My intention in this white paper is to offer an organizational psychology perspective on the questions of how information technology influences government organizations and how government organizations (and the individuals who people them) influence information technology. Specifically, I’ll use the concept of knowledge management and the multiple ways that term is used by scientists and practitioners to illustrate the importance of considering individual-level as well as organizational- and societal-level dynamics of digital government.

Consider where we’re coming from (or, to a hammer, everything looks like a nail…)

As a social psychologist with strong interdisciplinary interests in cultural anthropology and cognitive psychology, I offer a different perspective on the workshop questions. I want to encourage us to think about the psychological forces driving individuals who work in government as well as the organizations and institutions of governance that shape their behavior. I also want to get us thinking about ourselves as individual researchers – and the ways in which our particular expertise and worldview determines the questions we ask, the tools we use to answer our own questions, and the types of contributions we are uniquely able to make.

This workshop brings together social scientists and practitioners from multiple disciplines and intellectual homes. The individual-level concept I’d like to share first is that of mental models. Our mental models are our beliefs about the way the world works. They determine what we attend to and what we filter out. We tend to trust our mental models at a very deep level, with good reason: they got us where we are today. And they are extremely difficult to change; in fact, we are rarely aware of them.

1 Many of the ideas expressed in this paper were developed in collaboration with Marianne Koch and David Drake; my warmest appreciation goes out to both of them. I also wish to thank Lois Delcambre, Tim Tolle, Len Shapiro, and the whole Forest Research Team at OHSU for their contributions to my knowledge.
So, my first invitation to this group, as we come together “to strengthen our social and applied research capacity in the domain of digital government,” is to reflect on our own mental models, our most deeply held beliefs about the world. What lenses have we been drawn to as ways to understand the world around us? What elements do those lenses filter out?

The Workshop questions reframed from an organizational psychology perspective

Which brings me to our guiding questions for this workshop. The first three questions have a distinctly sociological emphasis on the mutual impact of information technologies and structures, processes, and forms of government organization. We might benefit either from revising the questions themselves to be broader and more inclusive in scope, or from asking similar questions from the vantage point of multiple social science disciplines:

- (Original question) What are the most important impacts of information technologies on the structure and processes of government organizations? Which impacts are already discernible? Which are likely to emerge during the next decade?
- (Organizational psychology version) What are the most important impacts of information technologies on the way work is done in government organizations? What has changed in the experience and effectiveness of individual government workers and managers?
- (Original question) Reversing the causal arrow, how are public managers and policymakers using information technologies to craft new organizational forms or to make important modifications to present forms? What decision making and problem-solving processes are emerging as the principal means of mutual adjustment?
- (Organizational psychology version) Reversing the causal arrow, how has the availability of information technologies changed the nature and content of the work done in government organizations?
- (Original question) What is the impact of increasing use of information-based, networked forms of organization on the institutional structures – for example, oversight, budgeting, accountability systems -- that regulate governance?
- (Organizational psychology version) What is the impact of increasing use of information-based, networked forms of organization on the organizational cultures and norms within government agencies that determine how work is actually done?

Some preliminary perspectives on those individual and cultural relationships between information technology and government organizations can be drawn from recent interviews in my research within the USDA Forest Service. Workers in that agency describe their perception that the pace of work has accelerated. This is part of a pervasive shift in working conditions for knowledge workers in many sectors, whereby supervisors and customers may expect or even demand that knowledge workers offer speedy turnaround time on responding to requests, even though the time to do the knowledge work itself may not be decreased by use of information technologies. For example, Forest Service customers’ expectations of speedy electronic response to Freedom of Information Act requests has changed both the way people do their work and the content of the work itself.
Pressure to deliver certain new electronic forms of work may actually lead to unexpected and undesirable changes in professional practices. For most of the last century, foresters used to go out to analyze a portion of the national forest and develop a “silvicultural prescription,” recommending which forest areas should be harvested in the near term, what maintenance and treatments, such as thinning, would be required in that area of the forest over time, and when the plot would be ready for final harvest. In recent years, the perception is that there is no time to send foresters out to the forest to observe, think about the conditions and what should be done. “Everyone operates as if fighting a forest fire all the time” was the description of the current pace and culture of work offered recently by a Forest Service veteran. Similarly extreme changes in the content of the work done are reflected in only partially facetious remarks about “data-free analysis,” facetiously describing reports written by people who used to have time to do field research and personally gather data to answer questions, who now rely on data from the past and reports from others in writing their current “analysis” of needs.

