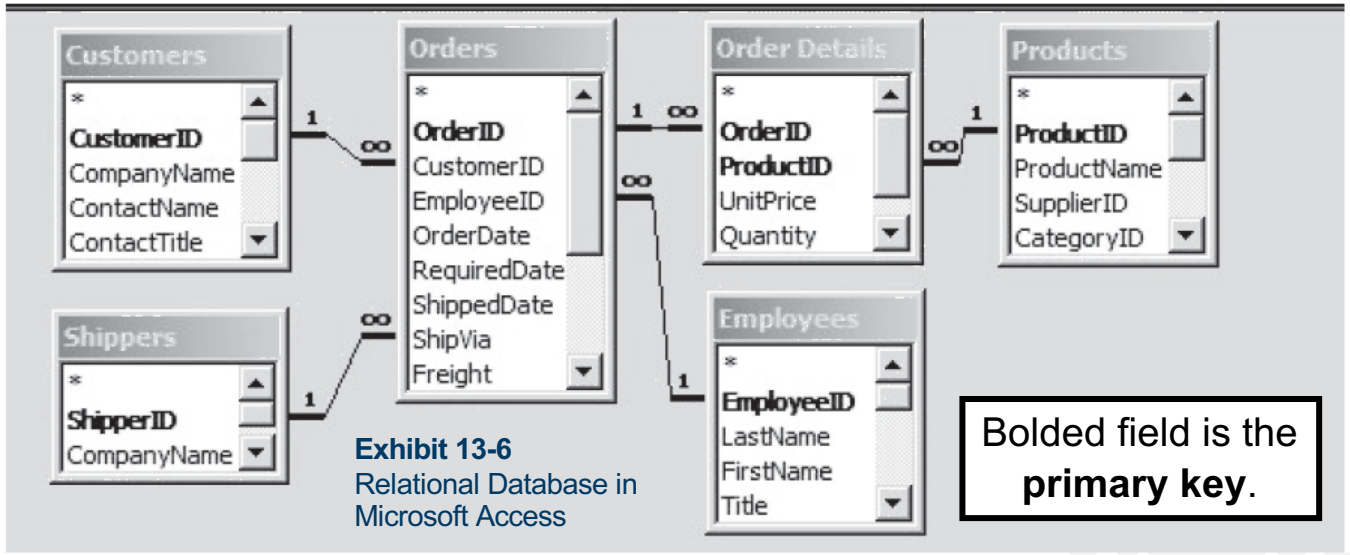


Exhibit 13-6
Relational Database in Microsoft Access

SO 5 The need for normalization of data in a relational database

UPPSALA UNIVERSITET

Four characteristics for a data warehouse

Data warehouses offer the overarching and unique benefit of allowing organizations to analyze large amounts of variant data and extract significant value from it, as well as to keep a historical record.

- **Subject-oriented.** They can analyze data about a particular subject or functional area (such as sales).
- **Integrated.** Data warehouses create consistency among different data types from disparate sources.
- **Nonvolatile.** Once data is in a data warehouse, it's stable and doesn't change.
- **Time-variant.** Data warehouse analysis looks at change over time.

UPPSALA UNIVERSITET

OLAP (Online **Analytical** Processing) – and how to use it?

”OLAP operations generate summaries of historical data and aggregate data from multiple sources. OLAP operations are designed to generate report-type summaries and enable users to slice, dice, and pivot data in a dta warehouse using a predefined set of dimensions of the data, such as sales by stores, sale by quarter, and so on.”

