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INCREASING RELEVANCE IN IS RESEARCH: CONTEXTUALIZING KNOWLEDGE IN NETWORKS

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Research in Progress

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Abstract

Relevance is useful and actionable knowledge *in situ*. It is a result and condition of 'knowledge exchanges' between practitioner and scientific communities taking place in heterogeneous knowledge networks. Whereas IS research has traditionally emphasized a *selection* perspective in disputes around relevance preferring scholarly community's viewpoint over the other, this paper articulates a *networking* perspective which analyzes enablers, competencies and barriers for useful knowledge flow across communities. After introducing main types of knowledge that flow in the knowledge system we apply the concept of absorptive capacity to analyze the outcomes and processes of knowledge exchanges and map how each type of knowledge is sought and absorbed by one community from another by leveraging specific knowledge networks including the focal one. Given little empirical research about a) how IT managers and other high level IT professionals (consultants, etc) source and exchange different forms of knowledge in their practice, and b) the properties of this knowledge such as its volatility, accuracy, validity demands, forms of sourcing, genre or presentation, we outline a field study on salient knowing and knowledge practices among high achievement IT individuals with significant careers. Preliminary findings are reported.

Keywords: Relevance of IS Research, Knowledge Network, High level IT Professionals, Communities of Practice

1 Introduction

Despite a plethora of debates around relevance in Information Systems research, we face often a feeling that 'relevance' is lost in the field as witnessed by the history of the topic from "MIS is a Mirage" to 1999 Special issue in MIS Quarterly and Communications of the AIS (CAIS) 2001. At the same time, critics argue that relevance has no relevance due to its vague use. We start with an assumption that relevance needs to be defined in relation to practices, because useful knowledge is always embedded in practices (Schatzki, 1996). Thus, in the end the relevance of academic knowledge is related to the local ways of knowing and co-evolves with practice changes. We consequently view relevance as a result and condition of 'knowledge exchanges' between practitioner and scientific communities of practice (CoP) in the context of knowledge networks (Phelps et al, 2012). The knowledge exchanged in these networks will be relevant only if it is impactful by influencing the other CoP in some way (i.e. they would behave or believe differently without this exchange). Relevance of knowledge is defined as useful and actionable knowledge *in situ*. Relevant knowledge is informed by action and, in turn, shapes how action unfolds in a specific context. To be capable of exchanging knowledge, both parties need to increase their absorptive capacity (ACAP) with regard to the other CoP. Analyzing exchange from the ACAP viewpoint suggests a relational view where the ACAP of both sides jointly influences the relevance of knowledge produced. In other words, relevance as a whole emerges from the joint interaction and related levels of ACAP. However, building this capacity is difficult. Absorbing knowledge from the other side is tension driven due to differences in knowledge (learning barriers) and logics, time frame, incentives and practices (Bartunek and Rynes

2014). Part of the lost relevance problem is that, to manage these tensions, IS research too has long emphasized a *selection* perspective preferring one view over the other, be it that of the academic community or of the practitioner community (Bartunek and Rynes 2014). This paper will avoid taking sides. Instead it aims at developing a *networking* perspective that helps each community understand better the other community and the networks they use to exchange knowledge. Typically this allows to identify and analyze enablers, competencies and barriers for knowledge flows across communities.

In the first section of this RIP paper, we present the literature on relevance and articulate a knowledge networking perspective which, we argue, constitutes a novel approach in relation to prevalent perspectives on relevance. We also introduce the main types of knowledge that constitute the subject of exchange and review criteria defining the validity of exchanged knowledge for both communities. Then, we present the absorptive capacity lens through which we analyze outcomes of knowledge exchange which enfold in the network model. The core of this paper will map how each type of knowledge is potentially absorbed by another community using knowledge exchange networks. This networking perspective requires to investigate empirically where and how especially the practitioner community sources and absorbs knowledge, including from the IS research community. The third section will briefly describe the methodology for this investigation. We conclude this RIP paper by giving some preliminary results, before we recap the main expected contributions and limitations.

