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Locating Frames of Reference for Information Systems: A Position Paper

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Abstract

Frame analysis has been applied in Information Systems (IS) research to generate understanding of such issues as organisational change and IS implementation. Frames are the unconscious interpretive schemas that people, or groups of people, use to interpret their surroundings, determine what is important, and guide their actions. While framing has been used as a theoretical lens in IS research into organisations, there has been no analysis to date of how frames may play a role in the IS field itself. This paper argues that is relevant and insightful to examine the IS discourse from a framing perspective. In order to demonstrate the potential value of such an approach, a subset of a collection of articles from six journals in the senior scholars' basket of journals was analysed in an exploratory attempt to locate the frames of reference that predominate in the IS discourse. Three levels of framing were identified and a provisional schema is proposed. We suggest that further investigation of the schema, the frames and their application will provide opportunity for critical reflection on the nature of Information Systems as an academic discipline. Such critical self-examination may even foster purposive frame breaking, in support of recent calls for transformation in the IS field.

Keywords

Framing, Frames of Reference, Ontology.

INTRODUCTION

Goffman's (1976) seminal article about framing held that frames of reference are "schemata of interpretation... rendering what would otherwise be a meaningless aspect of the scene into something that is meaningful" (p. 21). Frames of reference are seen as guiding both selection – how one's attention is directed, and salience – what one sees as important. These frames therefore play a key role not only in influencing perceptions, but also in shaping action (Collins and Pinch 1982; Leonardi 2011). The concept of framing was introduced to the information systems (IS) research toolkit by Bostrom and Heinen (1977), who found that problems associated with IS implementation could be attributed to the frames of reference held by systems designers. Since then, the concept has been used to examine the influence of technological frames of reference on IT implementations (Orlikowski and Gash, 1994; and others), and to gain understanding of issues relating to organisational change (Davidson 2006; Gallivan 2001), requirements determination (Davidson 2002), and IS adoption (Barrett 1999). A common theme in these studies is that members of different occupational and/or functional groups may employ significantly divergent frames in their interpretations of technology.

Although the theory of framing has been applied outwardly to analyse the role of IS in organisations, it has yet to be turned inwards, to consider how the frames of IS academics may be exhibited in, guide, and constrain, the field's discourse. Just as frame analysis may help build insights in an organisational setting (Orlikowski and Gash 1994), we suggest it may be useful for generating insights in an academic setting. Because frames of reference form a core part of a group's culture (Goffman 1976), frame analysis provides an opportunity to gain insights into the ontological and normative assumptions that underpin an academic field. In endeavouring to surface the frames that underlie and govern a field's discourse lies the opportunity to critically reflect on the role of frames in constructing that field's identity. We suggest that it is timely to explore how framing may operate in the IS field – a field long-preoccupied with its identity – given the recent calls that have been made for transformation, more self-critical analysis, and diversification of research foci and approaches (e.g. Walsham 2012; Davison 2012): The process of frame elaboration and critical reflection has been found to lead to frame-breaking, a process that is associated with the process of transformative learning (Mezirow 2000).

This paper explores whether the IS discourse contains frames of reference and how such frames might be structured. In the next section, we discuss the framing concept and the importance of frame congruence. We argue that the IS discourse as found in academic journals is the best representation of the frames of reference held in the IS field because of the unique characteristics of academic journals in terms of review, availability,

and legitimacy. This is followed by an outline of the method of our exploratory investigation. The remainder of the paper presents a provisional schema of predominant frames, with a brief discussion of each level. The paper ends with a consideration of the limitations and potential value of frame analysis of the IS discourse.

FRAMING AND FRAMES OF REFERENCE

*And so these men of Indostan
Disputed loud and long,
Each in his own opinion
Exceeding stiff and strong
Through each was partly in the right,
And all were in the wrong
(Saxe 1873)*

In order to explain the concept of framing, Leonardi (2011) used John Godfrey Saxe's (1873) telling of the famous Hindu legend, 'The Blind Men and the Elephant'. In this story six blind men aim to "see" an elephant. They each touch a different part of the elephant and interpret the animal as being different objects – a wall, a spear, a snake, a tree, a fan, a rope. Each of these conceptualisations of the elephant can be thought of as a frame of reference, or a personal interpretation of a phenomenon.