Glossary, Data Science

UPPSALA UNIVERSITET

OLAP & Data Cube

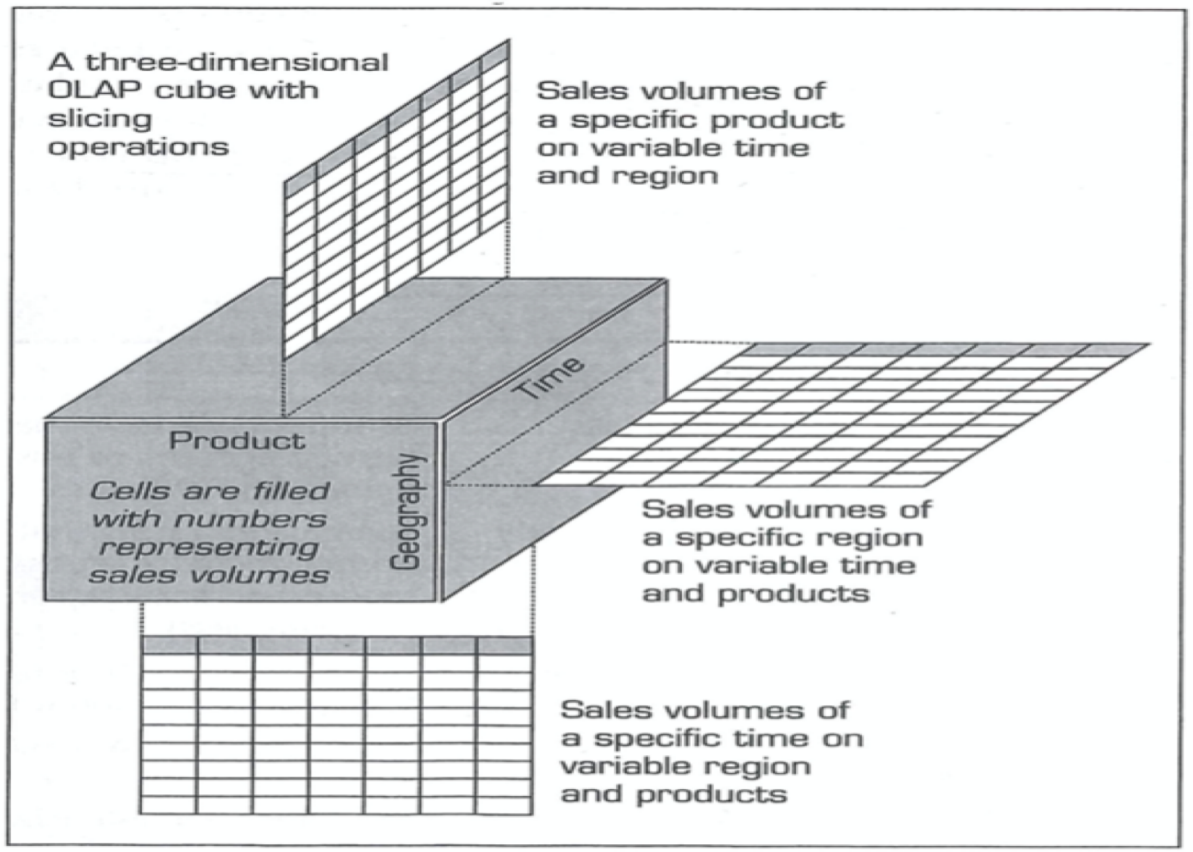


FIGURE 2.9 Slicing Operations on a Simple Three-Dimensional Data Cube.

