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Discussion – articles April 6

Jan Lindvall

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Management models

Johnson Cornell SC Johnson College of Business

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The Evolution of Management Models: A Neo-Schumpeterian Theory

Zlatko Bodrožić[1] and Paul S. Adler[2]

Abstract
In the last century and a half, U.S. industry has seen the emergence of several different management models. We propose a theory of this evolution based on three nested and interacting processes. First, we identify several successive waves of technological revolution, each of which prompted a corresponding wave of change in the dominant organizational paradigm. Second, nested within these waves, each of these organizational paradigms emerged through two successive cycles—a primary cycle that generated a new management model making the prior organizational paradigm obsolete, and a secondary cycle that generated another model that mitigated the dysfunctions of the primary cycle's model. Third, nested within each cycle is a problem-solving process in which each model's development passed through four main phases: (1) identification of a widespread organizational and management problem, (2) creation of innovative managerial concepts that offer various solutions to this problem, (3) emergence and theorization of a new model from among these concepts, and (4) dissemination and diffusion of this model. By linking new models' emergence to specific technological revolutions, we can explain changes in their contents. By integrating a dialectical account of the paired cycles with an account of the waves of paradigm change, we can see how apparently competing models are better understood as complementary pairs in a common paradigm. And by unpacking each model's phases of development, we can identify the roles played by various actors and management concepts in driving change in the models' contents and see the agency behind these structural changes.

Keywords: management model, organizational paradigm, technological revolution, neo-Schumpeterian

Even in more-advanced industrial economies, it was less than two centuries ago that the internal organization of business enterprises, until then essentially

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Technological **Revolutions**

Table 1. Timeline of Technological Revolutions (adapting Perez, 2002)

Technological revolution	Examples of dominant U.S. companies (and year founded)
1st wave: Water power and iron	
Incubation: 1750s–1770	
Installation: 1771–1793	
Crisis/turning point: 1793–1797	
Deployment: 1797–1829	
Exhaustion: 1830–1840s	
2nd wave: Steam power and railways	
Incubation: 1790s–1829s	Baltimore & Ohio Railroad (1827)
Installation: 1829–1848	Erie Railroad (1832)
Crisis/turning point: 1848–1850	Pennsylvania Railroad (1846)
Deployment: 1850–1873	
Exhaustion: 1873–1890s	
3rd wave: Steel and electric power	
Incubation: 1850s–1875	Bethlehem Steel (1857)
Installation: 1875–1893	Midvale Steel (1867)
Crisis/turning point: 1893–1895	Carnegie Steel (1872) (part of U.S. Steel as of 1901)
Deployment: 1895–1918	
Exhaustion: 1918–1940s	
4th wave: Automobile and oil	
Incubation: 1880s–1908	Ford (1903)
Installation: 1908–1929	General Motors (1908)
Crisis/turning point: 1929–1944	Chrysler (1925) (predecessor Maxwell founded 1904)
Deployment: 1944–1974	
Exhaustion: 1974–1980s	
5th wave: Computers and telecommunication	
Incubation: 1950s–1971	IBM (1911)
Installation: 1971–2001	Hewlett Packard (1939)
Crisis/turning point: 2001/2008	Microsoft (1975)
Deployment: ?	Apple (1976)
Exhaustion: ?	Google (1998)