Orlikowski and Gash (1994) use the work of Gioia (1986) to conceptualise frames of reference as being "a built up repertoire of tacit knowledge that is used to impose structure upon, and impart meaning to, otherwise ambiguous social and situational information to facilitate understanding" (p. 56). They also suggest that frames of reference are implicit guidelines that help people interpret events. In effect, a frame of reference is a heuristic embodying the assumptions that individuals use to understand phenomenon. Just as the six blind men interpreted the elephant in terms they are familiar with, frames of reference serve the purpose of applying meaning or value to particular phenomena in terms that are consistent with those frames. Frames of reference are not only individually interpreted, but socially constructed and shared (Orlikowski and Gash 1994).

There are two main types of framing: communications-based framing, and social science-based framing. Communications-based framing is concerned with "variations in *how* a given piece of information is being presented" (Scheufele and Iyengar 2011). It focuses on how the assumptions underpinning topics are communicated to individuals. In contrast, social science-based framing, which Scheufele and Iyengar state has roots in sociology, psychology, and linguistics, explores not only how frames of reference are communicated, but also what is being communicated. (In the case of Saxe's blind men, communications framing would focus on the fact that the elephant is compared to everyday objects, while social science framing would also focus on the fact that the elephant is an important element of the frame of reference.) We use the social science-based definition of framing in investigating the IS discourse because in looking at predominant frames in the IS discourse, what constitutes the frame of reference is as important as how that frame is communicated.

Congruence

Saxe's (1873) poem also shows is that frame congruence or "the alignment of frames on key elements" (Orlikowski and Gash 1994, p. 180) is important in facilitating communication between people. Each of the six men had an incongruent frame about the elephant, and therefore rejected the other descriptions available. Within written discourse, communication is essentially from the author to the reader, so achieving congruence is essential. As Orlikowski and Gash (1994) note, frame congruence is not about achieving identical frames, but rather that the frames of reference are aligned in terms of structure (common categories of frames) and content (the meaning or value attributed to the particular phenomenon). Without this broad alignment, there is the risk that what is being communicated will either be devalued or rejected.

METHOD

The primary genre of discourse reflecting the IS field is found in peer reviewed academic journal articles. This genre is the most dominant, appropriate, discernible, and legitimate, and is therefore the best for exploring the schemata of interpretation (Goffman 1976) which underpin the academic field. We undertook an exploratory analysis in which the first author, a research scholar, analysed a sample of 48 articles from a pre-existing corpus of over 200 articles. The corpus was a collection of articles from the six journals in the senior scholars' basket of journals: the European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of AIS, Journal of MIS, and MIS Quarterly, spanning the years 2000-2010. These six journals represent the most highly regarded journals in the field of information systems.

The corpus, made up from every third article, represented a wide range of topics, styles, and methodologies. Purposive sampling was then used to identify a subset of 48 articles that provided sufficient contrasting material suitable for an exploratory analysis of frames. Because of the exploratory nature of this research, a coding

framework, utilising a mixture of deductive coding and inductive thematic coding was used to identify the structure and content of candidate frames. Deductive coding (see table 1) was used to structure the exploration of frames of reference, while inductive coding was used to identify candidate frames. Whole articles, rather than abstracts alone, were analysed. Particular attention was paid to the discussion, implications and conclusion sections, where frames were sometimes more easily surfaced. The information collated from the sample was then used to assess the main themes and structures within these predominant frames. Commonalities in terms of the level of applicability were then used as the basis of creating a schema or structure in the predominant frames. The three researchers met periodically over a two month period to cross-check coding, discuss divergent interpretations and review the emergent schema of frames.

Table 1. Deductive Coding Frameworks Used

Authors	Codes
Avgerou (2000)	Thematic Area
Davidsson and Wiklund (2001)	Level of Analysis
De Vaujany, Walsh and Mitev (2011)	Argumentative Strategies; Writing Style
Orlikowski and Baroudi (1991)	Research Philosophy; Time Period
Orlikowski and Gash (1994)	Technological Frames of Reference
Orlikowski and Iacono (2001)	IT Artifact

FINDINGS AND DISCUSSION

Open coding revealed three levels of predominant frames within the IS discourse: framing of contexts, framing of information systems, and framing of the article (Figure 1). Framing of contexts is the widest or highest level of framing within the discourse because the frames at this level are relevant to most types of academic discourse, both within and outside of information systems. Because the frames at this level are the most generalizable for academic discourse, they are also the most abstract frames in terms of specificity or scope.

