Position Statement for
David J. Saab

On the Importance of Cultural Schemas for Information System Ontologies

Statement of Interest

In the next 25 years we expect to see the devastating impacts of climate change upon our planet. The transnational need for communication and the intercultural challenges it poses requires a comprehensive, interdisciplinary approach to create communication systems that will allow for better coordination of decision-making about resources--food, water, medical--and their associated supply chains.

Misunderstanding the scale of change taking place has consequences. If dire predictions have any validity, then the human population of 6.5 billion will be put under severe stress. Potential massive population shifts are likely to occur because of flooding and the rise of ocean levels planet-wide, affecting populations in Florida, San Francisco Bay, The Netherlands, Beijing, Shanghai (40M), Calcultta and Bangladesh (60M), (Guggenheim, 2006). The possibility of 100 Million displaced persons is an event, the likes of which humanity has never confronted.
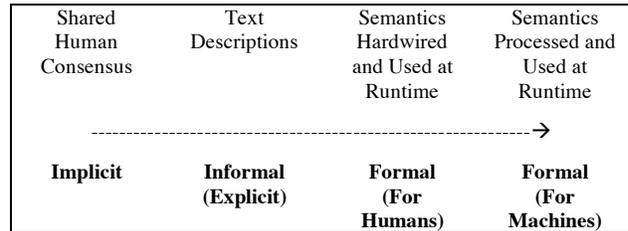
The geographic dispersion of the climate crisis makes transnational communication and intercultural cooperation necessary. Governments, NGOs, non-profit and for-profit organizations of all sizes have roles to play in coordinating the massive and sustained distribution of goods and services to displaced populations. Coordinating their efforts will require the ability to interface with different organizational models (e.g., hierarchical vs. networked) as resources and knowledge move through the human-physical-technological-informational systems. Integrating this variety of information entails more than simply aligning vocabularies and protocols. To make effective decisions in a multicultural environment, the information to be must be translated with appropriate cultural schemas that have meaning for the individuals involved. The challenge of the climate crisis is as much cultural as it is technological.

Statement of research contribution

My research in information science is focused at the nexus of cognition, culture and technology and using ontologies to explore that nexus. I focus on ontologies as manifestations of cultural schemas rather than as expressions of logical formalisms. Such a focus shifts our research perspective from the classical notion of ontology as category disambiguation of classes and instances towards a conceptualization of ontology as an emergent cultural phenomenon. Making such a shift

has significant potential benefits for constructing ontologies for information systems that facilitate semantic interoperability.

Uschold (2003) describes the semantic continuum with implicit semantics that exist as part of a shared human consensus to a formal semantics for machines that processes and uses semantics at runtime, as depicted below:

Shared Human Consensus	Text Descriptions	Semantics Hardwired and Used at Runtime	Semantics Processed and Used at Runtime
--→			
Implicit	**Informal (Explicit)**	**Formal (For Humans)**	**Formal (For Machines)**

Whereas most work on information systems ontologies is focused on transforming text descriptions into logical formalisms for machines, my research is focused on the implicit qualities of ontologies as a shared human consensus. I argue that in order to achieve semantic interoperability, we must devise a way to include and represent the implicit semantics that allows us to communicate with other people. For true semantic interoperability to occur among diverse information systems, within or across domains, information must be contextualized. But attempting to provide a precise description for every possible context and transforming them into logical formalisms is an impossible task because we are trying to crystallize an emergent experience.

To ground this notion of contextualization, I use Heidegger's (1927/1962) notion of *being-in-the-world,* in which each of us is immersed in and never separate from an experiential context. This context is the ever-present background that shapes our semantic and ontological commitments to the world around us--helps us make meaning of what we perceive to exist. Moreover, we are always *being-in-becoming*, experiencing the world as emergent--dynamic, contextualized and with a personal historical perspective. In this way, Heidegger eschews the classical ontology of categorical disambiguation in favor of ontology as an emergent phenomenon. It is this notion of *being-in-becoming* that also allows us to introduce the notion of culture to the study of ontology in information science.

The notion of culture as described by cultural anthropologists (D'Andrade, 1995; Strauss & Quinn,

1997) is remarkably similar to the notions of *being-in-the-world* and *being-in-becoming*. Culture emerges through the interplay of intrapersonal cognitive structures and extrapersonal structures in the world. Culture is a phenomenon integral to our experience and one that shapes our ontological commitments to the world around us. What we presume to exist and the meaning that we make of the world is dependent upon our cultural schemas and experiences. What information is deemed important, how that information is modeled and represented, and how it is presented and displayed is dependent upon the cultural context in which the information system exists and the cultural schemas shared by those developing and using the system. Culture helps to focus our attention on and make meaning of relevant extrapersonal structures and their qualities and dimensions that comprise the context and background of the world. We are always immersed in a cultural experience.

In my research I am investigating how we might use tags and folksonomies as a way of representing and structuring the implicit semantics of our cultural schemas (i.e., shared human consensus) for information system ontologies. I am interested in developing a type of ontology that would complement or supplement the logical machine formalisms and that will allow us to integrate or match the cultural schemas of different cultures to one another, in ways that are meaningful to the persons involved in responding to and managing the humanitarian challenges of the climate crisis.

References

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Biographical Statement

David J. Saab is a PhD candidate at Penn State's College of Information Sciences and Technology. He has a background in philosophy that shapes his interest in the phenomenological analysis of ontology. He has extensive intercultural experience stemming from his early days as a Peace Corps Volunteer in the tiny island nation of the Marshall Islands and working as an intercultural trainer for a large US corporation doing business on Kwajalein Atoll in the Marshall Islands. David formalized his intercultural studies with a master's degree in Intercultural Relations from Lesley University. His master's thesis explored the use of GIS as a cultural tool to capture the ontological commitments of indigenous cultures for their geographic spaces.

David's research in information science focuses on the nexus of cognition, culture and technology. He has worked on a diverse array of projects that include an ethnography of US Marines and their decision-making processes with respect to terrorism mitigation, the development of a formal ontology for military equipment life cycles, the intercultural and interorganizational development of IT capacity for disaster relief among humanitarian organizations and NGOs, and the intercultural dimensions of information fusion among diverse communities and organizations.

Some of his work:

Saab, D.J., Maldonado, E., Orendovici, R., Tchouakeu, L-M, van Gorp, A., Zhao, K., Maitland, C., Tapia, A.H. (2008) "Building global bridges: Coordination bodies for improved information sharing among humanitarian relief agencies," *Proceedings of the 5th International ISCRAM Conference*, F. Fiedrich and B. Van de Walle, (eds.), Washington, DC, USA, May 2008

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Saab, D.J. (*Pending*) "An ethnorelative framework for information systems design," *14th Americas Conference on Information Systems*, 14-17 August 2008, Toronto, Ontario.

Saab, D.J., Tapia, A. Maitland, C.F., VanGorp, A., Maldonado, E., Ngamassi Tchouakeu, L.M., (In progress) "Not at Headquarters: Collaboration and Trust Among IT Field Workers in NGOs Engaged in Humanitarian Relief"

Tapia, A. Maitland, C.F., VanGorp, A., Maldonado, E., Saab, D.J., Ngamassi Tchouakeu, L.M., (In progress) "Information and Organization Coordination between International NGOs engaged in Humanitarian Relief"