2 Literature background, lens and model

2.1 Relevance and the networking perspective

Rigor in producing and using research is about generalizability (Lee and Baskerville 2003) and systematic way of grounding knowledge (Dubé and Paré 2003), whereas relevance is contextual, varied and unique. Thus there are always tensions (CAIS Special Issue, 2001) and these two aspects of using knowledge form a duality, which needs to be 'reconciled' (Bartunek and Rynes 2014). Seo et al (2004) identify various ways to manage such tensions such as selection, integration, transcendence and connection. Bartunek and Rynes (2014) argue that most frequently when addressing the academic-practitioner relevance gap, these tensions have been managed through the *selection mode*, i.e. by taking sides in favor of the academic tribe favoring either its relevance or rigor criteria. In contrast, they advocate a *connection* perspective acknowledging both poles and demonstrating interest in each of them. In this paper, we adopt the connection mode and develop a *networking* perspective that helps each community understand better the other community and the networks they use to exchange knowledge. Although both the academic and the practitioner communities use the same principal set of knowledge components, they do not apply the same qualities thereof, and most importantly, they do not source the knowledge using similar networks. Moreover, most actors in each respective community are only vaguely aware that there are such differences, and, at best, they have a myopic view of the knowledge networks deployed by the other community. It would be naïve to provide a complete view of each knowledge network to the other. However, understanding the needs and practices of each community for knowledge exchange and how these needs are fulfilled in practice is critical, not only to create respect of each other, but also to make the most of the knowledge they exchange between them. Such *networking* perspective helps avoid misunderstandings and fosters appropriate knowledge flows between the two communities and ultimately stimulates the production of knowledge that improves knowledge deployment in both communities.

2.2 Types of knowledge

Different communities process and exchange different types of knowledge. In organizations people process mostly explicit and transferable knowledge, but in face-to-face interactions individuals and groups also exchange sticky (Von Hippel, 1994), and local knowledge that is often tacit (Nonaka et al 2000; Klein and Rowe, 2008). Most academic flows, in contrast, relate to explicit, articulable knowledge with dedicated calls for generalizability, logic of cogency, and uses of specific types of

warrants, which cannot be attributed to personal experience or authority (Toulmin 2003). Knowledge has also multiple components, which can serve diverse functions and provide a foundation to act in these environments: either to sense environment, make sense of it, identify problems and related changes, provide grounds or warrants for action (e.g. decision rules), or giving constraints or goals for action. These forms of knowledge may have different conditions and mechanisms for translation and embedding though most models of knowledge exchange and absorption do not recognize this. We will therefore classify knowledge components into 5 classes of knowledge based on these characteristics. We draw upon Gregor's (2006) typology of different types of IS theories, Arthur's (2011) analysis of the nature of technological knowledge and Cohen and Levinthal's analysis of barriers towards knowledge absorption (1990). Table 1 summarizes each form of knowledge with references to exemplary research in IS domain articulating that type of knowledge..

The first type of knowledge is *factual knowledge* generalized from a set of populations. This knowledge expresses the state of the world around us. Many times such knowledge is also called 'stylized facts' as they provide factual representations of behaviors and related patterns, or relationships between different elements of knowledge. Such knowledge is captured for example in growth patterns, rankings between specific items and so on. The second type of knowledge is *technical knowledge* which describes how specific artefacts behave, their properties or operating principles. This knowledge expresses the state and features of the technical artifacts around us (such as IT artefacts). Such knowledge is expressed in technology manuals, discussion of the trends and functions of technology and so on. The third type of knowledge is *cognitive knowledge.* This knowledge provides ways to classify, organize and relate different elements in the world. It expresses current state of organizing and making sense of the environment and how 'read' related stimuli. Such knowledge is expressed for example in organizing frameworks for strategy analysis, analysis models for investment and so on. The fourth type of knowledge is *explanatory knowledge* which provides explanations and predictions of how factual knowledge come about. This knowledge is grounded in specific forms of cognitive knowledge, which gives the means to organize the information about the world in specific patterns. Explanatory knowledge adds to this knowledge additional logics, which express how the world operates, how different facts or elements interact, and how these interactions produce specific outcomes. In its most articulate form such knowledge is expressed in generalized explanatory theories around domains and related behaviors – for example how decision are made, and what are the most likely outcomes in such settings. Finally, *ethical knowledge* expresses value principles, norms, or goals how the world *should* behave, what are desirable states in the world or ways of maintaining such states. This knowledge is expressed in goals, value statements or mission articulations for specific operations.