Framing of information systems is the intermediate level of predominant frames and this level is relevant to the academic discourse within the field of information systems. As opposed to contextual frames, the scope of this level is grounded in assumptions of the information systems field. Framing of the article represents the frames of reference whose scope is bounded by the article.

Each of the three levels of framing within the IS discourse represents differences in applicability, generalisability, and scope. In totality they represent a schema within which to place the predominant frames of reference. The following sections discuss the frames of reference that constitute each framing level.

Provisional Schema of Predominant Frames in IS Discourse

The predominant frames identified in the IS discourse vary in terms of structural elements, content themes, and level of scope. This is shown as a framing system, or provisional schema of frames, with three levels of framing (framing of contexts, framing of information systems, and framing of the article), and seven predominant frames of reference (see Figure 1). Each level and its constituent frames are briefly described below.

Framing of Contexts

Within framing of contexts, we found three predominant frames of reference: Frame of the organisation, frame of people, and frame of research. Each of these are briefly outlined below, and summarised in Table 1.

Frame of the organisation is the contextual frame that relates to how the discourse frames the nature and characteristics of organisations. The structuring of this frame is based on an accounting conceptualisation of businesses in terms of the focus on profit, cost, and revenue. The three themes which are representative of the content within the frame of the organisation are evolution, financial objectives, and strategy.

Frame of People is the contextual frame concerned with the conceptualisations made of people, whether in the context of users, developers, managers, or others. Structural elements identified from the corpus were as follows; Firstly, a tendency for the human element of people to be devalued or ignored in favour of generalisation implying that in the IS discourse people are assumed to be equivalent or replaceable for the purpose of information systems. Secondly, the idea of economic rationality. An assumption that emerged from analysis of the corpus is that people make decisions based on utility, which is the premise of economic rationality.

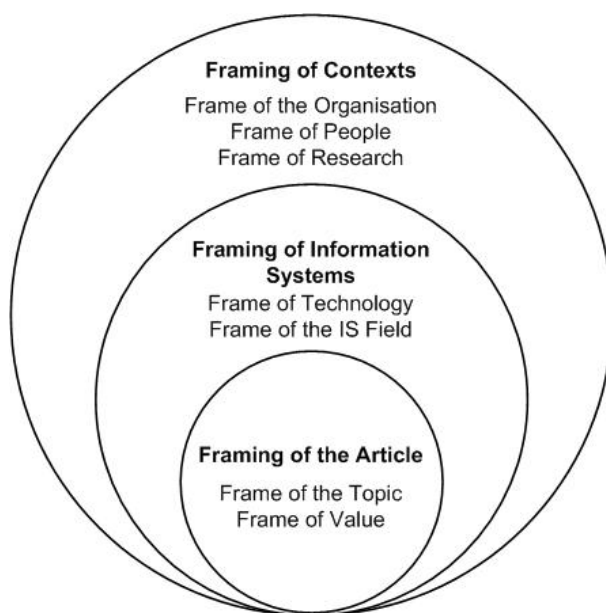


Figure 1: Provisional Schema of Frames (IS literature)

Two themes representing the prevailing content of the frame of people were identified in the sample, namely that people have evolved and that people are critical to IS. Evolution in relation to the frame of people in the IS discourse is a theme which relates to the idea that individuals are increasing their interaction with technology.

The ‘critical’ theme is evidenced by emphasis on the need to take people issues into account, as well as those relating to the technology. It can be seen that there is an inherent contradiction and significant ambiguity in the people frame. On the one hand the frame of people is defined in such a way that users are critical to the success of information systems. However, at the same time one structural element to the frame of people is that the IS discourse is dehumanising.

Frame of research is the contextual frame concerning how the discourse positions or values different research methodologies and viewpoints. As might be expected, one structural element to the frame of research is the analysis of previous research. Structurally, the frame of research in IS discourse is also informed by the notion of a norm which broadly correlates to the methodologies of the positivist tradition (Weber 2004) and the assumption that this norm of research is assumed to have more methodological legitimacy. The two predominant themes identified from the corpus are the deficiency of previous research and the need for objectivity in research.

