Internet Appendix A128: Digital Representations

A128.1 Illustrative Pitch Template Example

Pitcher's Name	Mark Bremhorst	FoR category	Business Information Systems	**Date Completed**	10/6/2016
(A) Working Title	Improving Situation Awareness with Digital Representations				
(B) Basic Research Question	How does our frame-of-reference influence the meaning and usefulness of computer representations?				
(C) Key paper(s)	Serrano, C., & Karahanna, E. 2016. The Compensatory Interaction between User Capabilities and Technology Capabilities in Influencing Task Performance: An Empirical Assessment in Telemedicine Consultations. ***MIS Quarterly,*** 40: in press. Endsley, M.R. 2015. Situation Awareness and Misconceptions and Misunderstandings. **Journal of Cognitive Engineering and Decision Making**, 9: 4-32. Weber, R. 2012. Evaluating and Developing Theories in the Information Systems Discipline. **Journal of the Association for Information Systems**, 13: 1-30.				
(D) Motivation/Puzzle	Given the computational power and diversity of decision support systems, why does human judgment still dominate human decision-making? How do decision makers acquire information from computer representations and incorporate the meaning of those representations into their actions?				
THREE	**Three** core aspects of any empirical research project i.e. the "**ID**io**T**s" guide				
(E) Idea?	**Core Idea:** 1. Attempts to augment human judgment with computer representations proceed from the belief that computational processes model cognitive processes. On the subject of representations that model events (changes to the states of things) I propose a new theoretical model, labelled comparative-cognition, to describe the factors that inform human judgment as it occurs in the mind of a decision-maker when they refer to a decision support system. 2. The concept of state tracking derives from Representation Theory. The state tracking model provides a theoretical model to describe how computers represent real-world events. The concept of frame-of-reference misfit derives from information systems fit literature and frames-of-reference literature. Frame-of-reference misfit describes decision-making behaviour in which individuals apply generally accepted decision rules to resolve a judgment problem caused by imperfect information. 3. In the proposed comparative-cognition model, poor state tracking implies poor event-representation by a decision support system which leads to lower situation awareness in the decision-maker. In contrast, good state tracking implies good event-representation which leads to higher situation awareness. I also posit that state tracking's influence on situation awareness is influenced by frame-of-reference fit. High frame-of-reference misfit weakens the influence of state tracking on situation awareness because of the conflicts between representations' and individuals' respective real-world conceptualisations. Conversely, low frame-of-reference misfit strengthens the influence of state tracking on situation awareness. These predicted effects lead to the following proposition. 4. ***Proposition 1:*** *The quality of state-tracking and the extent of frame-of-reference misfit, jointly influence situation awareness.* 5. When state-tracking is poor, situation awareness will be poor, but when state-tracking is good, the benefit for a decision-maker's situation awareness will depend on the frame-of-reference misfit, with greater benefits resulting from lower misfit.				

Cued Template taken from Faff, Robert W., Pitching Research (March 22, 2015). Available at SSRN: http://ssrn.com/abstract=2462059 or http://dx.doi.org/10.2139/ssrn.2462059

	Tension: Proposition 1 should extend information systems research leading to new predictions rather than challenge existing theories.
(F) Data?	**Country:** Australia. **Reason:** Convenient and amenable to the case study. **Unit of Analysis:** Aggregate information system. **Observation Sampling:** Longitudinal. **Data Type:** Industry specific (health care). S**ample Period:** Q1-2016/Q4-2018. **Sample Size:** 25-40 interviewees. **Data Sources:** Interviews based on approved case study protocol. **Missing Data:** Unlikely to be a problem given the nature of the study. **Test Variables:** Preliminary interviews suggest the variables demonstrate sufficient variation to observe the operational linkages among them.
(G) Tools?	**Research Design:** I employ a case study to explore the proposed model because a theory of "comparative-cognition" is the first attempt to link Representation Theory's state-tracking model to a cognitive theory of situation awareness. The proposed model therefore lacks substantive theoretical support. Moreover, using a case study methodology permits observation of the purported operational links among the model's constructs which should support detailed explanations of how the constructs influence each other (Yin, 2009:9). **Sampling:** I employed purposeful sampling and selected a health services information system for this case study. The health services context matches the social context required to explore the proposed model because the model describes information systems with relatively stable data definitions that are made available in social arenas governed by well-defined rules.
TWO	**Two** key questions
(H) What's New?	The novel idea that frames-of-reference directly influence the relationship between computer representations and cognition by enabling and constraining comparisons.
(I) So What?	Understanding elements of commonality between the deep structures of both computer representations and cognition will increase our ability to design computer representations that improve decision makers' judgment.
ONE	**One** bottom line
(J) Contribution?	**Theoretical Contribution 1:** The model provides a general theory describing how decision support systems contribute to human judgment through computer representations which could provide common ground among the fragmented areas of the decision support literature (Arnott and Pervan, 2005). **Theoretical Contribution 2:** This research project will extend theories that explain which aspects of digital representations contribute to better human decision-making.
(K) Other Considerations	**Target Journals:** A* journals such as MIS Quarterly or Information Systems Research **Risk:** Ethical clearance and site access were granted in April 2016. The risks for this study include access to participants and risk of not finding empirical support for the model. Researching the so-far unexplored state tracking model lowers the risks from competitors but increases the risk to the proposed model's acceptance among the information system's research community. **Scope:** The flexibility of the case study method will cater for scope adjustments if required.

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