ETL - **E**xtract **T**ransform **L**oad

ETL Visualisation

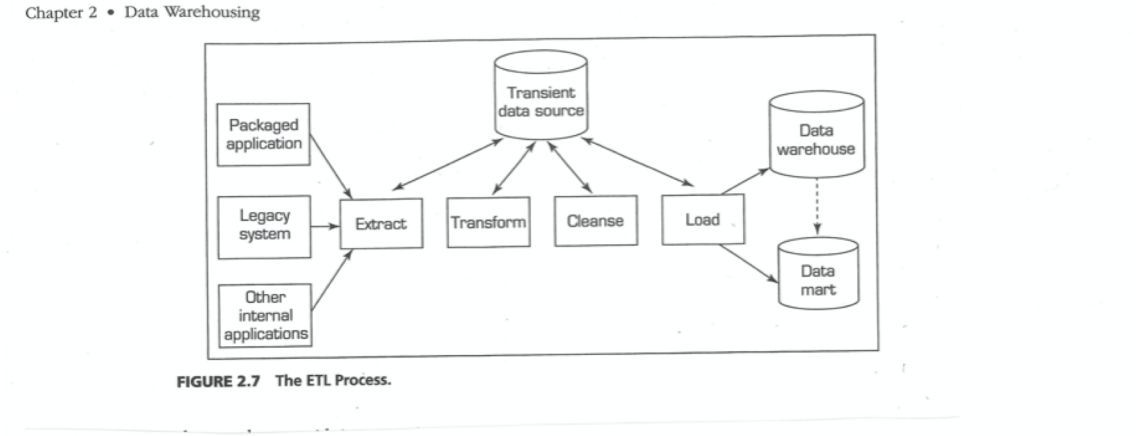


FIGURE 2.7 The ETL Process.

ETL definition

”… describes the typical processes and tools used to support the mapping, merging, and movement of data between databases”

Glossary, Data Science

UPPSALA UNIVERSITET

Data warehouse vs **Data lake**

Figure 1: Typical Distinctions

	Data warehouse	Data lake
Intended users	Business users	Data scientists, experts
Volume stored	Lower	Higher
Type of data	Curated, prestructured	Raw, batch or streaming
Storage cost	Higher	Lower
Analytics tools	BI and online analytical processing tools, semantic layer	Analytical modeling workbenches, sandboxes
Use cases	Ad hoc, dashboards	Exploratory
SLAs	Yes	No
Technologies	RDBMS/columnar, massively parallel processing appliances	Hadoop/Hadoop Distributed File System, blob storage

Source: Deloitte Consulting LLP

UPPSALA UNIVERSITET

Microfoundations

JOURNAL OF MANAGEMENT STUDIES

Journal of Management Studies 49:8 December 2012
doi: 10.1111/j.1467-6486.2012.01052.x

Microfoundations of Routines and Capabilities: Individuals, Processes, and Structure

Teppo Felin, Nicolai J. Foss, Koen H. Heimeriks and Tammy L. Madsen

Brigham Young University; Copenhagen Business School and Norwegian School of Economics; Erasmus University; Santa Clara University

ABSTRACT This article introduces the Special Issue and discusses the microfoundations of routines and capabilities, including why a microfoundations view is needed and how it may inform work on organizational and competitive heterogeneity. Building on extant research, we identify three primary categories of micro-level components underlying routines and capabilities: individuals, social processes, and structure. We discuss how these components, and their interactions, may affect routines and capabilities. In doing so, we outline a research agenda for advancing the field's understanding of the microfoundations of routines and capabilities.

Keywords: aggregation, microfoundations, micro-macro links, routines and capabilities

INTRODUCTION

Routines and Capabilities creates heterogenous organisations and performance

”Micro-level phenomena, specifically, individuals, processes, and structures, played a central role in the origins of management theory”.

Felin, et al. 2012, *Microfoundations and Capabilities: Individuals, Processes, and Structure*, p.1352

UPPSALA UNIVERSITET

Routines – ”Processes”- Work- How?

”It is widely accepted that routines are ‘**repetitive, recognizable patterns of interdependent actions**, carried out by **multiple actors**’ ...

…routines are explicitly **collective rather than individual-level phe**nomena …: the emphasis is placed on the **interactions** rather than the individuals that are interacting.

Routines have **ostensive as well as performative** aspects. The ostensive aspect captures the traditional view of routines as structure or the ‘abstract idea of the routine’ whereas the performative involves the **enactment** of a routine in time and space

The **interaction of the ostensive and performative** aspects of routines informs our understanding of change and collective outcomes ...

Felin et al. p 1355

UPPSALA UNIVERSITET

Building Blocks

”As a starting point, we suggest that the **microfoundations of routines** and capabilities can be clustered into three core or overarching categories:

(1) individuals,
(2) processes and interactions, and
(3) structure.