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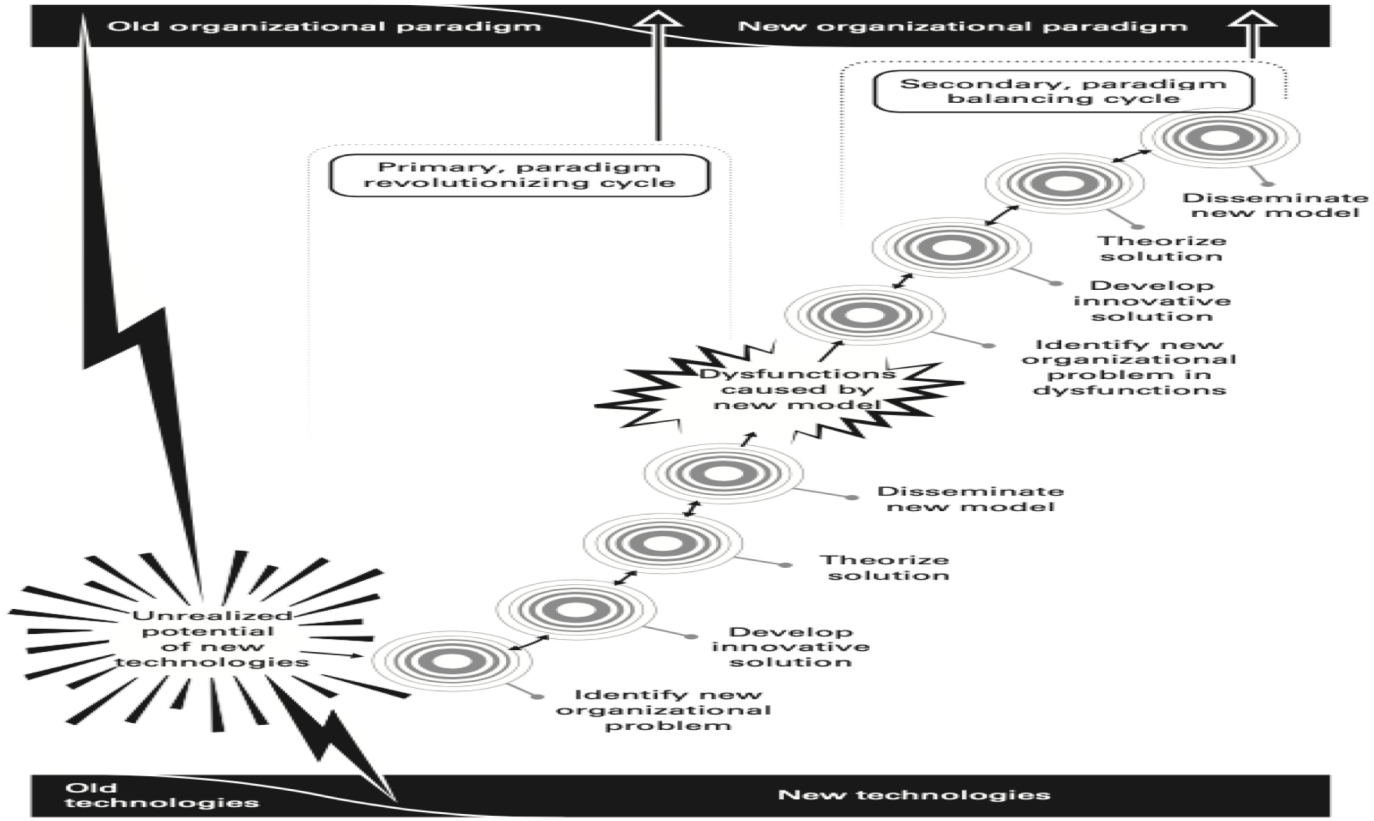
Bodrozic & Adler: Management Model. The Developed Model

Figure 1. Primary and secondary cycles.



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Organisation(”SOCIO”): The Legacy – Old? **Mindset**

Automobile and oil	Corporation: The multi-divisional mass-production corporation with strategic integration but operating autonomy in the divisions	Revolutionizing cycle: Strategy-and-structure Differentiating internal structure and strategy so as to support the production, marketing, and sales of differentiated products to different types of customers	Profit center† Operations research Corporate strategt Multidivisional Matrix structure† Divisionalization Management by objective	1955 1956 1965 1965 1969 1971 1972
		Balancing cycle: Quality management Deploying a management system to involve personnel at all levels in continuously improving product and process quality	Job enrichment Quality circle† Corporate culture† Organizational learning Total quality management Continuous improvement Lean production	1972 1979 1980 1981 1986 1988 1992

(continued)

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The ”New” Mindset?