Knowledge component	Key Function	Types of knowledge in knowledge networks	Criteria for judging knowledge quality	Examples in IS domain
Factual knowledge	Sensing and representing environment Observing trends and changes	Factual statements and related correlations and predictions of IT related phenomena	Representativeness Presence of error or bias Accessibility Representation / display for understanding	Ranking of top issues among CIOs Risk factor rankings (Schmidt et al 2001) Benchmarks (Luftmann and Kempaiah, 2007)
Technical knowledge	How artifacts are configured or work Principles of configuring and evaluating artifacts	Knowledge of IT artifacts which embed novel social and/or use theories Methods, decision rules and guidelines for advancing and evaluating designs	Novelty Explanation (kernel theory) Demonstration of usefulness Accessibility	GDSS (Easton et al 1992) Ontology based conceptual models (Wand and Weber 2002) DSS systems (Sharma et al 2010)

Cognitive knowledge	Making sense or giving sense to factual or technical knowledge Articulating ways to account behaviors or situations	Sense-making frameworks for identifying, understanding and exploring situations	Novelty Coherency Potential for Sense-making shifts	Risk management frameworks (Barki et al, 1993); Strategy alignment frameworks (Henderson and Venkataraman, 1993); Digital options (Sambamurthy et al 2003)
Explanatory knowledge	Offer warrants for decision rules or related constraints Offer ways to fit factual knowledge to predict outcomes of interventions	Knowledge attributing cause effect relationships or other types of empirical relationships (precedence, sufficiency conditions) in the IT domain	Validity and reliability of explanations Parsimony and explanatory power Simplicity and or accuracy	Explanatory models of IT productivity (Hitt and Brynjolfsson, 1997); Effects of IT on organizational Agility (Tallon and Pinsonneault 2011)
Ethical knowledge	Key elements for social bonding and cohesion Motivation and guidance for action Constraints for socially undesirable outcomes	Knowledge expressing goals, values and/or norms	Coherency Validity Alignment with stakeholder interests	ETHICS (Hirschheim and Klein 1994) Comparisons of Value systems (Mingers and Walsham, 2010) Green IT, Privacy (Mason and Mitroff, 1981 (SAST))

Table 1: Types of knowledge

2.3 Knowledge exchange in light of ACAP theory

We next anchor the relevance construct in theory of absorptive capacity (Zahra and George 2002) defined as an "ability to identify, acquire, integrate, and exploit … knowledge" for skillful accomplishment of salient tasks in a CoP. Conceptually, Zahra and George's (2002) theory introduces four phases of knowledge absorption: identification, assimilation, transformation and exploitation. Table 2 provides a definition of each of the phases and examples of how such ACAP phases can be carried out in IS research context for the IS academic CoP (ISC) and for the IT Practitioner CoP (PRC). In our context this suggests that when two CoPs interact, relevance is the product of ACAP related behaviors. Consequently, members of the either side of the knowledge exchange have to build up ACAP to identify, assimilate and use knowledge from the other side. Accordingly, ACAP gives a primary criterion to define relevance within the knowledge exchange: only knowledge which gets assimilated, transformed *and* exploited is relevant - i.e. it is useful and actionable knowledge *in situ.*

ACAP Process	Definition and process characteristics	Example in ISC vs. *PRC*
Identification (ID)	Identification of knowledge in the environment • Scope of search • Perceptual schema • New connections • Speed of learning • Quality of learning	Participation in Practitioner Conferences *Participation in Academic Conferences* Joint Workshops Participation in Social Media
Assimilation (AS)	Integrating knowledge to current mental models • Interpretation • Comprehension • Learning	Joint think tanks, pilot studies Field participation, *Management education*