Table 2. Contextual Frames, illustrated by examples from the corpus

Frame of Reference	Structural Elements	Content Themes	Examples
Frame of the Organisation	Accounting conceptualisations of business	Organisations and organisational contexts have evolved Financial objectives are important to organisations Strategy is important to organisations	Kohli and Grover (2008) Clemons (2008) Fui-Hoon Nah and Benbasat (2004)
Frame of People	People are dehumanised People are bounded by economic rationality	People have evolved Users are critical to the success of IS	Wagner & Majchrzak (2006) Rafaeli and Raban (2003)
Frame of Research	Previous research Positivistic norm of research	Previous research shows gaps Objectivity is important to the legitimacy of research	Wagner and Majchrzak (2006) Boudreau, Gefen, and Straub (2001)

Framing of Information Systems

Framing of Information Systems is the intermediate level of framing. This level relates to frames concerning both information systems and IS as an academic field. Within this level, two predominant frames of reference were found in the sample: the frame of technology and the frame of the IS field.

Frame of technology refers to the conceptualisation of the nature and purpose of technology in IS discourse. Orlikowski and Gash (1994) conceptualise the nature of technology as, “people’s images of the technology and their understanding of its capabilities and functionality” (p. 183). One way to structure the frame of technology

is through Orlikowski and Iacono's (2001) work exploring conceptualisations of the IT artifact. They identified five frame clusters: nominal; computational; tool; proxy; and ensemble. In their research, they found that there was a high level of use of nominal and computational views (Orlikowski and Iacono 2001). In the current exploratory study, framing of technology using more than one conceptualisation was common, and explaining frames of technology was common even when there was no IT artifact identified. This suggests that assumptions which underpin the frame of technology may be communicated independently of a formal description of the IT artifact.

Within the sample analysed, all of Orlikowski and Iacono's clusters were found except for the computational view. One explanation for this may be that when an article actually builds a model or algorithm, the discourse is likely to be very explicit in containing a description of the IT artifact because this description is the premise of the article. However, at the framing level this description may inhibit conceptualising other assumptions or frames about technology. Overall, the frame of technology can be structured using Orlikowski and Iacono's (2001) conceptualising of the IT artifact. Based on this, the major content themes of the frame were identified as being that technology is a tool and the proxy views of technology, specifically technology as capital.

Frame of the IS field is about how the discourse conceptualises information systems as an academic field. Debates about the legitimacy (Baskerville and Myers 2002) and core of the academic field of information systems (Alter 2003; Avgerou 2000; Benbasat and Weber 1996; Orlikowski and Iacono 2001; Robey 1996) form the structural component to the frame of the IS field. Within this frame, we found three predominant themes in the sample analysed: what is core to the IS field, the importance of the IS field to wider society, and the theme that the IS field is in crisis.

Table 3. IS Frames, illustrated by examples from the corpus

Frame of Reference	Structural Elements	Content Themes	Examples
Frame of Technology	IT Artifact (Orlikowski and Iacono 2001)	Technology is either: not defined, or is defined as a tool	Allen et al. 2006 Peppers et al. 2007 Agarwal and Lucas 2005
Frame of Value	Debate about the core of the IS field	What is the core of the IS field? IS is important to wider society IS is in crisis	Rafaelli and Raban 2003 Mani et al. 2010 McAfee 2007

Framing of the Article

Framing of the article is the narrowest level of framing within IS discourse, and relates to the scope of frames bound by the article. Within this level, there were two frames of reference that were predominant within the sample: frame of the topic, and frame of value.

Frame of the topic is the article-level frame concerned with the assumptions that inform the nature and value of the topic. How the discourse frames the topic for the reader is important because if there is incongruence about the topic, the reader may reject or discount the discourse. Because the topic is central to the value of the discourse, ensuring congruence about the frame of topic is essential. We identified two structural elements: the thematic area of discourse and the provision of an overview in the form of an outline of topic and scope.

Avgerou (2000) outlined five different thematic areas for information systems research: applications of IT to support the functioning of an organisation; the process of systems development; IS management; the organisational value of IS; and the societal impact of IS. However, we identified a group of articles which did not fit any of Avgerou's thematic areas – in these cases, the genre involved reflections on the discourse (for example Boudreau et al. 2001), reflections of the IS curriculum (for example McAfee 2007), or reflections on IS research (for example Allen et al. 2006). For this reason, we adapted Avgerou's thematic areas to include a new category, reflection on the IS field. The second structural element appeared to be predominant within the IS discourse, with nearly every article in the sample containing an overview of the topic. The two categories of content themes identified were positive themes and negative themes. *Positive themes* frame the topic in terms of its value. *Negative themes* do the converse, emphasising that the topic is challenging, complex, or problematic.