Technology revolution	Organizational paradigm	Dominant management model and key elements	Management concept search terms	Emergence*
Computers and telecommunication	Network: Linking and rationalizing processes across internal and external boundaries	Revolutionizing cycle: Business process Redesign of business processes up and down the value chain, redrawing and bridging internal and external boundaries	Business process redesign	1991
			Outsourcing	1991
			Horizontal organization†	1991
			Process improvement	1991
			Business process reengineering	1992
			Core competencies	1993
			Business model†	1994
			Interfirm network†	1995
			Supply-chain management	1996
		Balancing cycle: Knowledge management The cultivation of communities of practice in order to regain, retain, or improve the innovation capacity of dispersed employees.	Knowledge management	1996
			Intellectual capital	1997
			Knowledge repositor†	1998
			Communit† of practice	1998
			Agile (“NEAR/5 software”)	1998
			Scrum (“NEAR/5 software”)	2005

* Emergence date represents the year in which the frequency of the concept’s use first accelerates, based on a search of ABI/INFORM complete, Hoover’s Company Profiles, ProQuest Historical Annual Reports, American Periodicals, and ProQuest Historical Newspapers collection.
† Denotes wildcard in management concept search term.

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Cognition & Capabilities

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ACADEMY OF Management

Cognition and Capabilities:
A Multi-Level Perspective

J. P. EGGERS*
Stern School of Business, New York University

SARAH KAPLAN
Rotman School of Management, University of Toronto

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Managerial cognition is important!

”Recognizing that strategies for the **deployment of capabilities** are conceived of and implemented by managers, researchers have begun to devote more attention to the **cognition of managers and the interpretive processes in which they engage** (Benner & Tripsas, 2012; Eggers & Kaplan, 2009; Gavetti, 2005; Kunc & Morecroft, 2010).

Their initial insights suggest that managerial cognition plays a central role in **capability development and deployment**”.

Two Streams of research…

- ”*The capabilities approach* (and the resource-based view) problematized the organization by showing that **heterogeneous capability** endowments across organizations could lead to **differential performance** even in the same environment (Barney, 1991; Henderson & Clark, 1990; Henderson & Cockburn, 1994; Nelson & Winter, 1982; Prahalad & Hamel, 1990; Wernerfelt, 1984).

- *Managerial cognition* scholars problematized the environment by suggesting that it **is not purely exogenous**; instead, managerial interpretations of the environment shape how organizations respond to it” (Barr, Stimpert, & Huff, 1992; Daft & Weick, 1984; Lant, Milliken, & Batra, 1992; Ocasio, 1997; Porac, Thomas, & Baden-Fuller, 1989; Reger & Palmer, 1996).

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”The Standard Model”

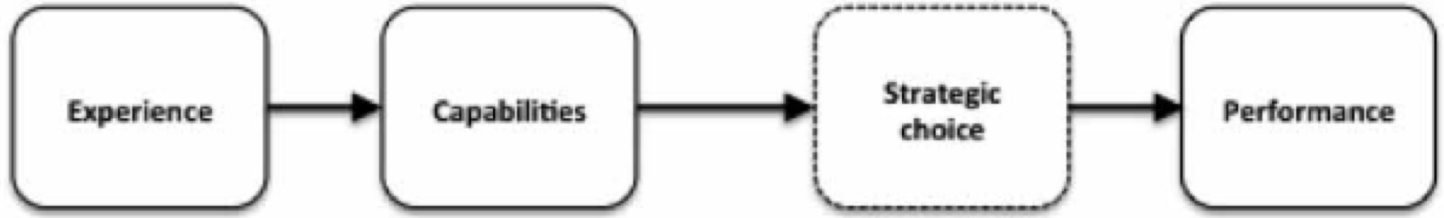

Figure 1 Capabilities and Performance—The Standard Model.