As noted above, these categories are **embedded in a nested and temporal** (and even causal) **hierarchy**. In addition, while we suggest that each category may have main effects on routines and capabilities, each category does not operate in a vacuum. Instead, they are enmeshed in different **interactions** within an organization (individuals and individuals, individuals and processes, etc.). As a result, interactions within and among categories form a second set of effects that contribute to the collective phenomena of routines and capabilities.

Felin et al. p 1357

1. The Role of Individuals – Social Capital (Relational Capital) & Human Capital.

”For instance, since routines involve patterns of **interdependent actions** carried out by multiple actors, an individual’s ability to engage or interact with other individuals **(relational ability**) or to integrate different elements such as knowledge or artefacts **(integration ability)** may affect the execution and outcome of a routine or capability. Alternatively, **specific skills or abilities** such as creating, forecasting, or sensing, may directly influence the development and modification of routines and capabilities.”

Felin, et al. p 1361

UPPSALA UNIVERSITET

2. Processes and **Interaction**

”… it is hard to tease out the ‘origins’ of routines and capabilities without **reference to the historical and contextual factors** that clearly play a role in the operation of routines and development of capability. **Time-dependent** processes necessarily inform routines and capabilities in two fundamental ways. In the simplest sense, a process is a **sequence of interdependent events**; this baseline definition maps directly to the definition of routines. Second, putting processes into action requires the intervention of individuals. Thus, interactions among individuals and processes within organizations may provide insights into how capabilities and routines emerge.”

Felin, et al p. 1362

Methods of coordination and integration

”The interactions between individuals and processes within a firm shape its routines and capabilities in critical ways. Various studies find that **both formal** (e.g. rules, standard operating procedures) and **informal forms** of coordination (e.g. experience, norms, values) influence sequences of interdependent events or actions. A host of studies have analysed a variety of formal coordination processes both **within and across** organizational boundaries”

Felin, et al, p. 1363

3. Structure: Design of organization

”A vast body of work considers how **differences in the design** of organizational structures may affect routines and capabilities. It is widely recognized that the **degree of complexity** of an organizational structure or form (e.g. tall vs. flat; matrix, virtual matrix, network form) impacts the nature, rate, and diffusion of different activities within an organization, such as information processing, knowledge sharing, routine replication, and capability development. For instance, flat structures **allow for autonomy** and maxi- mize the information held by members of an organization, but also create **problems for effective coordination**. At the same time, an organization’s design might give rise to **gaps in shared knowledge across** parts of the organization and, in turn, compromise coordination and integration.

Felin et al, p 1365

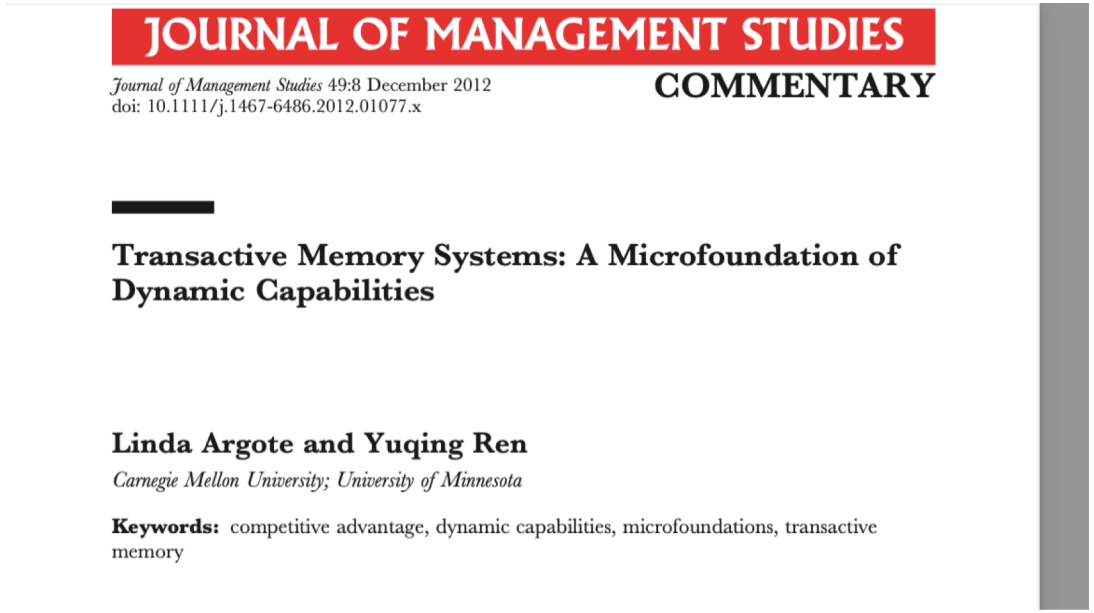
3. Structure: Founder´s logic (c.f Selznick, 1957).