Transformation (TR)	Recombining or dissociating knowledge as a base for discovery or new type of action • Synergy • Recodification • Bisociation	Joint (action) research projects Consulting engagement involving both parties to change the setting and research priority *New strategy direction based on novel analysis*
Exploitation (EX)	Mobilizing and harnessing the knowledge for action • Use • Implementation	New research initiatives resulting from collaboration with practice *Change programs informed by research study*

Table 2 : ACAP and relevance

2.4 The knowledge network model

Overall, based on ACAP model relevance is determined by the actor's ACAP within both communities. This idea denies unidirectional 'pipeline' model of knowledge transfer from ISC to PRC that dominates discussions of relevance (Van de Ven and Johnson 2006). In such discussion relevance is defined as a static property of the knowledge in the source and forms of its packaging when it flows in the network between the communities (e.g. (Benbasat and Zmud, 1999). In contrast the ACAP model suggests that relevance is embedded and is an outcome of the capabilities residing in knowledge networks (Mohrman and Lawler 2011). This raises the issue of how to build up ACAP capabilities in such networks covering topics like incentives and related effort to participate in ACAP related activities, what is the differentiation of knowledge generation and use across different constituencies covering knowledge production and absorption sides, and how to address different knowledge effects at both sides of the network. In the context of IS research such lens suggest to analyze relevance as a ongoing process of using ACAP in both directions of knowledge exchange (from research community to practice and vice versa) and also recognize the important role of other communities in such exchanges (See Figure 1).

Consequently, IS research can have applicability in situ, if related knowledge creation, sharing and expansion are processes across different communities that rely on ACAP working in both 'ways' between the communities. In such setting related cognition is distributed (Boland et al., 1994) and needs to be connected across constituencies. This creates also difficulty since different types of

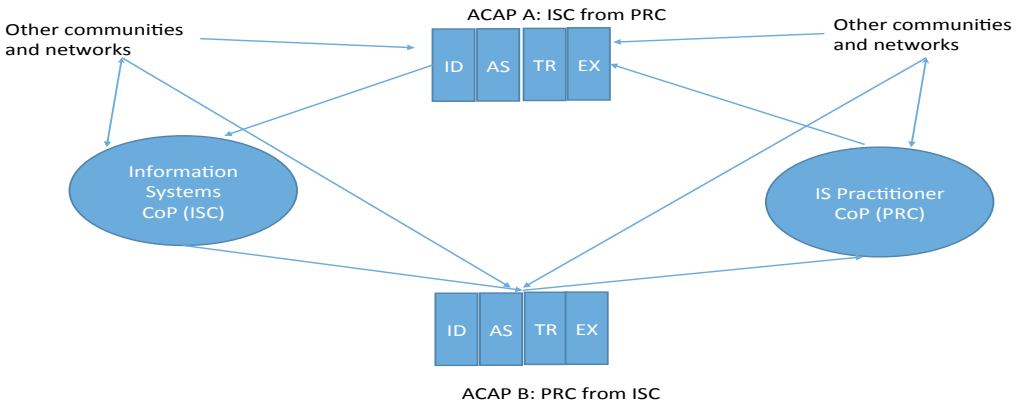

Figure 1: The ACAP knowledge network model

knowledge may originate from different CoPs and actors and related ACAPs will be different. For example IS users value normative and factual knowledge, policy makers and managers value factual, cognitive and explanatory knowledge; while implementers may value technical, cognitive and factual knowledge. As a result, different types of knowledge pose different demand for absorptive capacity in potential interactions between the communities: A: ISC from PRC; B: PRC from ISC (cf. Figure 1). Moreover, the factors that influence relevance and the barriers that thwart it during ACAP related interactions are not widely recognized. If ISC seeks to increase its relevance, it needs to examine *all factors* that influence *all phases* of ACAP process and examine how these processes operate at the level of *both links* and what are *the levels and types of knowledge use* within the overall knowledge system. This helps IS scholars to become more reflective and examine diligently when specific types of knowledge become useful and actionable for other party.