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A Linear Model

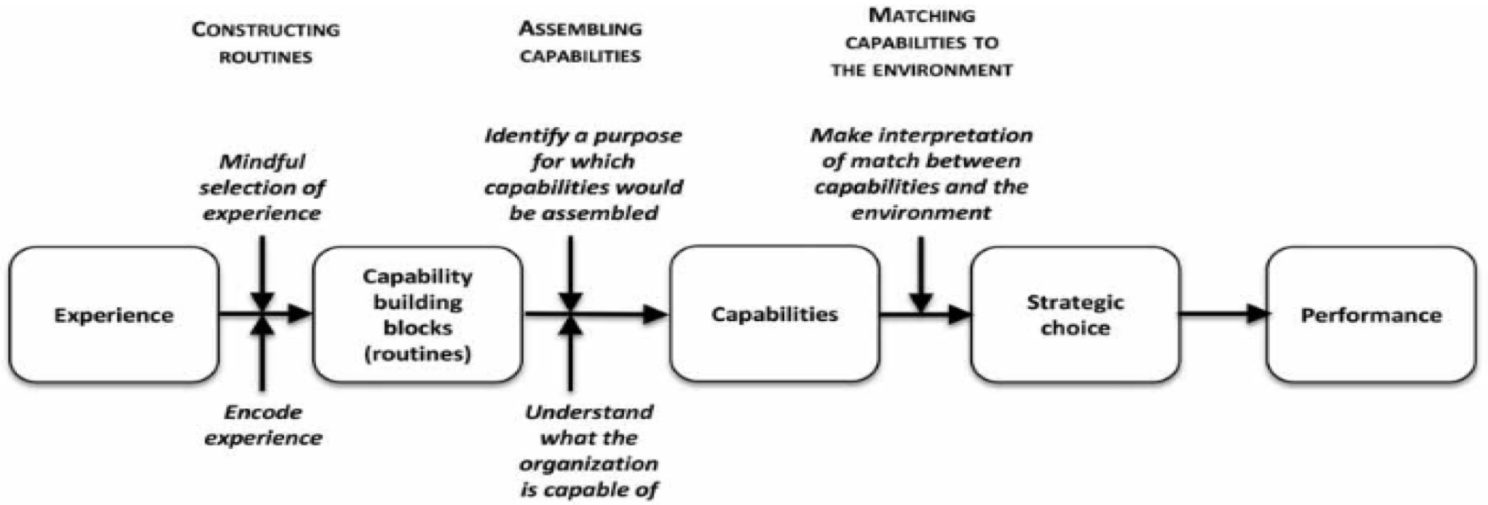

Figure 2 Cognition and Capabilities—A Linear Model.

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The Developed Model Recursive Model