”Last, the resource and environmental conditions present at a firm’s **founding affect its subsequent development**, including its routines and capabilities. More specifically, work finds that a founder’s logic for organizational design has a persistent effect on a start-up’s development. For instance, founders with a **bureaucratic logic** tend to build more rigid administrative structures and processes over time as compared to founders with different organizing logics. These organizing logics also affect a firm’s resource and capability investment policies over time and, in turn, a firm’s rate of development”.

Felin, et al. p 1365

Transactive Memory

Know who and what?



JOURNAL OF MANAGEMENT STUDIES

Journal of Management Studies 49:8 December 2012
doi: 10.1111/j.1467-6486.2012.01077.x

COMMENTARY

Transactive Memory Systems: A Microfoundation of Dynamic Capabilities

Linda Argote and Yuqing Ren
Carnegie Mellon University; University of Minnesota

Keywords: competitive advantage, dynamic capabilities, microfoundations, transactive memory

Definition…

…refers to a shared system that individuals in groups and organizations develop to **collectively encode, store, and retrieve information or knowledge in different domains**. Simply put, transactive memory refers to the knowledge of 'who knows what'.

…the existence of transactive memory to improved performance in a variety of tasks such as consulting, product assembly, and software development

Argote & Ren, 2012, p 1376

UPPSALA UNIVERSITET

Definition

”A transactive memory system refers to a shared system that individuals in groups and organizations develop to **collectively** encode, store, and retrieve information or knowledge in different domains Simply put, transactive memory refers to the knowledge of ‘who knows what’.

…the existence of transactive memory to improved performance in a variety of tasks such as consulting, product assembly, and software development.

Argote & Ren, 2012, p 1376

UPPSALA UNIVERSITET

An early view

”These early contributions emphasize the role of artifacts as **‘external memory’** (Nelson and Winter, 1982); artifacts help humans deal with solving complex problems by sharing some of the cognitive burden. This notion resonates with the later anthropological notion of **distributed cognition** (Hutchins, 1995), pointing to the fact that a routine does not reside in any one place, and certainly not solely in the human mind, but is instead distributed *across* people and artifacts, including rules and technologies.”

P 202

UPPSALA UNIVERSITET

Individual & Group

Researchers have identified three indicators of the existence of transactive memory systems: **knowledge or memory specialization** (the tendency for group members to remember different aspects of a task or to develop specialized and complementary expertise**), task credibility** (how much group members trust each other's knowledge), and **task coordination** (the ability of group members to work together smoothly and efficiently while performing a task). This meta knowledge of who knows what provides individuals with access to more knowledge than they individually possess.

UPPSALA UNIVERSITET

Why and how a capability?

”Three characteristics of an organizational transactive memory system make it a valuable source for sustainable competitive advantage”:

- path dependency
- tacitness and social complexity
- context dependency.