Relevance for ISC questions the strength of link A: to what extent do IS scholars need to identify problems that are meaningful for IS practitioners to conduct successfully their research? To what extent do they need to adapt their ways of problem framing and finding as to engage in a meaningful dialog with practitioners? This has only been discussed in passing in some settings. Notably, Zmud's editorials in the 90's observed the need to interact with practitioner conferences for 'sensing' and 'input'. Often the sensing has been criticized as chasing 'fads' and resulting in weak generalizability because scholars get 'lost' in multiple waves of technology which may have no real meaning in a broader context. This has been noted as the lack of relevance, because generalized 'reference theory' adopted in many IS studies is not context specific and dictates what can and should be studied (Grover and Lyytinen 2015). Grover and Lyytinen therefore emphasize the role of identification and assimilation from emerging empirics in generating relevant generalizations and related IS theories. Such relevance is also often curtailed by the 'paucity' of data that help identify and assimilate PRC knowledge.

Link B in figure 1 is also fundamental because ACAP of PRC may not be adapted to what IS academics produce. The timing and nature of content flowing for absorption is often problematic - for IS scholars the time frames are long and uncertain while for practitioners they are short term and certain. As a result, most research has focused on 'easing' assimilation at the PRC level - notably in terms of how to package knowledge in articles that are accessible for practitioner communities. However, As Figure 1 shows, PRC also interacts with other CoPs and is not a captive target of ISC.

3 Usefulness of the model and methodology

The proposed ACAP network model can be used as a baseline to also analyze the types of knowledge flows that take place between the communities (cf. appendix) and answer questions such as: What are the mechanisms and forms which enable identification, assimilation, transformation and exploitation of knowledge in either link? Or, What are significant barriers for knowledge use and what are the competencies required by either CoP to engage in various absorptive activities? From our initial analysis we can derive three key observations on ACAP of PRC from multiple sources, including ISC. 1) ISC mostly likely impacts cognitive and explanatory knowledge of PRC - there is some impact in technical knowledge but it is minor; Most such knowledge is currently mediated through other CoPs (consulting, publishing). 2) PRC interactions with ISC are constrained by high search costs related to identification. 3) PRC does not have capabilities to select and assimilate ISC knowledge even if identified, nor incentives to invest significantly in capabilities to absorb cognitive / explanatory knowledge.

Despite observations on ACAP of PRC, we currently know little how IT managers or other IT professionals (e.g. consultants) rely on different forms of knowledge in their practice, how they source such knowledge and how they embed this knowledge in their practice (Van de Ven and Johnson 2006). We also know very little about properties of this knowledge and related knowledge exchanges.

Therefore, we decided to conduct a field study to examine how different types of knowledge are sourced and deployed by IT professionals. We are interviewing over 20 high level IT professionals focusing on CIOs and Senior consultants across different IT knowledge fields. We examined two institutional contexts (US/ France) to reveal potential differences in institutional setting of how knowledge is located. Institutional settings where firms have built ties with the ISC (e.g. CIGREF, the CIO club of large firms in France, who selects the best papers in *Systèmes d'Information et Management*, and funded the first CIO workshop at ICIS (in 2008) and the ISD research program) may signal stronger sensitivity to ISC knowledge. Our sampling was purposeful as we sampled for knowledgeable, high achievement individuals with significant successful careers in different IT domains. We also included people with Doctoral Education and lower professional academic degrees (such as MBA) as to a) see if people having an orientation towards academic knowledge such as those who entered a doctoral education program were already prone to using academic knowledge and b) identify the potential impact of scientific training on knowledge sourcing and use.

