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Towards a Typology of Knowledge Work

by Jim Ware and Charlie Grantham

Last month our feature article revisited an old but important question: “What is a Knowledge Worker, Anyway?” That article was an excerpt from a working paper we prepared as part of our work on the West Michigan WIRED project, which we have previously described several times.

This month we continue our focus on understanding knowledge work and knowledge workers by including another excerpt from that same WIRED working paper. After the opening general discussion about knowledge workers, we discussed the nature of work itself. The themes are similar, but approaching the question by dissecting the kind of tasks that knowledge workers typically do brings new perspective and new insights into the conversation.

Our primary objective has been to develop a way to determine whether a given task, or job, could be effectively transitioned from a traditional work environment (read, “corporate office”) to a more distributed situation – whether an individual should be a candidate for home-based work, or at least a more flexible work arrangement that is more “location-independent.”

Research conducted by the Work Design Collaborative over the past five years suggests that there are at least seven important dimensions of work activity that have an impact on where, when, and how that work can be accomplished:

Purpose – *whether the task involves applying existing knowledge to a well-defined problem, or generating new knowledge.*

Process Structure – *the extent to which the knowledge required to complete the task is known and codified in advance or is being created as needed, drawing on the individual’s experience, intuition and creativity.*

Outcome Structure – *the extent to which the outcome(s) of the work activity are known, predictable, and controllable. As will be described below, work tasks can be aligned along a spectrum from “production” work in which the work products are well-defined and highly uniform, to “research” and creative tasks in which the outcomes are unknown in advance.*

Interactivity – *the extent and type of interaction involved in the normal conduct of the work. Is it done primarily by an individual, or through interaction with others (whether fellow employees or “outsiders” like customers, suppliers, government representatives, or other interested parties).*

Place – *whether the work is tied to a specific place like a laboratory, a geographic location, or a particular work facility, or can be carried out in many different places.*

Proximity – *must the work be co-located with other specific tasks (and the people doing them), or can it be carried out in a distributed environment?*

Time – *when the task is accomplished, or must be accomplished, and in particular how it relates to other tasks; must it be carried out simultaneously with other tasks, or can they be completed asynchronously?*

In combination, these seven dimensions of work activity create a complex variety of differing task configurations. Together they affect information and communications support requirements, and they define the technologies, facilities, and skills that are needed for workers and teams to be effective and productive.

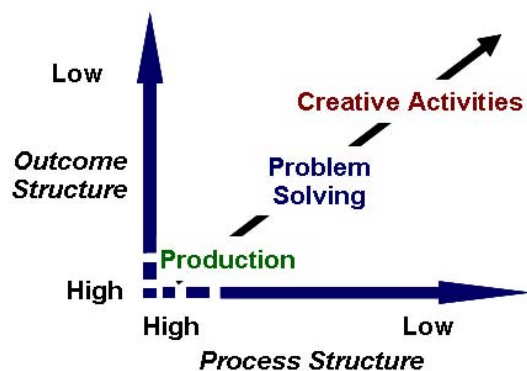
To simplify this admittedly complex analysis, we have found it helpful to distill these seven broad attributes of work into three primary categories of knowledge activity that affect whether and how that work could (or should) be distributed over time and space:

1. The degree of *structure* in the work and its outcomes
2. The *type* of knowledge produced, and the way it is *used*
3. The extent to which the work is *individual* or *collaborative*

A complete analysis of a work environment will also take into account place, proximity, and time, but those factors (and their implications for distributed work) are much simpler to measure. Thus here we focus on structure, type of knowledge produced, its intended uses, and the degree of interactivity that is inherent in the tasks.

We have found the following diagram (Figure One) a useful way to describe these dimensions of work.

Figure One: Three Kinds of Work



The questions are, first, how predictable, or structured, are the *outcomes* of the work activity; and, second, how structured, or well-defined are the *activities* or processes that produce those outcomes?

If both the processes and the results are highly structured, it's "production work." There are certainly many organizational tasks that, even though they are very information-intensive, are essentially production work. For example, many call center jobs, accounting tasks, payment processing jobs, and even some technical support jobs are relatively routine activities that would actually decline in quality if the individuals doing them were to act creatively and deviate from prescribed procedures.