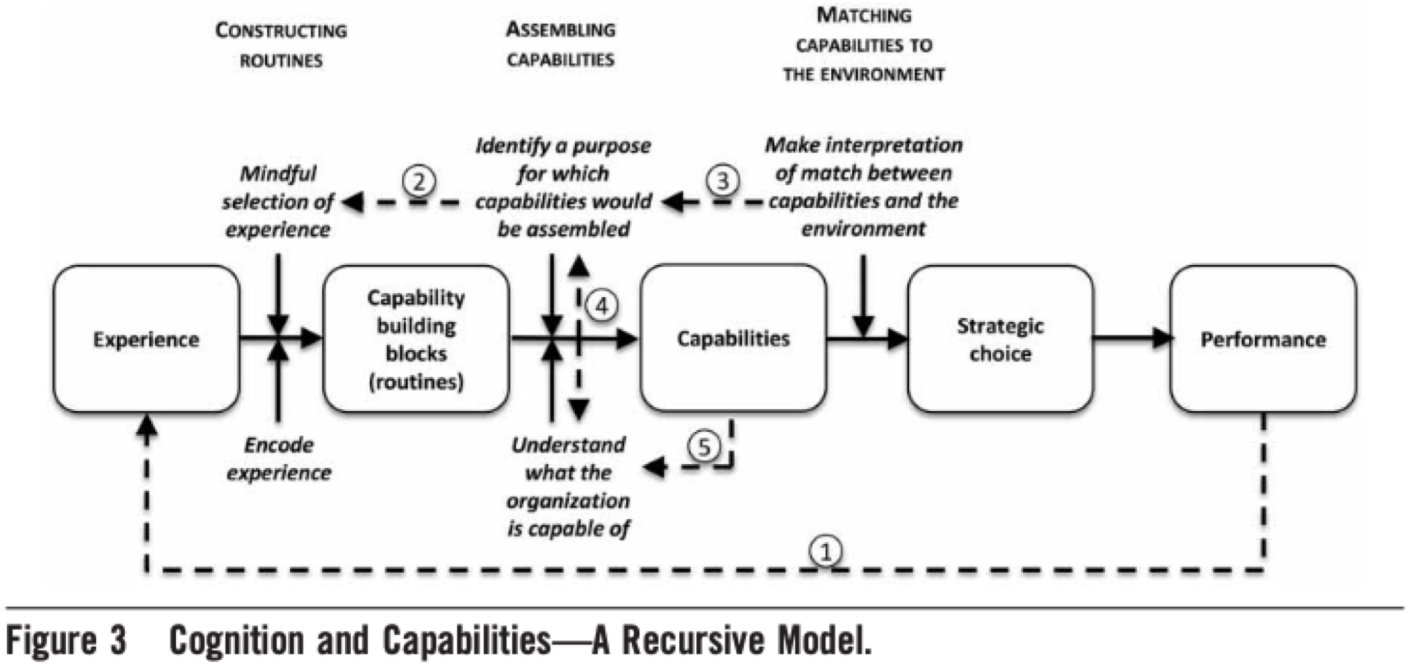

Figure 3 Cognition and Capabilities—A Recursive Model.

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Information (Data, Information, Knowledge, Wisdom).

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Information: Fundamental positions and their implications for information systems research, education and practice

Sebastian K. Boell *

The University of Sydney Business School, Discipline of Business Information Systems, Abercrombie Building H70, Room 4063, Sydney, New South Wales 2006, Australia

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ABSTRACT

Information is an important concept for the "information age", the "information society" and the discipline of Information Systems (IS). However, different conceptions of information often make incommensurable assumptions about what information is. This essay introduces a 'consequential framework' revealing different assumptions made about the nature of information and the consequences following from these assumptions. According to this consequential framework four stances on the existence of information can be distinguished: (1) A first stance assumes information to exist independently of humans as part of the physical world, for instance, in the structure of the universe or the transmission of signals; (2) a second stance assumes that information exists in signs but in a observer independent way, such as in objective facts about things; (3) a third stance assumes that information exists only in relation to a subject, so that the same document, report or data will convey different information to different individuals; (4) a fourth stance assumes information to exist within a sociocultural setting, as lawyers, doctors or accountants differ in what is information to them. Each of these four stances makes vastly different assumptions about how information can be accessed and used by humans. This has further consequences for how information can be researched and how related concepts, such as data, signs, technology, or social context can be related to the study of information. The consequential framework introduced offers conceptual clarity regarding a central but largely ignored concept for IS and its reference disciplines.

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Boell: The Basic Model

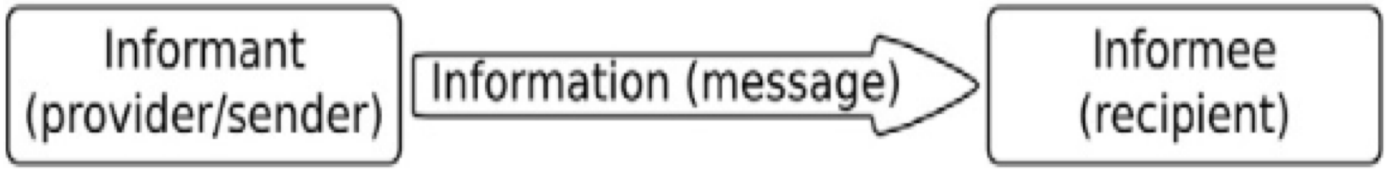

Fig. 1. Information, information, informee.