4 Preliminary results, limitations and expected contributions

So far we have interviewed 6 senior IT professionals in the US and 3 in France with some tentative findings. Overall, consulting firms seem to play a major and dominant role in the overall ACAP of PRC. In particular, for *external* factual knowledge, consultants and especially Gartner forms a major source. Technical knowledge is mostly developed by vendors or partners or by recruiting appropriate people. It is also done at times internally, often before discovering that the firm actually suffered from Not Invented Here syndrome. PRC's cognitive knowledge does not develop internally. This is the only type of knowledge they sometimes noted that the ISC creates and which can be relevant. PRC does not know what academics know and what they can deliver and related search cost is high. Explanatory knowledge did not emerge as something that is frequently needed and deployed. PRC rarely faces an occasion where it needs to truly explain things. When its members do it, it emerges as a likely explanation after they rule out other non-plausible explanations until 'things work again' (a.k.a. fault diagnosis). This form of explanatory offers a possibility for IS CoP. When representatives of PRC referred to real situations of trying to explain something, they noted that they had to build local contextual theories with consultants, or internally where they often refine the explanation following trial and error. Sometimes they sought to buy explanatory knowledge from the market, or from vendors. Too high cost and time constraints for finding relevant explanations were deemed as the main barrier. Their learning about explaining the world is highly contextual and experienced-based and overall exhibits a kind of continuous localized Popperian logic of falsification which uses flexible, context-sensitive and low level classifications. This form permits constant exclusion of causal accounts that are incompatible with the current situation and only keeping those which cannot be ruled out. This helps anchor the explanations to the needs of the local situation, which also makes them directly understandable for others involved in the situation. Ethical knowledge is not something PRC needs to exploit often as a forefront activity. Use of such knowledge depends both on the compliance needs towards company rules (which occasionally raise such issues) or confrontations with personal values. These have little to do with ISC as such or with consulting unless there are highly specific circumstances calling for such knowledge, such as a major violation of regulatory rules or security breach with a reputation damage.

The model offers a novel sensitizing device to understand how relevance is constructed; relevance is not about one way transfer or the property of any knowledge as such (Mohrmann et al 2011). The model recognizes also the input side for each type of knowledge for ISC, not just its 'output'. Empirical contribution can provide a detailed understanding of the knowledge sources and types of knowledge used for PRC. However, one of the limitations of this research is that the degree of routinization and contextual use of knowledge can not be addressed with the data collection methodology we used (talk vs. Walk).

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Appendix

Table for Process B: ACAP of PRC from multiple sources including ISC legend: a) how Decision-Makers (DM) (get their info)? b) what part of it is provided by IS CoP? *Where the difficulties for PRC are?*

	Identification	Assimilation (AS)	Transformation	Exploitation
Factual Knowledge	a)Aggregating media channels/consulting reports. b) filtering by aggregators. *High search costs for alternatives and difficulty of recognizing bias*	General routine for DM *Selecting valid information/Knowledge*	Mostly intuitive and delegated to consultants Public media coverage *Contextualizing the inferences Critically questioning the inference logic*	Routinized testing *Implementation Risks*
Technical Knowledge	Aggregated with supervendors and consultants Filtered through them *High search costs for alternatives and credibility and size risks*	Assumed to be a Routine because it is a necessity *Little or no capability and decreased capability*	Core routine but involves learning risks *Novel technical knowledge (Design Science) hard to transform*	Core routine but involves technical and skills risks *High risk of not being exploited due to novelty*
Cognitive Knowledge	a)Aggregating media channels/consulting reports. b) Consulting engagements d) Public media *High search costs for alternatives and difficulty of recognizing bias*	Routine for DM as to reframe IT uses *High AS cost for novelty Require significant investments in packaging by consultants*	Few routines (except for large firms) Haphazard and difficult to implement *High levels of causal ambiguity make difficult to justify and hard to demonstrate*	Simple models easier to use an become often routinized *Use is path-dependent and context driven*
Explanatory Knowledge	Rarely aggregated or available *Huge search costs Due to difficulties in interpreting and confounds have high level of causal ambiguity*	Few capabilities in ISC(lower than in MKG, FI, HR, ACC) *Dependent on packaging. No evidence-based IS systems available.*	Few or no routines (different from medicine) *High cost and/or ambiguity of showing value*	Not routinized (in contrast to medicine) *Calls for high level of investment with few incentives*
Ethical Knowledge	Public media Social aggregation *High search costs for specific topics of interest (such as creeply, green IT)*	Few capabilities unless facing threats or regulatory demand *Highly contextual, role and impact of knowledge not easy to demonstrate*	Routinized if has to be assimilated into policies and regulations *Unlikely that PRC will search for it!*	Parts related to regulation partially routinized *Highly contextual, demonstration of benefits sometimes difficult*