Speech Acts, Documents, and Medical Phenomena: An Investigation in the Ontology of Organizations

Lowell Vizenor and Barry Smith
Institute for Formal Ontology and Medical Information Science, University of Leipzig
Department of Philosophy, University at Buffalo, NY

Abstract of a paper to be presented at MEDNET 2003: The 8th Annual World Congress on the Internet and Medicine, Geneva, 4-7 December 2004

Abstract: There are many efforts underway to develop efficient ways of sharing information across healthcare systems and organizations. One spear-heading effort is Health Level 7 (HL7), whose stated mission is: "To provide standards for the exchange, management and integration of data that support clinical patient care and the management, delivery and evaluation of healthcare services." (http://www.hl7.org). Stefanelli (2002) has argued that since HCOs differ with respect to their structure, personnel, resources, etc., it is difficult to share guidelines across systems and organizations. Hence, he argues, guidelines must be combined with models of resources and processes of patient care that are based on a sound ontology of organizations. The present paper outlines the basis of such an organizational ontology, starting out from the ideas in speech act theory central to the HL7 Reference Information Model (RIM). In what follows we apply principles from the philosophical ontology underlying speech act theory to the HL7 RIM, and draw conclusions for an ontology designed to support efficient communication of medical information within and between healthcare organizations.

The HL7 RIM (Version: V 01-22 (2/22/2003)) is a system for the standardized representation of clinical data based on an identification of the life cycle of events that messages or groups of related messages within and between healthcare organizations will carry. Speech acts play a central role in the RIM, since its designers maintain that health care organizations are primarily constituted by "intentional actions, performed and recorded by responsible actors." An Act-Instance is "a record of something that is being done, has been done, can be done, or is intended to be done." No direct reference in the RIM is made to natural events such as a patient's heartbeat. The reason for this is that every Act-Instance must be an act that can be attributed to someone. Thus the natural event of a patient's heartbeat may be recorded as observed, but there is no record of the event itself, independent of the observation of, say, a physician. The relevant record-observation Acts are assigned a mood Code that distinguishes them from records of intended or ordered

services. The latter will standardly progress from defined, through planned and ordered to executed, these successive stages being represented as the mood of the Act.

Following Nolan et al. (1991), the designers of RIM have emphasized the importance of understanding the medical record not as a collection of facts, but as "a faithful record of what clinicians have heard, seen, thought, and done." Acts as statements or speech acts are the only representation of real world facts or processes in the HL7 RIM. The truth about the real world is then constructed through a combination (and arbitration) of such attributed statements only, and there is no class in the RIM whose objects represent "objective states of affairs" or "real processes" independent of attributed statements. As such, there is no distinction between an activity and its documentation. Every Act includes both to varying degrees.

We agree that a healthcare organization can be viewed at one level as a complex of interrelated speech acts through which the actions of organizational agents are coordinated. However, we maintain that an adequate ontology of healthcare organizations should correspond to reality itself in a manner that maximizes descriptive adequacy within the constraints of formal rigor and computational rigor.

As a first step towards such an ontology we draw on the work of the two major founders of speech act theory, namely Austin and Searle, to set forth the division between those provinces of the reality of healthcare organizations which are, and those which are not a part of physical reality but which exist because and to the extent that there are documents that record their existence. Within the context of a healthcare organization, there are documents that record, for example, the existence of an insurance *claim*, a *request* for a medical test, an *obligation* to perform a surgical procedure and so on. The associated claims, requests, and obligations then coincide with no part of physical reality but they serve to hold the organization together as a social object. Abstract entities such as these are brought into existence by the appropriate corresponding speech acts. They are truly such that, as the HL7 RIM might put it, 'there is no distinction between the entity and its documentation'. For other sorts of entities, however, this is not the case. Some social entities such as doctors and clinical wards coincide with physical objects or events and provide the scaffolding which supports those abstract entities that bind together an organization – entities which are not real, but which are yet tied to contexts of human behavior. (Smith 2003, Smith, Searle 2003)

Attempts to develop standards and guidelines for interoperability between healthcare information services will be aided by an ontology of organizations that is maximally representative of organizational reality. The neglect of objective states of affairs and real processes by HL7 RIM – and more generally the neglect of the *context* within which messages are conveyed – places obstacles in the way of an adequate ontology of healthcare organizations of the sort which, as Stefanelli shows, is needed for effective knowledge management. We will show how an ontology can be developed along these lines which can provide an account of social organizations in terms of which efficiency of communication and knowledge management can be enhanced.

(Keywords: Speech Acts, Ontology, HL7 RIM)

Acknowledgements: This work was supported by the Alexander von Humboldt Foundation under the auspices of its Wolfgang Paul Program.

References:

Austin JL: How to do Things with Words. Oxford: Oxford University Press, 1962.

Kumar A., Smith B. , Stefanelli M., Quaglini S., and Piazza M. Implementing Clinical Guidelines in an Organizational Setup. IFOMIS Technical Report http://ontology.buffalo.edu/medo/Functions-Workflow.pdf

Rector AL, Nolan WA, Kay S: Foundations for an electronic medical record. Methods Inf Med, 30 (1991): 179-86.

Searle, JR: 1969 Speech Acts. An Essay in the Philosophy of Language, Cambridge: Cambridge University Press.

Smith, B: John Searle: From Speech Acts to Social Reality, in B Smith (ed.), John Searle, Cambridge: Cambridge University Press, 2003, 1–33.

Smith B, Searle JR: The Construction of Social Reality: An Exchange, American Journal Economics Sociology, 62:2 (2003): 285-309, repr. in L Moss, D Koepsell (eds.), Searle on the Institutions of Social Reality, Oxford: Blackwell, 2003

Stefanelli M. The socio-organizational age of artificial intelligence in medicine. Artificial Intelligence in Medicine 41 (2002): 36-43.