UPPSALA UNIVERSITET

Artifacts

Journal of Institutional Economics (2011), 7: 2, 197–230
© The JOIE Foundation 2010 doi:10.1017/S174413741000024X
First published online 16 July 2010

Artifacts at the centre of routines: performing the material turn in routines theory

LUCIANA D'ADDERIO
The University of Edinburgh (UK) and the Advanced Institute of Management (AIM) Research

Abstract: Existing theories of organizational routines have generally had simplistic and extreme views of artifacts as fully deterministic or largely inconsequential. Artifacts have been treated as either too solid to be avoided, or too flexible to have an effect. This paper endeavours to improve our understanding of the influence of artifacts on routines dynamics by proposing a novel and deeper conceptualization of their mutual relationship. In drawing from recent advances in Routines and STS/Performativity Theory, the paper contributes to advancing our understanding of routines dynamics by bringing artifacts and materiality from the periphery to the very centre of routines and Routines Theory.

Deterministic or Voluntaristic?

”This entails moving beyond the dominant characterization of artifacts as opaque, lifeless ‘objects’ that lie *outside* the routine. It also involves moving past their extreme characterization as either **fully prescriptive** objects that **deterministically influence** and constrain actions, or as simply descriptive, infinitely malleable and often inconsequential entities, which depend upon the agents’ willingness to include them as part of their performances.

D Adderio, 2010, p 199

UPPSALA UNIVERSITET

Distributed Cognition

”The notion of distributed cognition is not entirely new to Organizational Theory. According to Simon (1969) and Arthur (1994), agents faced with complicated tasks conceive of tools, create rules and routines or set up organizations to relieve their brains and enhance their performance. In so doing, these authors have extended the actors’ cognitive capacities by ‘redistributing their brains, *at least implicitly*’. In early Routines Theory, analogously, the notion of distributed knowledge has provided ‘the natural locus of attention for lines of research focused on the role of artifacts’”.

UPPSALA UNIVERSITET

ANT view

”According to the *ANT view*, neither realists nor constructivists are able to account for the complex interactions between people and things. Realists underestimate the power of humans when faced with the intrinsic influence of certain technologies, while constructivists underestimate the power of objects. According to ANT scholars (Callon, 1987; Latour, 1987), the properties of artifacts neither are objective facts, as in the realist tradition, nor are they mere social constructions, as in the social constructivist tradition: artifacts and their properties are *both* real and constructed. They emerge from a heterogeneous network of social *and* technical elements (including *social* representations and *natural* forces/*technical* elements) that co-construct them.

P 200

UPPSALA UNIVERSITET

Interactions routines and artifacts

”A focus on artifactual representations, I posit, will allow us to make progress by revealing the **complex dynamics of interactions between routines and artifacts**. Dynamics include the relationships between artifacts and the ostensive, and artifacts and performances; as well as between artifactual ‘representations’ of routines and actual ‘expressions’.”

UPPSALA UNIVERSITET

Human Trust in AI

© *Academy of Management Annals*
2020, Vol. 14, No. 2, 627–660.
https://doi.org/10.5465/annals.2018.0057

HUMAN TRUST IN ARTIFICIAL INTELLIGENCE: REVIEW OF EMPIRICAL RESEARCH

ELLA GLIKSON[1]
Bar Ilan University

ANITA WILLIAMS WOOLLEY
Carnegie Mellon University

Artificial intelligence (AI) characterizes a new generation of technologies capable of interacting with the environment and aiming to simulate human intelligence. The success of integrating AI into organizations critically depends on workers' trust in AI technology. This review explains how AI differs from other technologies and presents the existing empirical research on the determinants of human "trust" in AI, conducted in multiple disciplines over the last 20 years. Based on the reviewed literature, we identify the form of AI representation (robot, virtual, and embedded) and its level of machine intelligence (i.e., its capabilities) as important antecedents to the development of trust and propose a framework that addresses the elements that shape users' cognitive and emotional trust. Our review reveals the important role of AI's tangibility, transparency, reliability, and immediacy behaviors in developing cognitive trust, and the role of AI's anthropomorphism specifically for emotional trust. We also note several limitations in the current evidence base, such as the diversity of trust measures and overreliance on short-term, small sample, and experimental studies, where the development of trust is likely to be different than in longer-term, higher stakes field environments. Based on our review, we suggest the most promising paths for future research.