We also need to recognize and seek to understand the multiple levels at play in the same organizational phenomena. Another example drawn from Forest Service interviews offers the opportunity to look at the interplay between sociological changes in organizational structure and psychological and cultural changes in the way work is experienced and performed. New information technologies appear to be driving a simultaneous shift both in the work being performed (from forestry work to information management work) and in the organizational structure (from highly decentralized, with great discretion at the level of the Regional Forester, to more centralized, with information technology professionals experiencing their “real” boss as the information technology professional up the line from them). The cultural differences between the two professional groups are significant.

The case of knowledge management systems

As a way to address the fourth and fifth Workshop questions (on frameworks and methods for interdisciplinary research), I’d like to shift our focus to the concept of knowledge management, and the design of knowledge management systems. This is a case where the parallel pursuit of research in separate domains without integration has had a severely limiting effect on our collective ability to offer compatible technological and organizational solutions to an important practical problem.

The academic and practitioner literatures on knowledge management are bifurcated between organizational science and information science. On the one side, information scientists develop innovative technologies for capturing and structuring rich, complex data sets and permitting ever-more sophisticated queries of those databases. On the other side, organizational scientists describe the complex contextual understanding and network of relationships that appear to be critical for humans to transform data into information and ultimately knowledge. There is precious little attention focused on the territory between these two domains. The practitioner looking toward academia for applicable knowledge about how to proceed finds only partial solutions.
On the computer science and engineering side, our mental models drive both the development and use of knowledge management technologies. The essence of user needs assessment is to understand as richly as possible the mental models of the future users of the knowledge management system being designed. The users’ mental models will drive whether and how the users will take up the new technology and integrate it into the way they do their work. The challenge then becomes how to design technology that meets users where they are, rather than putting ourselves in their shoes and designing technology that would best suit our needs if we were doing their work (in others words, technology that fits our own mental models).

The mental models driving organizational science perspectives on knowledge management are similarly deterministic of what useful outcomes those perspectives can offer. Perspectives from cognitive, social, and organizational psychology suggest that the cognitive processes involved in transforming data to information to knowledge are complex and difficult to reproduce. Consider the process that an individual might use to write an “expert” analysis for others to reference. The individual’s knowledge has been developed over a period of time in a rich set of contexts. She holds a complex database in her head, from which she can draw relevant concepts and contexts to help make sense of and illuminate new data. This context is what enables her to turn new bits of experience into coherent ideas (data into information, in Turing’s words), and ultimately to turn ideas into a form where she can take action on them (information into knowledge).

But when she is asked to crystallize her complex understanding into a document, her knowledge loses important elements of its context and thus its meaning. Furthermore, what was knowledge for her will become data for the person who reads it in a written form separated from the author’s contextual understanding. Readers bring their own context to the words the expert has written, and sense of the document in the context of their own experiences. This dilemma of knowledge becoming mere data again by being separated from its context is critically important to the future of knowledge management systems.

**Reflections of an allegedly interdisciplinary researcher**

I’d like to share a recent personal experience as a way of reflecting on the enormity of the challenge of doing research that integrates social science and information science perspectives. I’m part of a multi-disciplinary team working to develop a forest information portal that might someday address the needs of three federal agencies. (These three agencies have somewhat contradictory, somewhat overlapping jurisdictions over our federal forest lands, and the precise role the portal will play in meeting their knowledge management needs is still under development… but that’s a different story.)

