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PANEL 11 ARTIFICIAL INTELLIGENCE AND ORGANIZATION THEORY

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For an organization to function, countless decisions must be made at all levels of the firm. Over time, organizations adapt to internal and external environmental demands and constraints in a manner which yields structures that (should) reduce the complexity of such decision making tasks. What the "appropriate" structures might be and how they might get that way have been, and are continually being, researched and debated as the economic benefits of new technologies often depend on the implementation of a new organizational form. In any event, these structures are comprised of a variety of formal and informal components which are sometimes quite difficult to articulate or explicate and modifications to such structures can lead to unanticipated and possibly undesirable results. The issues addressed by organizational theories are quite relevant to information systems. As our capacity and effort turn to assisting decision makers with information technology, it is essential that we understand and appreciate the interaction between the systems we build and the organizational structures in which we embed them.

Relevant interesting and innovative results are emerging from artificial intelligence (AI) research. These results have (at least) two major implications for information systems and organizational theory. First, as organizations begin to develop and rely upon AI-related technologies, the notion of configuring collections of problem-solving agents, both human and mechanical, offers a powerful form of solution for important classes of problems. The implications of AI technology, its influence and its implementation are important arenas for research. Second, AI concepts afford an innovative approach for developing and researching theories of organizational behavior and design, much as they have revolutionized psychology. By suggesting how a computer could be programmed to reproduce these complex behaviors, AI and cognitive science have furthered our understanding of the underlying processes and given us precise languages for discussing and investigating human behavior and organizational phenomena. This application of ideas from AI to studies of human social systems is an example of the newly viable research paradigm of modeling.

It is likely that this type of research will profoundly affect the practice of IS development. An understanding of how individuals work together provides a principled approach to estimating the specific effects of new information systems on users and may suggest new applications, for example, in the area of computer-supported cooperative work. Furthermore, by systematically exploring the space of possible structures, we may be able to discover new kinds of organizations -- organizations in which humans and computers work in as yet unimagined ways. Of course, the analogy between cognitive psychology and organizational theory is not perfect. Our view is that even simplified models of symbolic processing architectures capable of general intelligence will provide insights of the nature we describe. Some of these views may be controversial, but we believe that this panel will lay a most interesting foundation for discussion and research. Among the key issues for discussion are the following:

1. What are the parallels between development of organizational theory, cognitive psychology, and artificial intelligence?

2. What do we know about potential interactions between information systems and the organization? Should we address AI technologies in different ways?

3. How will AI technologies influence organizational design, structure, and research?

4. Can we have a fruitful search for general principles that apply more generally; for example, in economics to markets and relations between firms; in computer science, to computer systems; in organization behavior, to human groups; and in cognitive psychology, to "societies of the mind"?

Kevin Crowston, Massachusetts Institute of Technology, assisted Michael Prietula in the organization of this panel.