On the other hand, if both the task outcomes and the processes used to produce those outcomes are very loosely structured, it is creative work, or perhaps even research. And if the results are moderately structured, and generated by moderately structured processes, we call it "problem-solving." For example, a majority of technical support jobs involve a high degree of problem-solving. There is a reasonably well-defined outcome (though it will be different for each customer the tech support person responds to), and there are some known diagnostic questions or processes that guide the problem-solving, but each case is unique. The tech support person doesn't know until he or she picks up the telephone what problem needs solving.

This typology is useful because it provides guidelines about how to manage differing kinds of work (and in particular to highlight how the management challenges increase when these activities are distributed). For example, all the work over the last decade or two about Quality Control and Six Sigma is all about removing variations, or unpredictability, from production work.

However, we have come to realize that there is actually more structure, or discipline, in a lot of creative work, than Figure One implies (See, for example, "[The Three D's of Creativity](#)," Nancy Napier's article from *Future of Work Agenda* in March, 2005). Some

structure is necessary to guide and focus creative work, or you end up with chaos. But, that said, creative work is clearly a different beast than production work.

And that's a big reason why it can be so difficult to manage creative work and creative workers, especially when they are remote, mobile, or highly distributed. As we've said many times, you can't order up a "batch of creativity" to be delivered at precisely 10 AM on Wednesday morning the way you can produce well-defined widgets coming off an assembly line.

How Interactive is the Work?

As noted earlier, some tasks are primarily individual in nature, while others are highly interactive. Many activities, like copywriting, programming, graphic design, and legal research, are "heads down" individual tasks that require only periodic interaction with others.

Other organizational roles, however, typically require extensive interaction, sometimes with the same people (e.g., team members, supervisors, peers) and sometimes with an ever-changing mix of others (e.g., customers, suppliers, public officials, etc). Each of these activities has a different pattern of interaction and mobility, resulting in different needs for physical and IT support.

Distributed knowledge workers whose jobs require interaction with others must rely on electronic media and postal and delivery services when they have to communicate, or on travel when it is necessary to meet face to face. In fact, many interactions are just as effective – and often actually more productive – when they take place electronically.

For many issues a telephone call can actually accomplish the required information exchange far more quickly than a face-to-face conversation. While informal social conversation is just as common in telephone calls as it is in face-to-face interaction, there is typically a good deal less of it – and of course it takes much less time to dial a phone number than it does to travel to another person's office or another city.

What makes this dimension of interactivity complex is something we all know intuitively: some kinds of interaction work just as effectively at a distance as they do in a face-to-face context, while in other cases the difference in quality between face-to-face and remote interaction can be profound. We're all accustomed to interacting with many kinds of customer service representatives, airline reservations agents, and even business colleagues by telephone or even email. But few of us would be happy participating in a personal counseling session, a medical examination, or a performance review over the telephone.

Dissecting knowledge work (and understanding knowledge workers) is clearly not a simple task. We can't produce a simple set of diagnostic questions that will reliably classify a given job as knowledge-based, or as amenable to being carried out remotely or in a mobile context. Judgment will always be required, as well as taking into account the individual motivations and values of the knowledge workers themselves.

This discussion has focused primarily on the *tasks* that knowledge workers carry out in their work. But we would be remiss if we didn't also acknowledge that one critical characteristic of knowledge work is that it is conducted by human beings – individuals who have distinctive work styles and preferences for where, when, and how they get their work done. Most knowledge-based work can follow many different paths to the same end point. Thus human judgment, including that of the individuals who are actually doing the work, is an important and indispensable component of the work design process.

It may ultimately be impossible to develop an “objective” diagnostic tool that will reliably separate knowledge work activities into those requiring proximity and those that are location-neutral. Individual preferences, the nature of the activities in question, and managerial judgment remain important components of the analysis.

As usual, your comments and reactions are more than welcome. And as always, please send your thoughts to us at comments@thefutureofwork.net.

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