Trust (vs Control)

”One of the most cited definitions of trust was suggested by Mayer, Davis, and Schoorman (1995), who argued that trust is “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, Davis, & Schoorman, 1995, p. 712).”

Glikson & Woolley, 2020, p 630.

UPPSALA UNIVERSITET

Cognition & Emotions

”Much of the extant organizational research has considered trust to be a **cognitive construct** that involves rational evaluation of the trustee and situational features However, trust might also be **influenced by irrational factors, such as emotions and mood.** McAllister (1995) referred to the latter as emotion-driven or affect-based trust, suggesting that in interpersonal relationships, people develop social connections that provide support and comfort—in addition to cognitive trust that is based on perceptions of trustee reliance and competence.”

Glikson & Woolley, 2020, p 630.

UPPSALA UNIVERSITET

Cognitive Trust in AI

TABLE 1
Main Effects of Dimensions on Cognitive Trust in AI, Organized by Representation

Dimensions	Robotic AI	Virtual AI	Embedded AI
Tangibility	Physical presence increases trust: More trust in robotic AI than in virtual AI.	Visual presence increases trust: More trust in virtual AI than in embedded AI.	The effect of awareness on the use of AI is not clear.
Selected references	Bainbridge et al. (2011), Lee, Peng, Jin, & Yan (2006), Salem et al. (2015), Shinozawa et al. (2005)	Chattaraman et al. (2014), Mumm & Mutlu (2011)	Eslami et al. (2015)
Transparency	Transparency might increase trust, but the empirical research is scant.	Transparency of AI reliability and explanations of how algorithm works increase trust.	Transparency of how algorithm works increases trust; especially needed for highly intelligent managerial systems.
Selected references	Sanders et al. (2014)	Fan et al. (2008), Wang & Benbasat (2007), Wang et al. (2016)	Alan et al. (2014), Chao et al. (2016), Dietvorst et al. (2016), Dzindolet et al. (2003), Kizilcec (2016), Lee, Kusbit, Metsky, & Dabbish (2015), Möhlmann & Zalmanson (2017)
Reliability	Low reliability decreases trust, but not always: When robot is perceived as having high machine intelligence, people tend to follow even a faulty robot.	Low reliability mostly decreases trust in laboratory and field studies where the initial trust was very high.	Low reliability significantly decreases trust, and the way to restore trust is difficult and takes time.
Selected references	Bainbridge et al. (2011), Desai et al. (2012), Freedy et al. (2007), Robinette et al. (2016), Salem et al. (2015)	Fan et al. (2008); Glass et al. (2008); Moran et al. (2013)	Dietvorst et al. (2015); Dzindolet et al. (2003); Manzey et al. (2012)
Task characteristics	In technical tasks the trust is higher than in tasks that require social intelligence.	In technical tasks that require data analysis, trust in AI is higher than in humans.	In tasks that require social intelligence, the trust in humans is higher than in AI; high self-confidence moderates the trust in AI.
Selected references	Gaudiello et al. (2016), Gombolay et al. (2015)	Ramchurn et al. (2016)	Dietvorst et al. (2016), Logg et al. (2018)
Immediacy behaviors	Responsiveness, adaptiveness, and pro-social behaviors increase trust.	Personalization and use of persuasion tactics increase trust.	Personalization improves trust; constant tracking of workers' behaviors may decrease trust.
Selected references	Baraglia et al. (2016), De Visser & Parasuraman (2011), Hoffman & Breazeal (2007), Oistad et al. (2016)	Andrews (2012), Fenster et al. (2012), Komiak & Benbasat (2006)	Dzindolet et al. (2003), Lee et al. (2015), Matz et al. (2017), Möhlmann & Zalmanson (2017)

