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

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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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1. Introduction

Academic fields require shared agreement about concepts that are central to their research as they provide the "theoretical glue" that helps different branches of a field to relate to each other and form a coherent whole (Whetten, 1989). One central concept that is of apparent importance to Information Systems (IS) is the concept of information. However, to date, engagement with information at a theoretical and conceptual level in IS is limited (Baskerville, 2010; Lee, 2004, 2010). This is despite repeated calls by IS researchers over the last four decades to engage more thoroughly with information as a concept (e.g. Boland, 1987; Checkland & Holwell, 1998; Galliers, 1987; Lee, 2004, 2010; Mingers, 1995; Stamper, 1973).

In order to overcome the lack of thorough conceptual engagement with information, IS researchers require greater conceptual clarity as to the range of existing conceptions of information, how conceptions differ from each other in their assumptions about what information is, and subsequently what conceptions are useful for different research purposes. This is important as

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conceptions of information are grounded in diverse fundamental assumptions about how information exists and is accessible by humans. Proper engagement with existing conceptions of information is thus essential for developing conceptual clarity (Lee, 2010). Moreover, understanding how conceptions differ is necessary for identifying approaches to information that are appropriate and promising for advancing engagement with different IS research problems.

This essay addresses the need of IS scholars to more effectively deploy information as a key concept in their research. The aims of this essay are thus: (1) to assist IS scholars in orienting themselves within the existing body of literature that engages conceptually with information within IS and its reference disciplines; and more importantly, (2) to reveal how conceptions of information differ in their assumptions as to how information exists and thus becomes accessible and approachable for IS research, practice, and education. By providing a structured framework of the range of existing conceptions of information this essay empowers IS researchers to develop greater conceptual clarity as to what information is and how it can be used productively as a concept for IS research. Instead of defining one 'correct' or 'best' conception for understanding information the framework introduced here equips IS researchers with meta understanding of the information concept in order to support them in the development of new and diverse conceptions to information for IS.

A prerequisite for IS to advance its conceptual engagement with information is therefore organized awareness of the wealth of existing conceptions of information. However, the body of literature in IS reference disciplines engaging with information at a conceptual and theoretical level is immense (Bates, 2010; Zaliwski, 2011) and currently no structured overview exists that can assist IS researchers in understanding the complete range of existing conceptions of information and how they are different from each other. Published surveys of information, within IS, are scant and only provide limited coverage of the range of currently existing conceptions to information. Mingers' (1996) review focuses on the relationship between information and meaning, and McKinney and Yoos (2010) taxonomy is limited in its coverage, as it is an application of their own conception of information rather than something that is grounded in the literature on information.

To support IS researchers in engaging with information in their own research this essay does three things: Firstly, through an extensive survey of existing conceptions of information taken-for-granted assumptions underlying different conceptions of information are revealed. The essay thus develops 'meta-knowledge about the subject area' (Schwarz, Mehta, Johnson, & Chin, 2007) as it distinguishes four fundamentally different stances for understanding information among existing conceptions of information. Based on this a framework is developed that supports an accumulative research tradition in IS as differences and nuances among conceptions to information are compared and researchers can thus more easily build on conceptions of information provided by others.

Secondly, revealing that each of the four stances makes different assumptions about the nature and existence of information the essay discusses consequences following from each of the four different stances. That is, different stances on information have implications for understanding other important IS concepts such as data, knowledge, signs, human beings, social context, and technology. The essay thus introduces a 'consequential framework' disclosing how a particular stance on information has consequences for understanding other central IS concepts.

Thirdly, the consequential framework also acts as a gateway into the wider literature on information as it indicates how different branches of IS research may start advancing their conceptual engagement with information by working with particular stances present within the existing literature. Specifically, design science, behavioral research, and socio-technical IS research differ in their assumptions regarding the role and importance of technology, cognition, or organizational context for their research. Different branches of IS research therefore take different directions when looking at IS phenomena and are thus likely to approach information differently. The consequential framework of existing conceptions of information thus provides actionable suggestions on how to improve conceptual engagement with information in a wide range of IS research, while explicitly advocating diversity by acknowledging that researchers will and should bring different assumptions to their work. Doing this, the consequential framework contributes towards greater conceptual clarity regarding information and at the same time, responds to calls for more diversity in conceptualizing information in IS.

2. Existing meta-knowledge on information in IS

How information is described at a meta-level, that is how information is conceptualized and described across different research publications, is important as such meta-knowledge guides how the concept of information can be understood and used for IS research, practice, and education. The following section critically reviews the current state of established meta-knowledge of the information concept in IS.

At a broad level two conceptions for understanding information dominate IS research and teaching. The first conception understands information as data that is processed. In a survey of the current use of the information concept in IS research McKinney and Yoos (2010) argue that most IS research adopts a 'token view' of information according to which information is an "undifferentiated commodity of data bits that are processed" (McKinney & Yoos, 2010, p. 331). As data processed at some point may be further processed at another point this raises the question of how much processing is needed to convert data into information (Brier, 2004; Buckland, 1991; Mingers & Standing, 2014; Stamper, 1985). Furthermore, as there is no clear understanding of how information is different from data, the conception of information as processed data conflates the concepts of data and information (Lee, 2010). This restricts the ability to employ information as a separate and powerful concept in IS research (Lee, 2004, 2010).

The second conception introduces information as the middle ground between data and knowledge and sometimes also wisdom as part of the so called 'DIKW' hierarchy. This conception for understanding information is prevalent in IS textbooks

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