Shannon´s (**mathematical th**eory of information) model: **Syntax!**

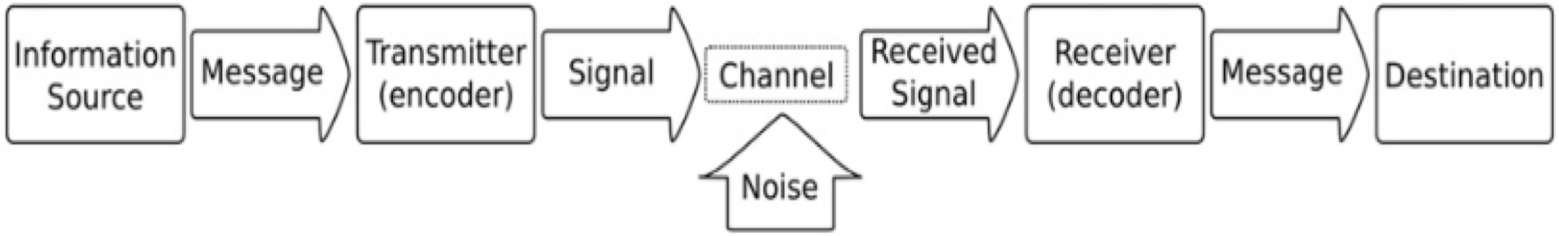

Fig. 2. Shannon's model of communication.

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Boell: Different views of information: Syntax, Semantics, **Pragmatic**

Table 5
Comparison of Differences among the Four Stances on Information.

Depiction of information regarding	Physical stance	Objective stance	Subject-centered stance	Sociocultural stance
Existence of information in the world	Information exists independently of a human observer as part of the physical world.	Information exists independently of an observer in the sense of true facts or physical inscriptions of knowledge.	Information exists as cognitive process resulting from an observation and often in regards to a purpose.	Information exists as shared sociocultural understanding of the importance of differences.
Condition for existence	'Raw' information is acquired from the world or specified in regards to objective physical units.	Information needs to be an accurate representation of reality.	Information needs to be meaningful and relevant to a human being.	Information needs inter-subjective agreement about meaningful difference within a specific context.
Data	Data are the result of recording 'raw' information.	Data and information are often not clearly differentiable.	Data are the input from which information is generated.	Data are physical inscriptions created on the basis of a particular social, cultural and technical understanding.
Knowledge	Is not considered.	Information is atomic 'nuggets' of knowledge or physical inscriptions of knowledge.	Is created or altered as a consequence of information.	Is created through sociocultural interaction with the world and shapes how information can emerge.
Signs	Are not considered.	Are the carrier of (contain) information in an objective sense.	Are interpreted into information.	Evolve as result of inter-subjective agreement and affect what can constitute information.
Human beings	Are not considered.	Create meaning from information.	Are appropriators of information.	Are creators or interpreters of information within a sociocultural context.
Social context	Is not considered.	Is not considered.	May be present as a background.	Is considered an important aspect of information.
Technology	Captures, encodes or decodes information.	Captures, stores, process' and transmits information.	Providing input that may become information for a subject.	Are devices that can provide meaningful outputs on the basis of a shared practice.
Relevance to IS research	Research interested in the development of IT.	Research interested in the design and modeling of IS.	Research interested in behavioral and cognitive aspects of IS.	Research interested in socio-technical and sociomaterial aspects of IS.

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Social Construction

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What's Under Construction Here?
Social Action, Materiality, and Power in Constructivist Studies of Technology and Organizing

PAUL M. LEONARDI*
Department of Communication Studies, Department of Industrial Engineering and Management Sciences, Northwestern University

STEPHEN R. BARLEY
Department of Management Science and Engineering, Stanford University

Abstract

Over the past two decades, organizational scholars have increasingly argued that technology's affects on organizations are socially constructed. Constructivists who study implementation generally hold that organizational change emerges from an ongoing stream of social action in which people respond to a technology's constraints and affordances, as well as to each other. Although most students of technology and organizing generally agree on the ontology of constructivism, there are considerable differences in what scholars mean when they say that a technology's affects are socially constructed. We show that research on the social construction of implementation clusters into five coherent perspectives, which we call *perception*, *interpretation*, *appropriation*,

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Perspectives on **Social Construction of Technology**

Table 1 Summary of Perspectives on the Social Construction of Technology Implementation