High machine intelligence that allows the tech- **Cognitive Trust in Robotic AI**

UPPSALA UNIVERSITET

Emotional Trust in AI

TABLE 2
Main Effects of Dimensions on Emotional Trust in AI, Organized by Representation

Dimensions	Robotic AI	Virtual AI	Embedded AI
Tangibility	Physical presence may not only increase liking but also induce fear.	Presence of a "persona" increases liking and emotional trust.	Being unaware of AI use may evoke anger. Positive emotions could be driven by good reputation of a developing firm.
Selected references	Obaid et al. (2016b), Shim & Arkin (2014)	Chattaraman et al. (2014), de Visser et al. (2017), Pak et al. (2012), Qiu & Benbasat (2009)	Eslami et al. (2015), Hengstler et al. (2016)
Anthropomorphism	Human-likeness mostly increases positive emotions, but can also cause discomfort.	Mostly increases trust, but also creates high expectations regarding AI's abilities. Attractiveness and personalization, such as ethnicity or facial similarity to the user, increase trust.	
Selected references	Appel et al. (2016), Jacq et al. (2016), Zhang et al. (2010), Złotowski et al. (2016)	Khan & Sutcliffe (2014), Obaid et al. (2016a), Verberne et al. (2015), Von Der Pütten et al. (2010)	
Immediacy behaviors	Human-like behaviors induce high emotional trust; erroneous robots are liked more than flawless ones.	Human-like behaviors increase trust and liking, yet the effect depends on users' predispositions.	
Selected references	Bickmore et al. (2013), Birnbaum et al. (2016), Jung et al. (2013), Mirnig et al. (2017), Sandoval et al. (2016)	Ben Mimoun et al. (2017), Dabholkar & Sheng (2012), Kaptein et al. (2011), Matsui & Yamada (2019)	

UPPSALA UNIVERSITET

Affordance

Information and Organization 24 (2014) 236–249

Contents lists available at ScienceDirect

Information and Organization

journal homepage: www.elsevier.com/locate/infoandorg

Affordances for practice

Anne-Laure Fayard [a,*], John Weeks [b]

[a] Polytechnic School of Engineering, New York University, Brooklyn, NY, USA
[b] IMD, Lausanne, Switzerland

ARTICLE INFO

Article history:
Received 25 April 2011
Received in revised form 4 September 2014
Accepted 7 October 2014
Available online xxxx

Keywords:
Affordance
Sociomateriality
Integrative interpretation
Practice
Habitus

ABSTRACT

This paper argues that Gibson's concept of affordance inserts a powerful conceptual lens for the study of sociomateriality as enacted in contemporary organizational practices. Our objective in this paper is to develop a comprehensive view of affordances that builds upon the existing conceptualizations in the psychology, human–computer interaction, sociology and information systems literatures and extend them in three important ways. First, we show that taking an integrative interpretation of affordance as dispositional and relational, rather than the standard unidimensional interpretation, provides a theoretical articulation of how the material and the social influence each other. Second, we propose to broaden the focus from the affordances *of* technology to the affordances *for* practice provided jointly by technology and organizing. This means considering social affordances alongside technological affordances. Finally, we argue that the best way to integrate the study of social and technological affordances is not to stretch Gibson's original concept to include the social but rather to complement it with a sociological concept that fits it neatly: Bourdieu's idea of habitus. Our claim is that the concepts of affordance and habitus complement and complete each other. Affordance offers a useful way of thinking about how practice is patterned by the social and physical construction of technology and the material environment and habitus offers a useful way of thinking about how practice is patterned by social and symbolic structures. We describe how affordances and habitus may be used together to provide a theoretical apparatus to study practice as a sociomaterial entanglement, thus adding to the methodological toolkit of scholars embracing a sociomaterial perspectives.