Our team includes faculty and students from three academic departments: Computer Science and Engineering, Environmental Science and Engineering, and Management in Science and Technology, together with our project-co-director from the Forest Service, a forestry information consultant who helped initiate the project, and participants from other agencies and universities. Our custom is to have a working lunch together once a
month or so, to keep each other posted on what progress we’ve made on our various parts of the whole.

A new member of our team, Len, a computer scientist from a nearby university, came to lunch for the first time last month. After a brief conversation with me and a somewhat longer conversation with Shawn, the computer scientist sitting on the other side of him, he turned to me and asked me if I study knowledge management. I, perhaps foolishly, said yes. He then asked me if I knew about the “superimposed schematics” approach that Shawn was working on.

Here’s the embarrassing part. I didn’t. I knew that he and the other computer scientists on our team were working on various technical means to help future users of our portal be able to search for and find research reports and other documents that would be highly relevant to their management and policy decisions. But that wasn’t what Len meant.

And I know and like Shawn. I’ve conversed with him on different topics over the year we’ve worked together, and I enjoy talking to him. But I’d never really asked, and he’d never really offered, the details of the approach he’s using on our project.

Len didn’t leave it at that. He educated me with a few sentences and quick examples the core idea of “superimposed schematics”, and then went on to describe that concept’s similarity with his own work on “data warehousing” and “data mining.” And then he asked me another question: “What do you call that in knowledge management?”

In his first ten minutes of our meeting, Len built the scaffolding of a bridge. Before our conversation I felt proud of my role in our multidisciplinary team, where we all were cooperatively working on adjacent parts of the whole. But Len’s questions upped the ante for me. In a few short minutes I felt not only embarrassed by my prior lack of curiosity, but I felt a genuine desire to learn more about the details of what my computer science and environmental science colleagues were doing. What contributions to practice might we be able to make if we truly became an interdisciplinary team?? Moreover, what contributions to the practice of scientific research might we be able to make if we honestly examined our own experiences as members of the team? What would it take to bridge the gulfs between us?

Add to this the complexities within each domain, and the different words we invent to describe the nuances of our particular focus on our particular slice of the complex whole. So, Len’s work on “data mining” may turn out to be quite relevant to Shawn’s work on “superimposed schematics”, but if they don’t compare notes they may work in parallel with one another and never benefit from (or be in a position to integrate with) each others’ work. And the translation of those terms into knowledge management lingo is even more challenging, as is the underlying integration of the work. This brings us back to Len’s question, “What do you call that in knowledge management?” There was no simple answer.
From the outside, one might imagine that social and organizational scientists would escape this problem, at least in our cross-disciplinary work with one another. But we don’t. We have developed our own languages within each social science discipline. This puts us at risk of only being able to communicate with the narrow group of others who have similar academic training.

The language and paradigms we bring from our disciplines also determine which aspects of the complex organizational reality of government we study, and which we leave unexplored. Again, this is human – our brains cannot process all dimensions of complex terrain at once, and so we focus only on dimensions that our theories lead us to believe will be most useful. But many aspects of human behavior do not yield to this cross-sectioning without a significant loss of richness and relevance.

So what? (or what next?)

As a newcomer to the study of public sector organizations and to the domain of knowledge management, I hope to follow in the footsteps of my colleague Len by asking basic questions and offering translations of my own discipline’s concepts. My goal is to move us toward an integrated approach to knowledge management, with sufficient robustness to be a valuable guide to our knowledge management practices in the public and private sectors. Furthermore, by making our mental models explicit and examining our own practices within our research teams, we can work consciously to achieve greater integration and collaboration across academic disciplines. Such efforts have the potential to improve the usefulness of our results for public sector managers working with new information technologies within and across government organizations.