The *frame of value* concerns assumptions about the value of the article and the resulting discourse. The prevailing structural element to this frame is the evaluation of previous research. As with the frame of the topic, there were two categories of content themes, positive and negative. Positive value themes within the frame of value attempt to frame the discourse as adding value to the knowledge base of the IS field. Negative value themes seek to frame the value of the discourse by negatively evaluating previous research. Content themes in this category include the deficiency of previous research, and a gap in the current body of knowledge.

Although both the frame of topic and the frame of value contain these categories of content themes, the difference between the frame of topic and the frame of value is to do with subject matter. For the frame of the topic, the focus of the frame is about the subject of the discourse. For the frame of value, the focus is about

valuing the discourse itself. Therefore, although both contain the same categories of frames, the scope of the frame of the topic and the frame of value differ.

Table 4. Article Frames, illustrated by examples from the corpus

Frame of Reference	Structural Elements	Content Themes	Examples
Frame of Topic	Thematic Area (Avgerou 2000)	Positive Themes Negative Themes	Payton et al (2005) Wagner and Majchrzak (2006) Grant and Ngwenyama (2003)
Frame of Value	Evaluation of previous research	Positive Value Themes Negative Value Themes	Kvasney and Keil (2006) Iivari and Huidman (2007) Mahrer and Krimmer (2005)

CONCLUSION

The concept of framing is a familiar one in the IS discourse. Turning this concept around and applying it as an analytical tool to the discipline itself is novel and we hope that it may act as a catalyst for further research. The purpose of this research was to generate debate about the assumptions that underpin the discourse in information which is essential to an ontological understanding of this form of scholarship.

We have argued that there is value in utilising framing as a theoretical lens to examine IS literature to help surface the implicit sets of norms and assumptions underpinning discourse in the IS field. Frame analysis can be seen as both a catalyst for enriching critical self-reflection on IS as an academic field and a means of encouraging evaluation of the value of dominant frames in past, present and future work. We have outlined an exploratory application of frame analysis of a set of articles from the flagship IS journals that are accepted as embodying “the best of” IS research. Three sets or levels of frames resulting from this exploratory analysis have been outlined and briefly discussed. The small sample of academic papers used in this project is acknowledged as a limitation; however, sufficient evidence has been generated to develop a provisional outline schema of frames. There are two further limitations of frame analysis of this kind: Firstly, applying frame analysis to a body of content is a difficult and subjective undertaking. The frames of researchers will inevitably influence what they perceive as being frames. The frames identified here should be therefore seen as illustrative set from a larger range of possible options. We suggest that a more comprehensive study, using cross checking by multiple researchers and a larger literature sample, would be of value in future studies. A second limitation is the substantial lag-time between the completion of research and its appearance in the “senior scholar’s basket”: Frames in any field should be expected to undergo gradual change. It would be immensely useful to gain insights into frames that are coming through the publication pipeline, and to gain insights into any frame bending or breaking.

Perhaps the key value of frame analysis is in its potential to support the kind of critical reflection that can guide meaningful frame transformation. The need for transformation in the IS field has been signalled in various opinion pieces, such as Walsham’s (2012) “Are we making a better world with ICTs?” and Davison’s (2012) commentary in the same issue of *Journal of Information Technology*. These works portray the IS field as being characterised by an uneasy, yet persistent tension between the stable status quo of publishing practices and a dramatic flux in technological and societal change, in the contexts in and ends to which IS are applied, and in the research questions that matter. As Walsham (2012) has noted, “The world has changed dramatically since the days of design and development of business and government systems....The new technologies, methodologies and contexts of the current era need proactive and flexible approaches to address them...” (p. 92). In relationship to future work in inter-disciplinary contexts, which will involve engaging with such diverse disciplinary bases such as anthropology, economics, development studies and computer science, he notes that there “is no room in this room for dogmatic adherence to old approaches” (p. 92). According to Mezirow (2000), the identification and elaboration of frames of reference, and the challenging or breaking of frames, are critical parts of the transformative learning process. Frame elaboration helps to surface assumptions and habits of mind and thus fosters the critical examination of frames that may lead to subsequent frame breaking.

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