	Perception	Interpretation	Appropriation	Enactment	Alignment
Phase of implementation	Adoption	Use	Use	Use	Adaptation
The social phenomenon constructed	Attitudes, beliefs, and values	Schemas and frames	Patterns of deviation and conformity	Work practices	Roles and relationships
Construction process	Social influence	Transference	Intra-group interaction	Situated improvisations	Inter-group interaction
Examples	Fulk, Steinfield, Schmitz, and Power (1987) Fulk et al. (1990) Fulk and Boyd (1991) Rice and Aydin (1991) Schmitz and Fulk (1991) Fulk (1993) Fulk, Schmitz, and Ryu (1995)	Barley (1988) Prasad (1993) Markus (1994) Prasad and Prasad (1994) Orlikowski and Gash (1994) Walsham and Sahay (1999)	Watson, DeSanctis, and Poole (1988) Poole and DeSanctis (1990) Orlikowski and Robey (1991) Orlikowski (1992)	Yates and Orlikowski (1992) Orlikowski and Yates (1994) Orlikowski, Yates, Okamura, and Fujimoto (1995) Boczkowski (1999) Yates, Orlikowski, and Okamura (1999) Orlikowski (2000)	Barley (1986) Zuboff (1988) Barley (1990) Zack and McKenney (1995) Orlikowski (1996) Robey and Sahay (1996) Majchrzak, Rice, Malhotra, King, and Ba (2000)

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Perception

”The perception perspective consists of studies that examine how exposure to others’ attitudes through membership in a group or communication network shapes peoples’ perceptions of a new technology. **Researchers use “perception” as a cover term for attitudes, beliefs, and values.** They are interested in how members of an organization come to **share common perceptions of a technology and how those perceptions determine whether people will or will not use the technology.** Members of this camp have typically used large-scale surveys to study either information or communication technologies.”

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Interpretation

”The interpretation perspective **focuses on use rather than adoption**. Proponents hold that **how people interpret a technology** strongly affects the way they will use it. Although most students of social construction would agree that interpretations are important, scholars in this camp make the substance of **shared interpretations** an explicit object of study, which they normally pursue through field studies of a technology’s use. They also claim that people make sense of new technologies by **drawing on frames imported from other domains, such as technologies they may have worked with in the past,** the subculture of their occupation, or their organization’s culture. In other words, social construction involves the **transfer or modification of a previously existing cognitive framework t**o a new situation”.

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Appropriation

”Like the interpretation perspective, the appropriation perspective attends to **technologies after people have decided to adopt them**. But rather than ask how people make sense of a technology, appropriation researchers **investigate whether people use the technology as its designers or adopters intended.** In fact, the appropriation perspective is the only constructivist approach that recognizes that those who design technologies have images of how the technology will or should be used. Because adherents look to these intentions to establish a point of comparison, they use the term “appropriation” to signal that people are free to use a technology’s features in anticipated or unanticipated ways. Social construction occurs as the members of a group interact around a new technology to produce patterns of deviation from and conformity to an expected mode of use.”

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Enactment

”The enactment perspective is tightly associated with the work of Wanda Orlikowski, JoAnne Yates, and their colleagues (Orlikowski, 2000; Orlikowski & Yates, 1994; Orlikowski, Yates, Okamura, & Fujimoto, 1995; Yates & Orlikowski, 1992; Yates, Orlikowski, & Okamura, 1999). Through the 1990s, Orlikowski and Yates gradually developed the enactment perspective, which Orlikowski (2000) then systematically articulated in her paper, “Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations.”

”Karl Weick (1979) is usually credited with **introducing the verb “enact”** into organization studies as a way of underscoring the idea that organizing is an activity and that humans wittingly and unwittingly craft organizations as they try to make **sense of and respond to their environments**. “Enact” first entered the constructivist literature on technology through Barley’s (1986, 1988, 1990) studies of computerized imaging in radiology departments.

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Alignment

”Whereas students of enactment ask how and why people employ specific technologies in particular ways, **alignment researchers ask how previously existing institutions shape a technology’s use and how the use of a technology might alter or confirm an existing social order**. In general, the institutions of concern in most alignment research are more **macro-social** than those examined by students of enactment. They range from employment relations (Zuboff, 1988) or the culture and authority structure of an occupation (Barley, 1986, 1990; Edmondson, Bohmer, & Pisano, 2001) to the balance of power in a market (Schultze & Orlikowski, 2004) or the structure of a work system (Black, Carlile, & Repenning, 2004; Davidson & Chismar, 2007; Robey & Sahay, 1996). Alignment, therefore, refers to the **process by which social orders and technologies configure or adjust to each other through emergent patterns of use.** In this sense, the alignment perspective harkens back to the intellectual agenda of socio-technical-systems theory

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How to do it/research?

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Beyond design and use: How scholars should study intelligent technologies

Diane E. Bailey[a,*], Stephen R. Barley[b]

[a] Department of Communication, 484 Mann Library Bldg., College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853, United States
[b] Technology Management Program, College of Engineering, 1320 Phelps Hall, University of California Santa Barbara, Santa Barbara, CA 93106-5129, United States

ABSTRACT

This paper proposes a unified approach to studying intelligent technologies such as artificial intelligence (AI) that extends current studies of design and use. Current discussion of the implication of AI and the future of work gloss four important issues: variation, power, ideology, and institutions. By a unified approach we mean a research agenda that coordinates studies of variation in use with research on power, ideology, design, and institutional change, all focused on a specific technology or set of technologies. The approach rests on the image of a technology timeline that begins with the issues of power and ideology that underwrite the promotion of intelligent technologies by firms and other stakeholders that have an interest in building and diffusing such technologies. Moving to the right the timeline encompasses studies of design, implementation, and use that pay attention to variation in how intelligent technologies occasion changes in work and employment. Finally, the unified approach extends beyond current workplace studies to consider the institutional changes that may arise as the result of how intelligent technologies are used and employs such considerations to shape the agenda of promoters and designers so that they will create technologies that better benefit society.

1. Introduction

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Four issues

- Obscuring **variation** – due to abstraction!
- Overlooking the importance of **power**
- Ignoring **ideology**
- **Institutions** affected by adoption of intelligent technologies

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The model/method

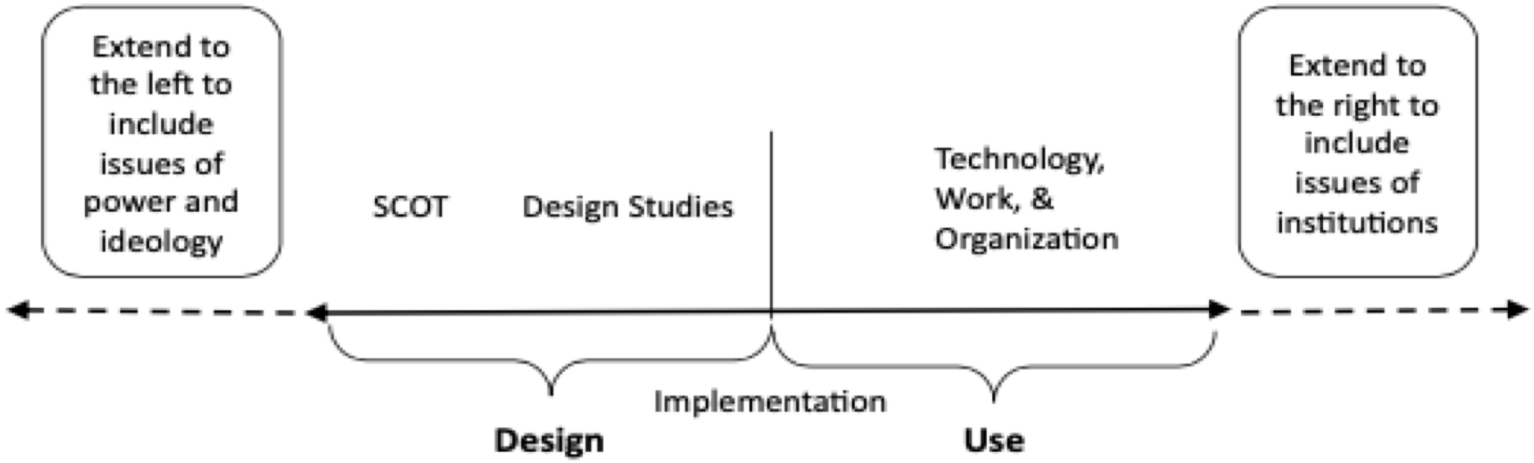

Fig. 1. Current and extended timeline of a technology's trajectory.